



N3B-Los Alamos
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 Los Alamos, New Mexico 87544
 (505) 257-7690



Environmental Management
 Los Alamos Field Office
 1200 Trinity Drive, Suite 400
 Los Alamos, New Mexico 87545
 (240) 562-1122

Date: January 31, 2024
Refer To: N3B-2024-0002

Clay Moseley, Deputy Utility Manager
 Gas, Water, and Sewer Services
 Los Alamos County
 1000 Central Avenue, Suite 130
 Los Alamos, NM 87544

Subject: Los Alamos National Laboratory Site-Wide Monitoring Program, Los Alamos County Water Supply Wells, 2024 Sampling and Analysis Plan

Dear Mr. Moseley:

Water supply wells in Los Alamos County (the County) are routinely sampled for both general characterization and specific constituents of interest under Los Alamos National Laboratory's Site-Wide Monitoring Program. These wells include G-2A, G-3A, G-4A, G-5A, O-1, O-2, O-4, PM-1, PM-2, PM-3, PM-4, and PM-5.

The U.S. Department of Energy Environmental Management Los Alamos Field Office (EM-LA) and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) continue to coordinate with the County to conduct an annual review of the sampling and analysis plan (SAP).

The enclosed 2024 SAP illustrates the next four quarters of the County sampling calendar (January 1, 2024, to December 31, 2024). The sampling suites and methods in this SAP are the same as those applied to the 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 sampling and evaluation of data collected from County water supply wells.

1. N3B will follow the SAP to conduct sampling using the N3B groundwater sampling standard operating procedure for water supply wells (N3B-SOP-ER-3003, Revision 2), which incorporates best industry practices.
2. Upon receipt of data from the analytical laboratory, N3B will submit an automated data report to the County. Sixty days after submittal of the automated report, the data will be posted to the publicly accessible website Intellus New Mexico (<http://www.intellusnm.com>).

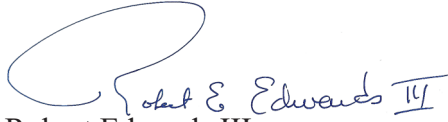
3. If a new contaminant is detected in a County well, EM-LA and N3B will (1) work with County Water Utilities to evaluate the data and (2) review the need to modify the SAP and/or to collect additional samples to address questions raised by the potential contaminant.

The enclosed 2024 SAP is consistent with the 2023 SAP. Sampling will be conducted on a monthly, quarterly, and semiannual basis. Sampling at new production well Otowi-2 (O-2) will include two rounds of both per- and polyfluoroalkyl substances (PFAS) and polychlorinated biphenyls (PCBs). With the exception of production well O-2, two rounds of PFAS and PCB sampling have been completed in previous years at the County's water supply wells. Because there were no detections during sampling, PFAS and PCBs were removed from the SAP for these locations. Two rounds of PFAS and PCB sampling will be completed at O-2; if no detections of these compounds are found to exceed New Mexico Water Quality Control Commission regulatory standards, PFAS and PCB sampling for O-2 will be removed from the 2025 SAP.

Additionally, production well PM-3 has not been sampled as planned because of a mechanical issue. N3B will conduct sampling according to the SAP once the location is online.

If you have any questions, please contact Amanda White at (505) 309-1366 (amanda.white@em-la.doe.gov) or Susan Wacaster at (505) 709-8704 (susan.wacaster@em.doe.gov).

Sincerely,



Robert Edwards III
Acting Program Manager
Environment, Safety, Health and Quality
N3B-Los Alamos

Sincerely,



Digitally signed by Brian G.
Harcek
Date: 2024.01.30 15:46:03 -07'00'

Brian Harcek, Acting Director
Office of Quality and Regulatory Compliance
U.S. Department of Energy
Environmental Management
Los Alamos Field Office

Enclosure(s): Two hard copies with electronic files

1. Los Alamos National Laboratory Site-Wide Monitoring Program, Los Alamos County Water Supply Wells, 2024 Sampling and Analysis Plan (EM2024-0015)

cc (letter and enclosure[s] emailed):

Laurie King, EPA Region 6, Dallas, TX
Aaron Rand, City of Santa Fe, Santa Fe, NM
Bill Schneider, City of Santa Fe, Santa Fe, NM
Steve Yanicak, NMED-DOE-OB
Joe Martinez, NMED-DWB
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**Los Alamos National Laboratory Site-Wide Monitoring Program,
Los Alamos County Water Supply Wells, 2024 Sampling and Analysis Plan**

**Table 1
Sampling and Analysis Plan for Los Alamos County
Water Supply Wells for the Period of January 1, 2024, to December 31, 2024**

Location	Analytical Suites ^a									
	Metals		Organics				Radionuclides		Inorganics	PFAS
	Metals	Chromium ^b	VOCs ^c	SVOCs ^d	PCBs ^e	HEXP ^f	Radionuclides	Low-Level Tritium	General Inorganics	PFAS ^g
G-2A	Q ^h 2	— ⁱ	Q2	Q2	—	Q2	Q2	Q2	Q2	—
G-3A	Q2	—	Q2	Q2	—	Q2	Q2	Q2	Q2	—
G-4A	Q2	—	Q2	Q2	—	Q2	Q2	Q2	Q2	—
G-5A	Q2	—	Q2	Q2	—	Q2	Q2	Q2	Q2	—
O-1	Q2, Q4	—	Q2	Q2	—	Q2	Q2	Q2	Q2, Q4	—
O-2	Q2, Q4	—	Q2, Q4	Q2, Q4	Q2, Q4	Q2, Q4	Q2, Q4	Q2, Q4	Q2, Q4	Q2, Q4
O-4	Q2, Q4	—	Q2	Q2	—	Q2	Q2	Q2	Q2, Q4	—
PM-1	Q2, Q4	—	Q2	Q2	—	Q2, Q4	Q2	Q2, Q4	Q2, Q4	—
PM-2	Q2, Q4	—	Q2	Q2	—	Q2, Q4	Q2	Q2, Q4	Q2, Q4	—
PM-3 ^j	Q1, Q2, Q3, Q4	Monthly	Q2	Q2	—	Q2	Q2	Q2, Q4	Q1, Q2, Q3, Q4	—
PM-4	Q2, Q4	Monthly	Q2	Q2	—	Q2, Q4	Q2	Q2, Q4	Q1, Q2, Q3, Q4	—
PM-5	Q2, Q4	Monthly	Q2	Q2	—	Q2, Q4	Q2	Q2, Q4	Q1, Q2, Q3, Q4	—

Notes: Sampling schedule: Q1 = Jan–Mar 2024; Q2 = Apr–Jun 2024; Q3 = Jul–Sep 2024; Q4 = Oct–Dec 2024; Monthly = Samples will be collected on a monthly basis. Quality control samples will be collected in accordance with Appendix D of the Interim Facility-Wide Groundwater Monitoring Plan for the associated monitoring year. Figure 1 shows locations of the Los Alamos County wells.

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

^b Monthly chromium samples will be filtered and analyzed using the SW-846:6020 method.

^c VOCs = Volatile organic compounds.

^d SVOCs = Semivolatile organic compounds.

^e PCBs = Polychlorinated biphenyls.

^f HEXP = High explosives.

^g PFAS = Per- and polyfluoroalkyl substances: perfluorohexane sulfonic acid (PFHxS), perfluorooctanoic acid (PFOA), and perfluorooctane sulfate (PFOS). No additional PFAS sampling will be performed after 2024 at O-2 unless a NMWQCC regulatory standard has been exceeded.

^h Q = Quarter.

ⁱ — = Samples are not collected at this location.

^j PM-3 has not been in operation since March 2022. Therefore, PM-3 will not be sampled until Los Alamos County informs the U.S. Department of Energy that the well will return to operations.

Table 2
Analytes, Field Preparation, and Analytical Methods
Used by U.S. Environmental Protection Agency
Contract Laboratory Program Laboratories for Samples Collected
Under the Sampling and Analysis Plan for Los Alamos County Water Supply Wells

Analytical Suite	Field Preparation	Analytical Method	Analytes
Metals ^c	Unfiltered	SW-846:7470 series	Mercury
		SW-846:6020	Aluminum, selenium
	Filtered	SM:A2340	Hardness
		SW-846:6010	Barium, boron, calcium, iron, magnesium, manganese, potassium, silicon dioxide, sodium, strontium, vanadium, zinc
		SW-846:6020	Aluminum, antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, silver, thallium, tin, uranium
		SW-846:7470 series	Mercury
	Unfiltered	SW-846:7470 series	Mercury
VOCs ^a	Unfiltered	SW-846:8260 series	See Table 3
SVOCs ^b	Unfiltered	SW-846:8270 series	See Table 3
PCBs ^c	Unfiltered	SW-846:8082	See Table 3
HEXP ^d	Unfiltered	SW-846:8330 series	See Table 3
PFAS ^e	Unfiltered	EPA 537.1 modified	Perfluorohexane sulfonic acid (PFHxS), perfluorooctane sulfate (PFOS), perfluorooctanoic acid (PFOA)
Radionuclides	Unfiltered	EPA:900	Gross alpha, gross beta
		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
		EPA:903.1	Radium-226
		EPA:904	Radium-228
		Generic: radium by calculation	Radium-226+228
Low-Level Tritium	Unfiltered	Generic: low-level tritium	Tritium

Table 2 (continued)

Analytical Suite	Field Preparation	Analytical Method	Analytes
General inorganics	Filtered	EPA:120.1	Specific conductance
		EPA:150.1	Acidity or alkalinity of a solution
		EPA:160.1	Total dissolved solids
		SW-846:9056 series	Bromide, chloride, fluoride, sulfate
		EPA:310.1	Alkalinity-CO ₃ , alkalinity-CO ₃ +HCO ₃
		SW-846:6850	Perchlorate
	Filtered	EPA:350.1	Ammonia as nitrogen
		EPA:353.2	Nitrate-nitrite as nitrogen
		EPA:365.4	Total phosphate as phosphorus
	Unfiltered	EPA:351.2	Total Kjeldahl nitrogen
		SW-846:9060	Total organic carbon
		SW-846:9012_CN(T)	Cyanide (Total)

^a VOCs = Volatile organic compounds.

^b SVOCs = Semivolatile organic compounds.

^c PCBs = Polychlorinated biphenyls.

^d HEXP = High explosives.

^e PFAS = Per- and polyfluoroalkyl substances: perfluorohexane sulfonic acid (PFHxS), perfluorooctanoic acid (PFOA), and perfluorooctane sulfate (PFOS).

Table 3

Analytical Methods Used by Contract Laboratories for Samples Collected Under the Sampling and Analysis Plan for Los Alamos County Water Supply Wells

Symbol or CAS ^a No.	Analyte
Analytical Suite: VOCs^b	
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-]
135-98-8	Butylbenzene[sec-]

Table 3 (continued)

Symbol or CAS ^a No.	Analyte
98-06-6	Butylbenzene[tert-]
75-15-0	Carbon disulfide
56-23-5	Carbon tetrachloride
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
98-82-8	Isopropylbenzene

Table 3 (continued)

Symbol or CAS ^a No.	Analyte
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 Method: SW-846:8270	
83-32-9	Acenaphthene
208-96-8	Acenaphthylene
62-53-3	Aniline
120-12-7	Anthracene
1912-24-9	Atrazine
92-87-5	Benzidine
56-55-3	Benzo(a)anthracene
50-32-8	Benzo(a)pyrene
205-99-2	Benzo(b)fluoranthene

Table 3 (continued)

Symbol or CAS ^a No.	Analyte
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-]
122-66-7	Diphenylhydrazine[1,2]
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 ^a 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-]
65794-96-9	Methylphenol[3-,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-]
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
1610-18-0	Prometon
129-00-0	Pyrene
110-86-1	Pyridine
126-33-0	Sulfolane
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-]
Analytical Suite: PCBs^d	
Analytical Method: SW-846:8082	
12674-11-2	Aroclor-1016
11104-28-2	Aroclor-1221
11141-16-5	Aroclor-1232

Table 3 (continued)

Symbol or CAS ^a No.	Analyte
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^e	
Analytical Method: SW-846:8330	
6629-29-4	2,4-diamino-6-nitrotoluene
59229-75-3	2,6-diamino-4-nitrotoluene
618-87-1	3,5-dinitroaniline
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 ^f
98-95-3	Nitrobenzene
88-72-2	Nitrotoluene[2-]
99-08-1	Nitrotoluene[3-]
99-99-0	Nitrotoluene[4-]
78-11-5	PETN ^g
121-82-4	RDX ^h
3058-38-6	TATB ⁱ
479-45-8	Tetryl
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 PCBs = Polychlorinated biphenyls.

^e HEXP = High explosives.

^f HMX = Her Majesty's Explosive.

^g PETN = Pentaerythritol tetranitrate.

^h RDX = Royal Demolition Explosive.

ⁱ TATB = Triaminotrinitrobenzene.

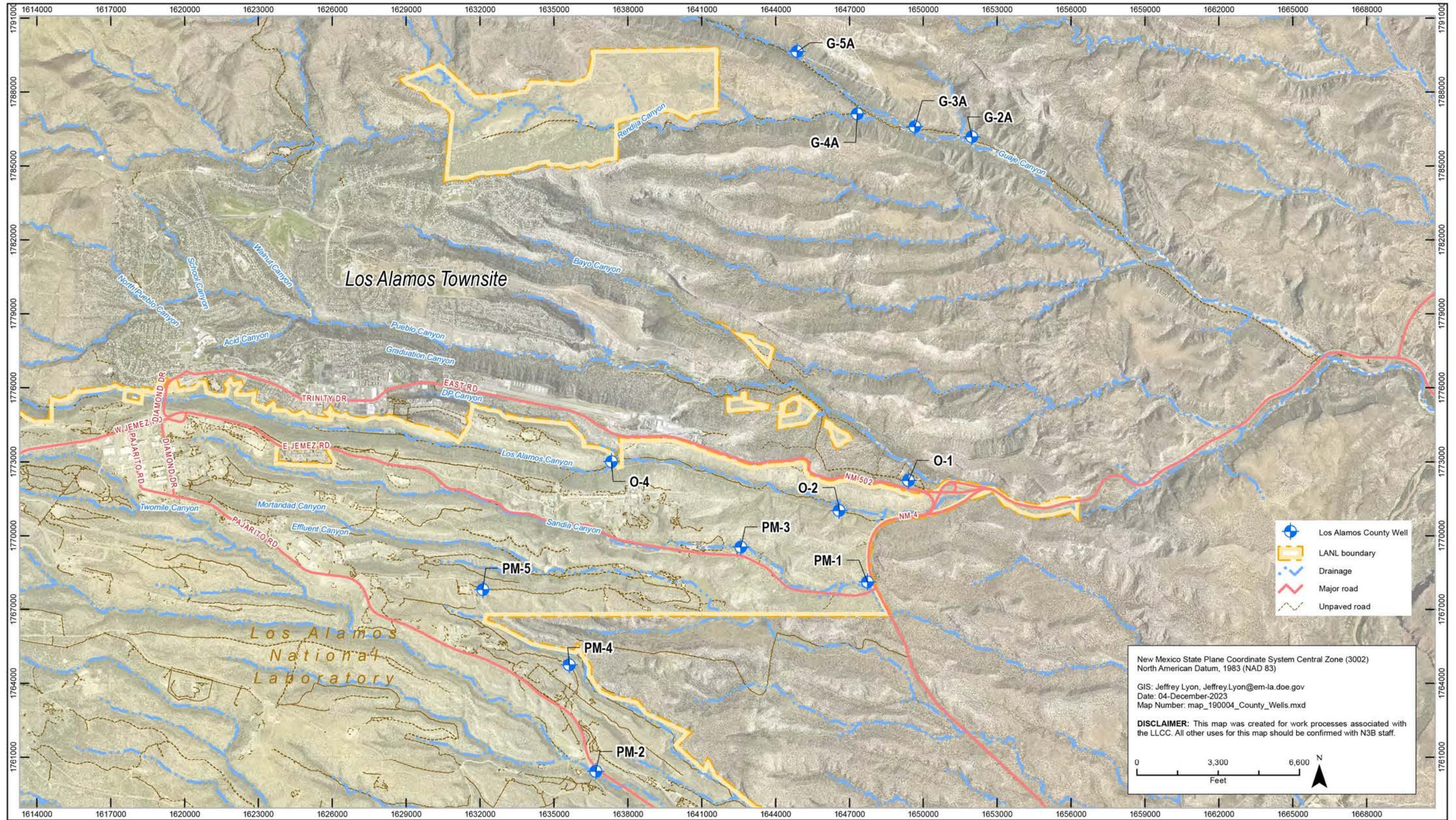


Figure 1 Locations of Los Alamos County wells