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Date: APR 3 0 2019
Refer To: N3B-19-0114

Nicholas Schiavo, Water Division Director
Sangre de Cristo Water Division
City of Santa Fe
801 West San Mateo, P.O. Box 909
Santa Fe, New Mexico 87504

Subject: Los Alamos National Laboratory Sitewide Monitoring Program, City of Santa Fe Buckman Water Supply Wells, 2019–2020 Sampling and Analysis Plan

Dear Mr. Schiavo:

The City of Santa Fe Buckman water supply wells have been sampled since 2001 for both general characterization and specific constituents of interest under Los Alamos National Laboratory's Sitewide Monitoring Program. These wells include Buckman 1, Buckman 6, Buckman 8, SF-3A, and SF-4A.

The U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office (EM-LA) and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) continue to coordinate with the City of Santa Fe to conduct an annual review of the sampling and analysis plan (SAP) to ensure it is dynamic, strategic, and mutually beneficial.

The attached 2019–2020 SAP represents the sampling and analysis commitment for the period from April 1, 2019, to March 31, 2020. Sampling for this period will begin in June 2019. The sampling suites and methods in this SAP are the same as those used for sampling of groundwater monitoring wells under the New Mexico Environment Department–approved Interim Facility-Wide Groundwater Monitoring Plan.

N3B will continue to implement the following practices associated with groundwater data collected from Buckman water supply wells.

1. N3B will provide an automated report of the data upon receipt from the analytical laboratory. Sixty days after the automated report is provided to the City of Santa Fe, the data will be posted to the publicly accessible website, Intellus (http://www.intellusnm.com).
2. If a potential contaminant is detected in a Buckman production well, N3B will work with the City of Santa Fe Sangre de Cristo Water Division to evaluate the data and review the need to

modify the SAP, and/or to collect additional samples to address questions raised by the potential contaminant as deemed necessary.

The attached 2019–2020 SAP is consistent with the previous SAP, with the exceptions of the following updates to Tables 1 and 2:

1. Per- and polyfluoroalkyl substances (PFAS) analyses have been added to Table 1 for Quarter 3 to reflect requirements for new toxic pollutants under 20.6.2 New Mexico Administrative Code (NMAC). PFAS sampling comprises perfluorooctanoic acid, perfluorooctane sulfate, and perfluorohexane sulfonic acid.
2. Table 2 has been revised to include the following information for PFAS analysis: analytical suite, analytical group, field preparation, analytical method and analytes.
3. Sulfolane and prometon sampling is included in Table 3 as part of the semivolatile organic compound analytical suite (subject to change based on analytical laboratory contracts). Sampling for these analytes will occur at the water supply wells to reflect requirements for new toxic pollutants under 20.6.2 NMAC.

N3B will continue to follow the historical practice of providing the City of Santa Fe with a 60-day review period before water supply well data are released to the public or posted to the publicly accessible website, Intellus (http://www.intellusnm.com).

If you have any questions, please contact Steve Veenis at (505) 309-1362 (steve.veenis@em-la.doe.gov) or David Rhodes at (505) 665-5325 (david.rhodes@em.doe.gov).

Sincerely,

Frazer Lockhart
Program Manager
Regulatory and Stakeholder Interface
N3B-Los Alamos

Sincerely,

David S. Rhodes, Director
Office of Quality and Regulatory Compliance
Environmental Management
Los Alamos Field Office

Enclosure(s): Los Alamos National Laboratory Sitewide Monitoring Program, City of Santa Fe Buckman Water Supply Wells, 2019–2020 Sampling and Analysis Plan (EM2019-0143)

Cy: (letter and enclosure[s] emailed)
Laurie King, EPA Region 6
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Public Reading Room (EPRR)
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Los Alamos National Laboratory Sitewide Monitoring Program, City of Santa Fe Buckman Water Supply Wells, 2019–2020 Sampling and Analysis Plan

Table 1
Sampling and Analysis Plan for the City of Santa Fe
Buckman Water Supply Wells for the Period of April 1, 2019, to March 31, 2020

Location	Analytical Suites[a]											
	Metals		Organics				Radionuclides		Inorganics			
	Metals	Hexavalent Chromium	VOCs[b]	SVOCs[c]	PCBs[d]	HEXP[e]	Radionuclides	Low-Level Tritium	General Inorganics	Nitrate+nitrite	Perchlorate	PFAS[f]
Buckman No. 1	Q3, Q1	Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	—[g]	—	Q3
Buckman No. 6	Q3, Q1	Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	—	—	Q3
Buckman No. 8	Q3, Q1	Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	Q3, Q1	—	—	Q3
SF-3A	—	Q1	—	—	—	—	—	Q1	—	Q1	Q1	Q3
SF-4A	—	Q1	—	—	—	—	—	Q1	—	Q1	Q1	Q3

Notes: Sampling schedule: Quarter 3 (Q3) = Apr–Jun 2019; Q4 = Jul–Sep 2019; Q1 = Oct–Dec 2019; Q2 = Jan–Mar 2020.
Quality control samples will be collected in accordance with Appendix D of the Interim Facility-Wide Groundwater Monitoring Plan for the associated monitoring year.

[a] Table 2 of this sampling and analysis plan presents the analytical groups, sample field preparation, analytical methods, and analytes for the analytical suites specified in Table 1.

[b] VOCs = Volatile organic compounds.

[c] SVOCs = Semivolatile organic compounds.

[d] PCBs = Polychlorinated biphenyls.

[e] HEXP = High explosives.

[f] PFAS = Per- and polyfluoroalkyl substances. PFAS sampling comprises perfluorooctanoic acid, perfluorooctane sulfate, and perfluorohexane sulfonic acid.

[g] This analytical suite is not scheduled to be collected for this location.

Table 2
Analytes, Field Preparation, and Analytical Methods Used by the
U.S. Environmental Protection Agency Contract Laboratory Program Laboratories for
Samples Collected under the Sampling and Analysis Plan for the City of Santa Fe Water Supply Wells

Analytical Suite	Analytical Group	Field Preparation	Analytical Method	Analytes
Metals	WSP-All Metals	Filtered	SM:A2340	Hardness
			SW-846:6010	Aluminum, barium, beryllium, boron, calcium, cobalt, copper, iron, magnesium, manganese, potassium, silicon dioxide, sodium, strontium, tin, vanadium, zinc
			SW-846:6020	Antimony, arsenic, cadmium, chromium, lead, molybdenum, nickel, selenium, silver, thallium, uranium
			EPA:245.2	Mercury
	MSGP-Hg	Unfiltered	EPA:245.2	Mercury
Hexavalent Chromium	WSP-HexCr	Unfiltered	EPA:218.7	Hexavalent chromium
VOCs[a]	WSP-8260B-VOA	Unfiltered	SW-846:8260	See Table 3
SVOCs[b]	WSP-8270C-SVOA	Unfiltered	SW-846:8270	See Table 3
PCBs[c]	WSP-8082-PCB	Unfiltered	SW-846:8082	See Table 3
HEXP[d]	WSP-8330B-NMED HEXP	Unfiltered	SW-846:8330B	See Table 3
Radionuclides	WSP-GrossA/B	Unfiltered	EPA:900	Gross alpha, gross beta
	WSP-RAD	Unfiltered	EPA:901.1	Cesium-137, cobalt-60, neptunium-237, potassium-40, sodium-22
			EPA:905.0	Strontium-90
			HASL-300:AM-241	Americium-241
			HASL-300:ISOPU	Plutonium-238, plutonium-239/240
			HASL-300:ISOU	Uranium-234, uranium-235/236, uranium-238
	Ra-226+228	Unfiltered	EPA:903.1	Radium-226
			EPA:904	Radium-228
Low-Level Tritium	WSP-LL-H-3	Unfiltered	Generic:Low_Level_Tritium	Tritium
General Inorganics	WSP-GENINORG+ Perchlorate	Filtered	EPA:120.1	Specific conductance
			EPA:150.1	Acidity or alkalinity of a solution
			EPA:160.1	Total dissolved solids
			EPA:300.0	Bromide, chloride, fluoride, sulfate
			EPA:310.1	Alkalinity-CO_3, Alkalinity-CO_3 + HCO_3
			SW-846:6010	Silicon dioxide
			SW-846:6850	Perchlorate

Table 2 (continued)

Analytical Suite	Analytical Group	Field Preparation	Analytical Method	Analytes
General Inorganics (cont.)	WSP-NH_3+NO_3/NO_2+ PO_4	Filtered	EPA:350.1	Ammonia as nitrogen
			EPA:353.2	Nitrate-nitrite as nitrogen
			EPA:365.4	Total phosphate as phosphorus
	WSP-TKN+TOC	Unfiltered	EPA:351.2	Total Kjeldahl nitrogen
			SW-846:9060	Total organic carbon
	WSP-CN(T)	Unfiltered	EPA:335.4	Cyanide (Total)
PFAS[e]	PFAS subset	Unfiltered	EPA 537.1 Modified[f]	Perfluorooctanoic acid
	PFAS subset	Unfiltered	EPA 537.1 Modified[f]	Perfluorooctane sulfate)
	PFAS subset	Unfiltered	EPA 537.1 Modified[f]	Perfluorohexane sulfonic acid

[a] VOCs = Volatile organic compounds.

[b] SVOCs = Semivolatile organic compounds.

[c] PCBs = Polychlorinated biphenyls.

[d] HEXP = High explosives.

[e] PFAS = Per- and polyfluoroalkyl substances.

[f] Will be determined when contract with analytical laboratory has been established.

Table 3
Analytical Methods Used by
Contract Laboratories for Samples Collected under
the Sampling and Analysis Plan for the City of Santa Fe Water Supply Wells

Symbol or CAS[a] No.	Analyte
Analytical Suite: VOCs[b] **Analytical Group: WSP-8260B-VOA** **Analytical Method: SW-846:8260**	
67-64-1	Acetone
75-05-8	Acetonitrile
107-02-8	Acrolein
107-13-1	Acrylonitrile
71-43-2	Benzene
108-86-1	Bromobenzene
74-97-5	Bromochloromethane
75-27-4	Bromodichloromethane
75-25-2	Bromoform
74-83-9	Bromomethane
71-36-3	Butanol[1-]
78-93-3	Butanone[2-]
104-51-8	Butylbenzene[n-]

Table 3 (continued)

Symbol or CAS No.	Analyte
135-98-8	Butylbenzene[sec-]
98-06-6	Butylbenzene[tert-]
75-15-0	Carbon disulfide
56-23-5	Carbon tetrachloride
126-99-8	Chloro-1,3-butadiene[2-]
107-05-1	Chloro-1-propene[3-]
108-90-7	Chlorobenzene
124-48-1	Chlorodibromomethane
75-00-3	Chloroethane
67-66-3	Chloroform
74-87-3	Chloromethane
95-49-8	Chlorotoluene[2-]
106-43-4	Chlorotoluene[4-]
96-12-8	Dibromo-3-Chloropropane[1,2-]
106-93-4	Dibromoethane[1,2-]
74-95-3	Dibromomethane
95-50-1	Dichlorobenzene[1,2-]
541-73-1	Dichlorobenzene[1,3-]
106-46-7	Dichlorobenzene[1,4-]
75-71-8	Dichlorodifluoromethane
75-34-3	Dichloroethane[1,1-]
107-06-2	Dichloroethane[1,2-]
75-35-4	Dichloroethene[1,1-]
540-59-0	Dichloroethene[cis/trans-1,2-]
156-59-2	Dichloroethene[cis-1,2-]
156-60-5	Dichloroethene[trans-1,2-]
78-87-5	Dichloropropane[1,2-]
142-28-9	Dichloropropane[1,3-]
594-20-7	Dichloropropane[2,2-]
563-58-6	Dichloropropene[1,1-]
10061-01-5	Dichloropropene[cis-1,3-]
10061-02-6	Dichloropropene[trans-1,3-]
60-29-7	Diethyl ether
123-91-1	Dioxane[1,4-]
97-63-2	Ethyl methacrylate
100-41-4	Ethylbenzene
87-68-3	Hexachlorobutadiene
591-78-6	Hexanone[2-]
74-88-4	Iodomethane
78-83-1	Isobutyl alcohol

Table 3 (continued)

Symbol or CAS No.	Analyte
98-82-8	Isopropylbenzene
99-87-6	Isopropyltoluene[4-]
126-98-7	Methacrylonitrile
80-62-6	Methyl methacrylate
1634-04-4	Methyl tert-Butyl Ether
108-10-1	Methyl-2-pentanone[4-]
75-09-2	Methylene chloride
91-20-3	Naphthalene
107-12-0	Propionitrile
103-65-1	Propylbenzene[1-]
100-42-5	Styrene
630-20-6	Tetrachloroethane[1,1,1,2-]
79-34-5	Tetrachloroethane[1,1,2,2-]
127-18-4	Tetrachloroethene
108-88-3	Toluene
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]
87-61-6	Trichlorobenzene[1,2,3-]
120-82-1	Trichlorobenzene[1,2,4-]
71-55-6	Trichloroethane[1,1,1-]
79-00-5	Trichloroethane[1,1,2-]
79-01-6	Trichloroethene
75-69-4	Trichlorofluoromethane
96-18-4	Trichloropropane[1,2,3-]
95-63-6	Trimethylbenzene[1,2,4-]
108-67-8	Trimethylbenzene[1,3,5-]
108-05-4	Vinyl acetate
75-01-4	Vinyl chloride
95-47-6	Xylene[1,2-]
Xylene[m+p]	Xylene[1,3-]+Xylene[1,4-]
Analytical Suite: SVOCs[c] **Analytical Group: WSP-8270C-SVOA** **Analytical Method: SW-846:8270**	
83-32-9	Acenaphthene
208-96-8	Acenaphthylene
62-53-3	Aniline
120-12-7	Anthracene
1912-24-9	Atrazine
103-33-3	Azobenzene
92-87-5	Benzidine
56-55-3	Benzo(a)anthracene

Table 3 (continued)

Symbol or CAS No.	Analyte
50-32-8	Benzo(a)pyrene
205-99-2	Benzo(b)fluoranthene
191-24-2	Benzo(g,h,i)perylene
207-08-9	Benzo(k)fluoranthene
65-85-0	Benzoic acid
100-51-6	Benzyl alcohol
111-91-1	Bis(2-chloroethoxy)methane
111-44-4	Bis(2-chloroethyl)ether
117-81-7	Bis(2-ethylhexyl)phthalate
101-55-3	Bromophenyl-phenylether[4-]
85-68-7	Butylbenzylphthalate
59-50-7	Chloro-3-methylphenol[4-]
106-47-8	Chloroaniline[4-]
91-58-7	Chloronaphthalene[2-]
95-57-8	Chlorophenol[2-]
7005-72-3	Chlorophenyl-phenyl[4-] Ether
218-01-9	Chrysene
53-70-3	Dibenz(a,h)anthracene
132-64-9	Dibenzofuran
95-50-1	Dichlorobenzene[1,2-]
541-73-1	Dichlorobenzene[1,3-]
106-46-7	Dichlorobenzene[1,4-]
91-94-1	Dichlorobenzidine[3,3'-]
120-83-2	Dichlorophenol[2,4-]
84-66-2	Diethylphthalate
131-11-3	Dimethyl phthalate
105-67-9	Dimethylphenol[2,4-]
84-74-2	Di-n-butylphthalate
534-52-1	Dinitro-2-methylphenol[4,6-]
51-28-5	Dinitrophenol[2,4-]
121-14-2	Dinitrotoluene[2,4-]
606-20-2	Dinitrotoluene[2,6-]
117-84-0	Di-n-octylphthalate
88-85-7	Dinoseb
123-91-1	Dioxane[1,4-]
122-39-4	Diphenylamine
206-44-0	Fluoranthene
86-73-7	Fluorene
118-74-1	Hexachlorobenzene
87-68-3	Hexachlorobutadiene

Table 3 (continued)

Symbol or CAS No.	Analyte
77-47-4	Hexachlorocyclopentadiene
67-72-1	Hexachloroethane
193-39-5	Indeno(1,2,3-cd)pyrene
78-59-1	Isophorone
90-12-0	Methylnaphthalene[1-]
91-57-6	Methylnaphthalene[2-]
95-48-7	Methylphenol[2-]
106-44-5	Methylphenol[4-]
91-20-3	Naphthalene
88-74-4	Nitroaniline[2-]
99-09-2	Nitroaniline[3-]
100-01-6	Nitroaniline[4-]
98-95-3	Nitrobenzene
88-75-5	Nitrophenol[2-]
100-02-7	Nitrophenol[4-]
55-18-5	Nitrosodiethylamine[N-]
62-75-9	Nitrosodimethylamine[N-]
924-16-3	Nitroso-di-n-butylamine[N-]
621-64-7	Nitroso-di-n-propylamine[N-]
86-30-6	Nitrosodiphenylamine[N-]
930-55-2	Nitrosopyrrolidine[N-]
108-60-1	Oxybis(1-chloropropane)[2,2'-]
608-93-5	Pentachlorobenzene
87-86-5	Pentachlorophenol
85-01-8	Phenanthrene
108-95-2	Phenol
129-00-0	Pyrene
110-86-1	Pyridine
95-94-3	Tetrachlorobenzene[1,2,4,5]
58-90-2	Tetrachlorophenol[2,3,4,6-]
120-82-1	Trichlorobenzene[1,2,4-]
95-95-4	Trichlorophenol[2,4,5-]
88-06-2	Trichlorophenol[2,4,6-]
TBD[d]	Prometon
TBD	Sulfolane (tholane 1,1-dioxide)

Table 3 (continued)

Symbol or CAS No.	Analyte
Analytical Suite: PCBs[e] **Analytical Group: WSP-8082-PCB** **Analytical Method: SW-846:8082**	
12674-11-2	Aroclor-1016
11104-28-2	Aroclor-1221
11141-16-5	Aroclor-1232
53469-21-9	Aroclor-1242
12672-29-6	Aroclor-1248
11097-69-1	Aroclor-1254
11096-82-5	Aroclor-1260
37324-23-5	Aroclor-1262
Analytical Suite: HEXP[f] **Analytical Group: WSP-8330B-NMED HEXP** **Analytical Method: SW-846:8330B**	
6629-29-4	Diamino-6-nitrotoluene[2,4-]
59229-75-3	Diamino-4-nitrotoluene[2,6-]
618-87-1	Dinitroaniline[3,5-]
19406-51-0	Amino-2,6-dinitrotoluene[4-]
35572-78-2	Amino-4,6-dinitrotoluene[2-]
99-65-0	Dinitrobenzene[1,3-]
121-14-2	Dinitrotoluene[2,4-]
606-20-2	Dinitrotoluene[2,6-]
2691-41-0	HMX[g]
98-95-3	Nitrobenzene
88-72-2	Nitrotoluene[2-]
99-08-1	Nitrotoluene[3-]
99-99-0	Nitrotoluene[4-]
78-11-5	PETN[h]
121-82-4	RDX[i]
3058-38-6	TATB[j]
479-45-8	Tetryl

Table 3 (continued)

Symbol or CAS No.	Analyte
99-35-4	Trinitrobenzene[1,3,5-]
118-96-7	Trinitrotoluene[2,4,6-]
78-30-8	Tris (o-cresyl) phosphate

Note: Table 3 is referenced in Table 2 and serves to complete the analyte lists in Table 2.

[a] CAS= Chemical Abstracts Service.

[b] VOCs = Volatile organic compounds.

[c] SVOCS = Semivolatile organic compounds.

[d] To be determined (TBD) pending laboratory contracts; and subject to change.

[e] PCB = Polychlorinated biphenyl.

[f] HEXP = High explosives.

[g] HMX = Her Majesty's Explosive.

[h] PETN = Pentaerythritol tetranitrate.

[i] RDX = Royal Demolition Explosive.

[j] TATB = Triaminotrinitrobenzene.

Pamela T. Maestas

From:	Pamela T. Maestas
Sent:	Tuesday, April 30, 2019 2:16 PM
To:	'naschiavo@santafenm.gov'
Cc:	William Alexander; Lori Huntoon; Steve J. Veenis
Subject:	LANL Sitewide Monitoring Program, City of Santa Fe Buckman Water Supply Wells, 2019–2020 SAP
Attachments:	N3B-19-0114_2019-2020_SF_Buckman_SAP_043019.pdf
Importance:	High

Mr. Schiavo,
Attached is the "Los Alamos National Laboratory Sitewide Monitoring Program, City of Santa Fe Buckman Water Supply Wells, 2019–2020 Sampling and Analysis Plan."
You will also receive a hard copy of the SAP by mail.
Please acknowledge receipt of this email by replying to all.
Thank you.

Pamela T. Maestas
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