Quarterly Report

Calendar Year 2023 – Second Quarter, April 1 – June 30, 2023

Prepared by:

Carlsbad Environmental Monitoring & Research Center
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Field Programs - Radiation Safety Group

WIPP Underground Effluent Monitoring (Station A and Station B)

From April 1st to June 30th, a total of 134 filters from the primary skid at Station A, of which 110 were sample filters, 12 were trip blanks and 12 were filter blanks, were collected. In addition, 134 filters were collected from the backup skid at Station A (110 sample filters, 12 trip blanks, and 12 filter blanks). One hundred and ten filters have been collected from the primary skid at Station B, (86 sample filters, 12 trip blanks, and 12 filter blanks). One hundred and ten filters were collected from Station B backup (86 sample filters, 12 trip blanks, and 12 filter blanks), during the same time period. Station B was down due to the running of Station H. A total of 19 filters were collected from Station H, (13 sample filters, 3 trip blanks and 3 filter blanks).

All 134 filters from the primary skid at Station A have been processed (gravimetrics, sample flow volume, and mass concentration have been calculated in the Field Programs (FP) data package) and transferred to the Radiochemistry group (RC). All 134 of the Station A backup filters have been processed and transferred to the Environmental Chemistry group (EC). All 220 filters from each skid (primary and backup) at Station B have been processed and transferred to RC and EC, respectively.

Ambient Air Sampling

From April 1st to June 30th 24 ambient air samples were collected from the six perimeter and regional continuous sampling stations (On-Site, Near Field, Cactus Flats, WIPP East, Carlsbad, and Loving) using a high-volume sampler (HiVol). All filter samples have been processed (gravimetrics, total air flow values, and notes of any irregularities) by FP and transferred to RC.

Subtask - Non-Radiological analyses

Eight Whatman-41 filters and 4 trip blank filters were collected from April 1st to June 30th from the 2 sampling sites (Near Field and Cactus Flats) using a HiVol sampler. All filter samples have been processed (total air flow values and notes of any irregularities) by FP and transferred to EC.

Soil sampling

Twenty-seven soil samples were collected in the 2nd quarter. Processing will begin once all 36 samples are collected.

Surface Water Monitoring

From April 1st to June 30th, no surface water samples were collected. FP is planning on collecting additional surface water samples in August or September 2023.

Drinking Water Monitoring

From April 1st to June 30th, no drinking water samples were collected. FP is planning on collecting drinking water samples in August or September 2023.

Sediment Monitoring

No sediment sampling was performed from April 1st to June 30th. FP is planning on collecting sediment samples in August or September 2023.

Nuclear Materials Management and Safeguards

From April 1st to June 30th the Radiation Safety group (RS) has collected and bulked Rad waste from NMSU, LANL and the WIPP Labs groups working in this facility. RS has performed monthly surveys of all Rad laboratories in the building, including smears and dose rate measurements. All fume hoods are face velocity checked quarterly. The date of the last inspection was June 20, 2023. The XLB instrument, where the filters used for smears are counted, was calibrated on June 12, 2023. The HEPA system DOP test was performed on May 25, 2023. Several survey instruments have been sent off to Ludlum Corporation for calibration.

Radiochemistry Group

WIPP Underground Effluent Monitoring (Station A and Station B)

Gross alpha and beta activities on individual filters collected from station A, taken immediately before, and Station B, taken after the high-efficiency particulate air (HEPA) filtration, were counted using a low-background gas proportional counter (Protean Instruments) for 1200 minutes (20 hours). The analysis of all filters from Station A and Station B has been completed through July 2023. The complete results for gross alpha and gross beta counts on FAS filters from Station A and Station B through July 2023 were submitted to CBFO on August 9, 2023.

The analysis of all samples collected in 2020 and 2021 for ^{90}Sr is complete.

The analysis of all backlog samples collected in 2021 for alpha- and gamma-radiation-emitting radionuclides is complete. This includes determination of activities of ^{241}Am, ^{238}Pu, $^{239+240}$Pu, ^{234}U, ^{235}U, ^{238}U, ^{60}Co, ^{137}Cs, and ^{40}K.

The total number of samples processed includes the following:

- 24 samples by gamma counter analysis
- 108 samples by alpha counter analysis
- 367 samples by liquid scintillation counter analysis (all of 2020 and 2021 samples analyzed for ^{90}Sr).

Characteristic results are shown in the following tables.

Please note that currently only two of the four gamma-radiation detectors are operational. Note also that each sample count lasts two days and additional time is required for the mandatory calibration and maintenance procedures between sample counts. Therefore, unless the two detectors are serviced very soon, it will be impossible to complete analysis of the remaining 2022 samples by the end of 2023.

Activity concentrations of ^{241}Am at Onsite station

Radionuclide	Sample Date 2021	Activity Bq/m^3	Unc.(2σ) Bq/m^3	MDC Bq/m^3	Status
^{241}Am	Jan. 14 – Feb. 2	1.75E-08	1.12E-08	1.96E-08	Not detected
	Feb. 2 – Mar. 2	9.89E-09	5.34E-09	8.64E-09	Detected
	Mar. 2 – Mar. 23	1.58E-08	9.42E-09	1.52E-08	Detected
	Mar. 23 – Apr. 20	3.41E-08	1.24E-08	7.38E-09	Detected
	Apr. 20 – May 18	2.26E-08	9.19E-09	6.16E-09	Detected
	May 18 – Jun. 30	1.50E-07	6.32E-08	8.88E-08	Detected
	Jun. 30 – Aug. 10	4.63E-09	4.38E-09	8.97E-09	Not detected
	Aug. 10 – Sep. 2	8.28E-09	7.80E-09	1.62E-08	Not detected
	Sep. 2 – Oct. 8	1.56E-10	1.13E-09	2.94E-09	Not detected
	Oct. 8 – Oct. 26	4.47E-09	9.65E-09	2.28E-08	Not detected
	Oct. 26 - Nov. 2	-6.91E-09	1.55E-08	4.40E-08	Not detected
	Nov. 2 – Dec. 3	-5.23E-10	4.31E-09	1.17E-08	Not detected
	Dec. 3 - Dec. 23	4.68E-06	4.85E-07	2.26E-08	Not detected
	Dec. 23 - Feb. 2	5.10E-09	3.96E-09	7.39E-09	Not detected

Activity concentrations of ^{238}Pu at Onsite station

Radionuclide	Sample Date 2021	Activity Bq/m^3	Unc. (2σ) Bq/m^3	MDC Bq/m^3	Status
^{238}Pu	Jan. 14 – Feb. 2	0.00E+00	2.96E-09	9.72E-09	Not detected
	Feb. 2 – Mar. 2	4.53E-10	3.00E-09	7.89E-09	Not detected
	Mar. 2 – Mar. 23	-4.64E-09	5.59E-09	1.87E-08	Not detected
	Mar. 23 – Apr. 20	-2.16E-09	7.47E-09	2.17E-08	Not detected
	Apr. 20 – May 18	1.76E-09	4.31E-09	1.06E-08	Not detected
	May 18 – Jun. 30	3.14E-08	3.49E-08	7.11E+00	Not detected
	Jun. 30 – Aug. 10	1.14E-09	3.24E-09	8.05E-09	Not detected
	Aug. 10 – Sep. 2	2.38E-09	6.55E-09	1.60E-08	Not detected
	Sep. 2 – Oct. 8	-1.70E-09	2.95E-09	9.04E-09	Not detected
	Oct. 8 – Oct. 26	0.00E+00	6.49E-09	1.79E-08	Not detected
	Oct. 26 - Nov. 2	-2.08E-08	1.57E-08	5.54E-08	Not detected
	Nov. 2 – Dec. 3	-2.89E-09	8.19E-09	2.52E-08	Not detected
	Dec. 3 - Dec. 23	-4.28E-09	1.03E-08	3.04E-08	Not detected
	Dec. 23 - Feb. 2	-4.09E-10	2.16E-09	6.48E-09	Not detected

Specific activity of U isotopes (^{234}U, ^{235}U, and ^{238}U) at Onsite station

Radionuclide	Sample Date 2021	Activity Bq/g	Unc. (2σ) Bq/g	MDC Bq/g	Status
^{234}U	Jan. 14 – Feb. 2	4.87E-02	6.17E-03	7.03E-04	Detected
	Feb. 2 – Mar. 2	3.57E-02	4.50E-03	7.46E-04	Detected
	Mar. 2 – Mar. 23	4.49E-02	5.49E-03	4.91E-04	Detected
	Mar. 23 – Apr. 20	3.54E-02	4.45E-03	5.24E-04	Detected
	Apr. 20 – May 18	4.26E-02	5.38E-03	5.14E-04	Detected
	May 18 – Jun. 30	2.50E-02	2.86E-03	1.24E-04	Detected
	Jun. 30 – Aug. 10	3.33E-02	4.96E-03	7.86E-04	Detected
	Aug. 10 – Sep. 2	4.39E-02	5.41E-03	5.57E-04	Detected
	Sep. 2 – Oct. 8	2.82E-02	3.05E-03	1.51E-04	Detected
	Oct. 8 – Oct. 26	6.57E-02	7.91E-03	1.01E-03	Detected
	Oct.26 – Nov. 2	3.08E-02	4.74E-03	1.40E-02	Detected
	Nov. 2 – Dec. 3	2.19E-02	2.72E-03	5.02E-04	Detected
	Dec. 3 - Dec. 23	1.03E-02	1.31E-03	2.40E-04	Detected
	Dec. 23 - Feb. 2	2.33E-02	2.74E-03	3.34E-04	Detected
^{235}U	Jan. 14 – Feb. 2	2.21E-03	7.57E-04	8.67E-04	Detected
	Feb. 2 – Mar. 2	1.34E-03	4.99E-04	6.14E-04	Detected
	Mar. 2 – Mar. 23	1.68E-03	4.79E-04	3.25E-04	Detected
	Mar. 23 – Apr. 20	2.10E-03	5.29E-04	3.45E-04	Detected
	Apr. 20 – May 18	1.71E-03	5.75E-04	5.78E-04	Detected
	May 18 – Jun. 30	1.60E-03	2.88E-04	5.99E-05	Detected
	Jun. 30 – Aug. 10	1.44E-03	5.93E-04	5.78E-04	Detected
	Aug. 10 – Sep. 2	2.31E-03	6.52E-04	4.39E-04	Detected
	Sep. 2 – Oct. 8	1.42E-03	2.68E-04	8.11E-05	Detected
	Oct. 8 – Oct. 26	3.51E-03	8.93E-04	6.04E-04	Detected
	Oct.26 – Nov. 2	4.45E-03	1.65E-03	2.04E-03	Detected
	Nov. 2 – Dec. 3	2.24E-03	5.35E-04	2.31E-04	Detected
	Dec. 3 - Dec. 23	1.18E-03	3.06E-04	1.89E-04	Detected
	Dec. 23 - Feb. 2	1.58E-03	3.86E-04	2.20E-04	Detected

Activity concentrations of $^{239+240}$Pu at Near Field station

Radionuclides	Sample Date 2021	Activity Bq/m^3	Unc. (2σ) Bq/m^3	MDC Bq/m^3	Status
$^{239+240}$Pu	Jan. 14 – Feb. 2	8.21E-09	9.13E-09	1.86E-08	Not detected
	Feb. 2 – Mar. 2	1.39E-08	9.39E-09	1.61E-08	Not detected
	Mar. 2 – Mar. 23	2.50E-08	1.31E-08	2.04E-08	Detected
	Mar. 23 – Apr. 20	2.50E-08	1.28E-08	1.80E-08	Detected
	Apr. 20 – May 18	1.95E-08	1.42E-08	2.81E-08	Not detected
	May 18 – Jun. 30	1.11E-08	6.80E-09	1.19E-08	Not detected
	Jun. 30 – Aug. 10	3.21E-09	3.32E-09	6.43E-09	Not detected
	Aug. 10 – Sep. 2	-9.75E-10	8.05E-09	2.19E-08	Not detected
	Sep. 2 – Oct. 8	5.94E-09	5.13E-09	7.86E-09	Not detected
	Oct. 8 – Oct. 26	1.05E-08	8.82E-09	1.66E-08	Not detected
	Oct. 26 - Nov. 2	1.98E-08	2.20E-08	4.48E-08	Not detected
	Nov. 2 – Dec. 3	4.65E-09	1.10E-08	2.62E-08	Not detected
	Dec. 3 - Dec. 23	-4.09E-09	1.29E-08	3.84E-08	Not detected
	Dec. 23 - Feb. 2	6.88E-10	4.42E-10	6.36E-10	Detected

Activity concentrations of ^{241}Am Near Field station

Radionuclides	Sample Date 2021	Activity Bq/m^3	Unc. (2σ) Bq/m^3	MDC Bq/m^3	Status
^{241}Am	Jan. 14 – Feb. 2	1.22E-08	1.24E-08	2.60E-08	Not detected
	Feb. 2 – Mar. 2	9.12E-09	1.00E-08	2.14E-08	Not detected
	Mar. 2 – Mar. 23	1.72E-08	1.09E-08	1.93E-08	Not detected
	Mar. 23 – Apr. 20	2.02E-08	1.09E-08	1.60E-08	Detected
	Apr. 20 – May 18	1.52E-08	8.77E-09	1.34E-08	Detected
	May 18 – Jun. 30	6.33E-09	4.80E-09	9.30E-09	Not detected
	Jun. 30 – Aug. 10	2.43E-09	3.78E-09	8.62E-09	Not detected
	Aug. 10 – Sep. 2	1.27E-15	5.67E-09	1.50E-08	Not detected
	Sep. 2 – Oct. 8	-8.83E-09	1.00E-08	2.90E-08	Not detected
	Oct. 8 – Oct. 26	1.07E-08	9.75E-09	1.95E-08	Not detected
	Oct. 26 - Nov. 2	-1.47E-08	1.47E-08	4.67E-08	Not detected
	Nov. 2 – Dec. 3	0.00E+00	3.51E-09	9.42E-09	Not detected
	Dec. 3 - Dec. 23	6.02E-09	8.53E-09	1.89E-08	Not detected
	Dec. 23 - Feb. 2	1.09E-09	4.10E-09	1.03E-08	Not detected

Activity concentrations of gamma emitting isotopes (^{137}Cs, ^{60}Co, and ^{40}K) in the filter samples collected from Onsite station

Radionuclide	Sample Date 2021	Activity Bq/m^3	Unc. (2σ) Bq/m^3	MDC Bq/m^3	Status
^{137}Cs	Jan. 14 – Feb. 2	-9.63E-07	6.89E-07	2.35E-06	Not detected
	Feb. 2 – Mar. 2	5.92E-07	1.86E-07	5.99E-07	Not detected
	Mar. 2 – Mar. 23	5.00E-07	5.29E-07	1.75E-06	Not detected
	Mar. 23 – Apr. 20	1.11E-06	2.78E-07	8.85E-07	detected
	Apr. 20 – May 18	2.48E-06	8.96E-07	2.90E-06	Not detected
	May 18 – Jun. 30	-1.66E-06	3.95E-06	1.33E-05	Not detected
	Jun. 30 – Aug. 10	-4.91E-07	4.07E-07	1.38E-06	Not detected
	Aug. 10 – Sep. 2	3.11E-07	3.07E-07	1.02E-06	Not detected
	Sep. 2 – Oct. 8	6.48E-08	1.26E-07	4.22E-07	Not detected
	Oct. 8 – Oct. 26	7.08E-07	3.34E-07	1.09E-06	Not detected
	Oct. 26 - Nov. 2	-1.42E-06	1.94E-06	6.60E-06	Not detected
	Nov. 2 – Dec. 3	4.36E-07	2.24E-07	7.34E-07	Not detected
	Dec. 3 - Dec. 23	1.85E-07	2.23E-07	7.41E-07	Not detected
	Dec. 23 - Feb. 2	3.20E-07	1.27E-07	4.13E-07	Not detected
^{60}Co	Jan. 14 – Feb. 2	2.54E-07	5.09E-07	1.72E-06	not detected
	Feb. 2 – Mar. 2	2.13E-07	1.70E-07	5.64E-07	not detected
	Mar. 2 – Mar. 23	1.60E-07	4.27E-07	1.43E-06	not detected
	Mar. 23 – Apr. 20	1.47E-06	3.40E-07	1.07E-06	detected
	Apr. 20 – May 18	4.57E-07	6.66E-07	2.24E-06	not detected
	May 18 – Jun. 30	5.30E-06	2.94E-06	9.62E-06	not detected
	Jun. 30 – Aug. 10	4.24E-07	2.60E-07	8.54E-07	not detected
	Aug. 10 – Sep. 2	-2.16E-07	2.42E-07	8.40E-07	not detected
	Sep. 2 – Oct. 8	8.05E-08	1.18E-07	3.95E-07	not detected
	Oct. 8 – Oct. 26	2.51E-07	2.17E-07	7.18E-07	not detected
	Oct. 26 - Nov. 2	6.24E-07	1.76E-06	5.97E-06	not detected
	Nov. 2 – Dec. 3	2.59E-07	2.54E-07	8.42E-07	not detected
	Dec. 3 - Dec. 23	1.56E-07	3.03E-07	1.02E-06	not detected
	Dec. 23 - Feb. 2	2.47E-07	1.20E-07	3.90E-07	not detected

Activity concentrations of gamma emitting isotopes (^{137}Cs, ^{60}Co, and ^{40}K) in the filter samples collected from Onsite station (continued)

Radionuclide	Sample Date 2021	Activity Bq/m^3	Unc. (2σ) Bq/m^3	MDC Bq/m^3	Status
^{40}K	Jan. 14 – Feb. 2	5.55E-05	7.97E-06	2.31E-05	detected
	Feb. 2 – Mar. 2	2.57E-05	2.75E-06	8.01E-06	detected
	Mar. 2 – Mar. 23	7.60E-05	7.97E-06	2.42E-05	detected
	Mar. 23 – Apr. 20	7.66E-05	7.00E-06	2.06E-05	detected
	Apr. 20 – May 18	1.37E-04	1.65E-05	5.01E-05	detected
	May 18 – Jun. 30	1.46E-04	3.14E-05	9.44E-05	detected
	Jun. 30 – Aug. 10	2.31E-05	3.57E-06	1.04E-05	detected
	Aug. 10 – Sep. 2	-6.50E-06	6.18E-06	2.09E-05	not detected
	Sep. 2 – Oct. 8	-2.77E-06	3.16E-06	1.07E-05	not detected
	Oct. 8 – Oct. 26	3.47E-05	5.81E-06	1.81E-05	detected
	Oct. 26 - Nov. 2	-1.25E-04	3.49E-05	1.22E-04	not detected
	Nov. 2 – Dec. 3	2.75E-05	3.70E-06	1.14E-05	detected
	Dec. 3 - Dec. 23	-9.14E-07	4.73E-06	1.59E-05	not detected
	Dec. 23 - Feb. 2	4.51E-06	2.60E-06	8.53E-06	not detected

Environmental Chemistry Group

From April 1 through June 30, 2023, the Environmental Chemistry group (EC) worked on processing Fixed Air Sampler (FAS) filters, completing proficiency tests, and analyzing surface water samples collected in 2023. The FAS filter analysis included filters collected in 2022, but the most significant accomplishment is that the analysis of all backlog filters, dating back to 2015, was completed during the second quarter of 2023.

The following Tables and Figures represent characteristic results.

Sample Type: FAS, Station A
Year: 2017
Analysis Performed: Metals in weekly composites

Week	Aluminum ng/m³	Cadmium ng/m³	Lead ng/m³	Magnesium ng/m³	Silicon ng/m³	Thorium ng/m³	Uranium ng/m³
01/01/17	1.760E+02	4.430E-01	3.450E+00	1.573E+03	7.601E+02	<MDL	3.196E-02
01/08/17	1.831E+02	4.043E-01	3.214E+00	1.770E+03	9.452E+02	<MDL	5.466E-02
01/15/17	<MDL	4.532E-01	1.566E+00	1.063E+03	6.758E+02	<MDL	<MDL
01/22/17	2.039E+02	4.736E-01	2.356E+00	1.382E+03	9.789E+02	<MDL	3.177E-02
02/01/17	2.309E+02	4.066E-01	7.101E+00	1.157E+03	8.531E+02	<MDL	2.499E-02
02/08/17	2.620E+02	3.382E-01	2.005E+00	1.033E+03	1.082E+03	<MDL	2.629E-02
02/15/17	2.072E+02	3.885E-01	1.951E+00	1.364E+03	8.528E+02	<MDL	2.711E-02
02/22/17	3.366E+02	3.836E-01	2.006E+00	1.352E+03	1.377E+03	<MDL	3.300E-02
03/01/17	2.388E+02	5.566E-01	2.714E+00	1.132E+03	1.005E+03	<MDL	2.555E-02
03/08/17	<MDL	3.892E-01	1.243E+00	9.470E+02	9.054E+02	<MDL	<MDL
03/15/17	<MDL	4.005E-01	2.891E+00	8.320E+02	6.507E+02	<MDL	<MDL
03/22/17	3.404E+02	4.107E-01	1.554E+00	1.327E+03	1.361E+03	<MDL	3.272E-02
04/01/17	2.214E+02	6.610E-01	1.896E+00	1.061E+03	8.257E+02	<MDL	2.902E-02
04/08/17	1.821E+02	4.641E-01	1.252E+00	7.864E+02	8.516E+02	<MDL	<MDL
04/15/17	1.796E+02	1.009E+00	1.103E+00	6.018E+02	6.994E+02	<MDL	<MDL
04/22/17	3.251E+02	6.661E-01	1.680E+00	1.061E+03	1.235E+03	<MDL	3.045E-02
05/01/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/08/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/15/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/22/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/01/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/08/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/15/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/22/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/01/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/08/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/15/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/22/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/01/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/08/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/15/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/22/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/01/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/08/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/15/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/22/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/01/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/08/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/15/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/22/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/01/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/08/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/15/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/22/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/01/17	3.576E+02	3.871E-01	1.934E+00	1.779E+03	N/A	5.534E-02	4.628E-02
12/08/17	3.963E+02	3.815E-01	2.200E+00	2.430E+03	N/A	5.083E-02	5.570E-02
12/15/17	2.580E+02	3.058E-01	1.275E+00	2.261E+03	N/A	<MDL	4.008E-02
12/22/17	1.769E+02	4.698E-01	1.172E+00	1.180E+03	7.239E+02	<MDL	2.549E-02

NOTE: Filters not received from May through November.

Sample Type: FAS, Station B
Year: 2017
Analysis Performed: Metals in weekly composites

Week	Aluminum ng/m^3	Cadmium ng/m^3	Lead ng/m^3	Magnesium ng/m^3	Silicon ng/m^3	Thorium ng/m^3	Uranium ng/m^3
01/01/17	<MDL	2.067E-01	9.381E-02	<MDL	N/A	<MDL	<MDL
01/08/17	<MDL	2.866E-01	1.341E-01	<MDL	N/A	<MDL	<MDL
01/15/17	<MDL	1.915E-01	1.386E-01	<MDL	N/A	<MDL	<MDL
01/22/17	<MDL	2.038E-01	N/A	<MDL	N/A	<MDL	<MDL
02/01/17	<MDL	2.072E-01	1.205E-01	<MDL	2.779E+02	<MDL	<MDL
02/08/17	<MDL	1.939E-01	9.190E-02	<MDL	<MDL	<MDL	<MDL
02/15/17	<MDL	2.247E-01	1.573E-01	<MDL	2.768E+02	<MDL	<MDL
02/22/17	<MDL	2.107E-01	2.742E-01	<MDL	3.204E+02	<MDL	<MDL
03/01/17	<MDL	2.174E-01	1.261E-01	<MDL	2.836E+02	<MDL	<MDL
03/08/17	<MDL	2.832E-01	1.055E-01	<MDL	<MDL	<MDL	<MDL
03/15/17	<MDL	2.334E-01	2.104E-01	<MDL	3.184E+02	<MDL	<MDL
03/22/17	<MDL	2.106E-01	1.970E-01	<MDL	2.907E+02	<MDL	<MDL
04/01/17	<MDL	2.070E-01	1.098E-01	<MDL	2.798E+02	<MDL	<MDL
04/08/17	<MDL	2.175E-01	2.051E-01	<MDL	<MDL	<MDL	<MDL
04/15/17	<MDL	2.131E-01	1.909E-01	<MDL	2.752E+02	<MDL	<MDL
04/22/17	<MDL	2.130E-01	3.315E-01	<MDL	3.454E+02	<MDL	<MDL
05/01/17	<MDL	2.296E-01	1.914E-01	<MDL	3.076E+02	<MDL	<MDL
05/08/17	<MDL	2.447E-01	1.474E-01	<MDL	<MDL	<MDL	<MDL
05/15/17	<MDL	2.417E-01	1.242E-01	<MDL	3.064E+02	<MDL	<MDL
05/22/17	<MDL	2.215E-01	1.556E-01	<MDL	<MDL	<MDL	<MDL
06/01/17	<MDL	2.099E-01	1.637E-01	<MDL	2.832E+02	<MDL	<MDL
06/08/17	<MDL	2.359E-01	1.535E-01	<MDL	<MDL	<MDL	<MDL
06/15/17	<MDL	1.824E-01	1.067E-01	<MDL	2.651E+02	<MDL	<MDL
06/22/17	<MDL	2.178E-01	1.314E-01	<MDL	<MDL	<MDL	<MDL
07/01/17	<MDL	2.383E-01	1.784E-01	<MDL	3.276E+02	<MDL	<MDL
07/08/17	<MDL	2.026E-01	1.175E-01	<MDL	<MDL	<MDL	2.221E-02
07/15/17	<MDL	2.141E-01	8.175E-01	<MDL	<MDL	<MDL	<MDL
07/22/17	8.720E+01	2.128E-01	1.061E+00	1.638E+02	4.781E+02	<MDL	<MDL
08/01/17	<MDL	2.054E-01	3.639E-01	<MDL	3.852E+02	<MDL	<MDL
08/08/17	<MDL	2.075E-01	1.998E-01	<MDL	2.797E+02	<MDL	<MDL
08/15/17	<MDL	1.915E-01	1.479E-01	<MDL	3.241E+02	<MDL	<MDL
08/22/17	<MDL	1.954E-01	1.916E-01	<MDL	<MDL	<MDL	<MDL
09/01/17	<MDL	6.058E-01	3.395E+00	9.371E+02	7.690E+02	<MDL	<MDL
09/08/17	<MDL	5.197E-01	2.201E+00	1.403E+03	7.552E+02	<MDL	3.264E-02
09/15/17	<MDL	7.898E-01	3.092E+00	1.330E+03	1.207E+03	<MDL	4.542E-02
09/22/17	<MDL	8.427E-01	4.385E+00	1.502E+03	7.998E+02	<MDL	6.189E-02
10/01/17	<MDL	1.859E-01	1.229E-01	<MDL	<MDL	<MDL	<MDL
10/08/17	<MDL	1.880E-01	1.307E-01	<MDL	<MDL	<MDL	<MDL
10/15/17	<MDL	1.942E-01	1.263E-01	<MDL	2.669E+02	<MDL	<MDL
10/22/17	<MDL	1.914E-01	1.509E-01	<MDL	2.761E+02	<MDL	<MDL
11/01/17	<MDL	2.106E-01	1.958E-01	<MDL	3.513E+02	<MDL	<MDL
11/08/17	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/15/17	<MDL	2.057E-01	1.507E-01	<MDL	<MDL	<MDL	<MDL
11/22/17	<MDL	2.011E-01	1.124E-01	<MDL	<MDL	<MDL	<MDL
12/01/17	<MDL	2.066E-01	9.509E-02	<MDL	2.626E+02	<MDL	<MDL
12/08/17	<MDL	1.934E-01	1.494E-01	<MDL	2.670E+02	<MDL	<MDL
12/15/17	<MDL	2.143E-01	1.920E-01	<MDL	<MDL	<MDL	<MDL
12/22/17	<MDL	1.999E-01	1.684E-01	<MDL	<MDL	<MDL	<MDL

NOTE: Filters not received 2nd week of November

Sample Type: FAS, Station A
Year: 2016
Analysis Performed: Metals in weekly composites

Week	Aluminum ng/m^3	Cadmium ng/m^3	Lead ng/m^3	Magnesium ng/m^3	Silicon ng/m^3	Thorium ng/m^3	Uranium ng/m^3
01/01/16	<MDL	1.014E+00	2.995E+00	1.176E+03	<MDL	<MDL	<MDL
01/08/16	<MDL	1.899E+00	3.785E+00	1.578E+03	<MDL	<MDL	<MDL
01/15/16	<MDL	2.269E+00	2.559E+00	2.546E+03	2.611E+03	<MDL	<MDL
01/22/16	<MDL	1.776E+00	4.061E+00	3.915E+03	2.439E+03	<MDL	<MDL
02/01/16	<MDL	2.457E+00	3.112E+00	2.387E+03	<MDL	<MDL	<MDL
02/08/16	<MDL	3.033E+00	3.860E+00	2.206E+03	4.354E+03	<MDL	<MDL
02/15/16	<MDL	3.237E+00	2.532E+00	1.318E+03	<MDL	<MDL	<MDL
02/22/16	<MDL	3.645E+00	3.628E+00	1.583E+03	4.469E+03	<MDL	<MDL
03/01/16	<MDL	2.943E+00	2.862E+00	<MDL	<MDL	<MDL	<MDL
03/08/16	<MDL	2.250E+00	9.269E-01	<MDL	<MDL	<MDL	<MDL
03/15/16	<MDL	2.727E+00	2.021E+00	1.946E+03	<MDL	<MDL	<MDL
03/22/16	<MDL	4.610E+00	1.883E+00	1.522E+03	3.634E+03	<MDL	<MDL
04/01/16	<MDL	2.505E+00	1.656E+00	1.177E+03	<MDL	<MDL	<MDL
04/08/16	<MDL	2.689E+00	N/A	<MDL	<MDL	<MDL	<MDL
04/15/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04/22/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/01/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/08/16	1.322E+02	3.524E-01	4.525E+00	7.250E+02	5.863E+02	<MDL	2.861E-02
05/15/16	1.015E+02	3.076E-01	1.790E+00	6.905E+02	4.687E+02	<MDL	2.572E-02
05/22/16	1.266E+02	2.925E-01	2.181E+00	9.890E+02	5.473E+02	<MDL	3.202E-02
06/01/16	<MDL	2.686E-01	1.418E+00	1.000E+03	4.975E+02	<MDL	2.320E-02
06/08/16	1.162E+02	3.244E-01	2.171E+00	1.333E+03	6.785E+02	<MDL	2.952E-02
06/15/16	1.600E+02	2.562E-01	1.812E+00	1.201E+03	6.185E+02	<MDL	2.756E-02
06/22/16	1.830E+02	3.950E-01	3.974E+00	1.705E+03	8.598E+02	<MDL	3.601E-02
07/01/16	1.092E+02	2.900E-01	9.575E-01	1.438E+03	4.744E+02	<MDL	2.681E-02
07/08/16	2.076E+02	3.722E-01	2.086E+00	1.111E+03	8.255E+02	<MDL	3.929E-02
07/15/16	2.053E+02	3.812E-01	1.634E+00	9.573E+02	6.559E+02	<MDL	3.382E-02
07/22/16	<MDL	4.384E-01	2.606E+00	1.182E+03	6.284E+02	<MDL	2.803E-02
08/01/16	1.844E+02	3.518E-01	3.003E+00	1.343E+03	8.171E+02	<MDL	3.015E-02
08/08/16	<MDL	3.934E-01	1.608E+00	1.788E+03	6.999E+02	<MDL	2.703E-02
08/15/16	<MDL	4.642E-01	2.731E+00	1.076E+03	7.783E+02	<MDL	3.293E-02
08/22/16	<MDL	2.982E-01	8.588E-01	1.410E+03	4.296E+02	<MDL	1.978E-02
09/01/16	<MDL	3.485E-01	1.073E+00	1.737E+03	4.066E+02	<MDL	2.337E-02
09/08/16	<MDL	3.183E-01	1.486E+00	9.988E+02	4.282E+02	<MDL	1.717E-02
09/15/16	<MDL	1.545E-01	8.571E-01	4.612E+02	<MDL	<MDL	<MDL
09/22/16	1.435E+02	4.461E-01	2.242E+00	8.583E+02	7.929E+02	<MDL	4.386E-02
10/01/16	2.540E+02	2.896E-01	3.784E+00	1.079E+03	1.124E+03	<MDL	5.637E-02
10/08/16	1.197E+02	2.179E-01	3.174E+00	6.020E+02	7.711E+02	<MDL	3.953E-02
10/15/16	2.611E+02	2.037E-01	5.504E+00	1.114E+03	1.116E+03	<MDL	6.780E-02
10/22/16	1.535E+02	2.193E-01	3.439E+00	5.975E+02	8.598E+02	<MDL	4.244E-02
11/01/16	1.072E+02	3.835E-01	2.441E+00	6.316E+02	4.739E+02	<MDL	2.946E-02
11/08/16	<MDL	4.560E-01	3.315E+00	6.498E+02	6.641E+02	<MDL	3.372E-02
11/15/16	2.198E+02	3.773E-01	3.193E+00	1.239E+03	8.123E+02	<MDL	3.908E-02
11/22/16	1.441E+02	3.755E-01	1.730E+00	8.290E+02	7.249E+02	<MDL	2.610E-02
12/01/16	1.319E+02	3.997E-01	2.552E+00	8.294E+02	5.583E+02	<MDL	4.036E-02
12/08/16	2.086E+02	4.817E-01	2.645E+00	9.771E+02	1.119E+03	8.812E-02	9.029E-02
12/15/16	3.344E+02	4.221E-01	2.217E+00	6.767E+03	1.160E+03	<MDL	4.825E-02
12/22/16	<MDL	3.816E-01	1.313E+00	1.565E+03	6.378E+02	<MDL	2.582E-02

NOTE: Some filters were not received in April and May.

It should be noted that the corresponding 2016 Station B filter analyses was completed in 2021.

Sample Type: FAS, Station A
Year: 2015
Analysis Performed: Metals in weekly composites

Week	Aluminum ng/m³	Cadmium ng/m³	Lead ng/m³	Magnesium ng/m³	Silicon ng/m³	Thorium ng/m³	Uranium ng/m³
01/01/15	1.021E+02	3.535E-01	1.916E+00	7.730E+02	4.301E+02	<MDL	2.117E-02
01/08/15	1.407E+02	3.967E-01	1.849E+00	7.657E+02	6.357E+02	<MDL	1.927E-02
01/15/15	1.299E+02	3.886E-01	1.209E+00	9.019E+02	6.484E+02	<MDL	<MDL
01/22/15	<MDL	5.786E-01	2.357E+00	7.473E+02	6.325E+02	<MDL	3.500E-02
02/01/15	<MDL	3.299E-01	3.165E+00	7.634E+02	3.765E+02	<MDL	1.800E-02
02/08/15	1.108E+02	3.118E-01	3.032E+00	9.427E+02	5.301E+02	<MDL	2.259E-02
02/15/15	1.434E+02	6.182E-01	5.528E+00	1.197E+03	7.674E+02	<MDL	5.096E-02
02/22/15	1.215E+02	4.758E-01	5.893E+00	1.259E+03	8.276E+02	<MDL	5.228E-02
03/01/15	<MDL	4.400E-01	1.224E+00	2.740E+03	3.715E+02	<MDL	2.533E-02
03/08/15	<MDL	4.459E-01	3.980E+00	8.660E+02	5.692E+02	<MDL	2.699E-02
03/15/15	<MDL	1.987E+00	8.943E+00	1.054E+03	7.734E+02	<MDL	<MDL
03/22/15	<MDL	5.133E-01	1.980E+00	9.042E+02	6.614E+02	<MDL	<MDL
04/01/15	<MDL	6.763E-01	3.554E+00	8.434E+02	7.399E+02	<MDL	2.712E-02
04/08/15	<MDL	7.691E-01	1.745E+00	1.068E+03	7.811E+02	<MDL	<MDL
04/15/15	<MDL	5.940E-01	2.421E+00	1.048E+03	8.085E+02	<MDL	<MDL
04/22/15	<MDL	7.936E-01	3.751E+00	1.189E+03	7.544E+02	<MDL	3.878E-02
05/01/15	<MDL	7.232E-01	1.003E+01	1.263E+03	8.075E+02	<MDL	<MDL
05/08/15	<MDL	8.203E-01	1.182E+01	1.560E+03	9.374E+02	<MDL	3.818E-02
05/15/15	1.038E+02	3.930E-01	2.515E+00	1.416E+03	6.257E+02	<MDL	4.260E-02
05/22/15	9.521E+01	3.192E-01	8.931E+00	1.172E+03	5.655E+02	<MDL	3.420E-02
06/01/15	<MDL	4.271E-01	3.033E+00	1.599E+03	4.417E+02	<MDL	2.925E-02
06/08/15	9.893E+01	3.272E-01	3.342E+00	1.808E+03	5.395E+02	<MDL	3.011E-02
06/15/15	9.909E+01	3.656E-01	2.572E+00	1.742E+03	4.248E+02	<MDL	2.517E-02
06/22/15	3.285E+02	1.674E+00	2.493E+00	7.204E+03	1.332E+03	<MDL	4.490E-02
07/01/15	2.238E+02	9.500E-01	3.479E+00	2.028E+03	1.037E+03	<MDL	4.082E-02
07/08/15	3.345E+02	6.517E-01	6.850E+00	1.664E+03	1.310E+03	<MDL	5.490E-02
07/15/15	1.271E+02	4.940E-01	2.822E+00	1.212E+03	7.005E+02	<MDL	4.201E-02
07/22/15	<MDL	4.637E-01	1.720E+01	1.005E+03	7.447E+02	<MDL	3.324E-02
08/01/15	<MDL	8.914E-01	3.691E+00	1.101E+03	1.046E+03	<MDL	4.089E-02
08/08/15	<MDL	7.100E-01	3.547E+00	1.090E+03	9.441E+02	<MDL	3.453E-02
08/15/15	<MDL	8.269E-01	3.428E+00	1.238E+03	9.037E+02	<MDL	4.572E-02
08/22/15	<MDL	9.591E-01	3.528E+00	1.224E+03	8.742E+02	<MDL	4.177E-02
09/01/15	<MDL	6.038E-01	1.722E+00	1.035E+03	9.275E+02	<MDL	<MDL
09/08/15	<MDL	2.453E+00	4.801E+00	1.237E+03	1.131E+03	<MDL	<MDL
09/15/15	<MDL	9.820E-01	3.834E+00	1.075E+03	1.154E+03	<MDL	<MDL
09/22/15	<MDL	7.723E-01	2.761E+00	1.106E+03	9.667E+02	<MDL	<MDL
10/01/15	<MDL	6.058E-01	3.395E+00	9.371E+02	7.690E+02	<MDL	<MDL
10/08/15	<MDL	5.197E-01	2.201E+00	1.403E+03	7.552E+02	<MDL	3.264E-02
10/15/15	<MDL	7.898E-01	3.092E+00	1.330E+03	1.207E+03	<MDL	4.542E-02
10/22/15	<MDL	8.427E-01	4.385E+00	1.502E+03	7.998E+02	<MDL	6.189E-02
11/01/15	<MDL	1.403E+00	6.866E+00	1.228E+03	7.308E+02	<MDL	3.755E-02
11/08/15	<MDL	7.332E-01	4.156E+00	1.413E+03	8.724E+02	<MDL	4.219E-02
11/15/15	1.921E+02	5.595E-01	2.607E+00	1.875E+03	9.201E+02	<MDL	5.141E-02
11/22/15	<MDL	4.331E-01	1.955E+00	1.278E+03	6.478E+02	<MDL	<MDL
12/01/15	<MDL	6.695E-01	1.483E+00	1.479E+03	7.316E+02	<MDL	<MDL
12/08/15	<MDL	1.324E+00	2.376E+00	2.026E+03	1.368E+03	<MDL	<MDL
12/15/15	<MDL	1.564E+00	2.598E+00	1.685E+03	1.675E+03	<MDL	<MDL
12/22/15	<MDL	6.794E-01	1.452E+00	9.292E+02	8.691E+02	<MDL	<MDL

It should be noted that the corresponding 2015 Station B filter analyses was completed in 2017.

Sample Type: FAS, Station A
Year: 2022
Analysis Performed: Metals in weekly composites

Week	Aluminum ng/m^3	Cadmium ng/m^3	Lead ng/m^3	Magnesium ng/m^3	Silicon ng/m^3	Thorium ng/m^3	Uranium ng/m^3
01/01/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/08/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/15/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/22/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/01/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/08/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/15/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/22/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/01/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/08/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/15/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/22/22	1.087E+03	6.314E-01	2.874E+00	1.909E+04	1.438E+04	1.394E-01	9.830E-02
04/01/22	8.750E+02	6.864E-01	6.958E+00	1.032E+04	2.573E+03	1.603E-01	7.171E-02
04/08/22	9.194E+02	4.033E-01	3.400E+00	2.245E+04	1.444E+04	1.262E-01	7.280E-02
04/15/22	5.459E+02	5.250E-01	3.517E+00	9.622E+03	1.677E+03	7.960E-02	3.798E-02
04/22/22	5.466E+02	4.887E-01	4.573E+00	8.790E+03	1.720E+03	8.589E-02	4.267E-02
05/01/22							
05/08/22							
05/15/22							
05/22/22							
06/01/22	2.826E+02	4.818E-01	2.843E+00	1.253E+03	9.301E+02	<MDL	2.684E-02
06/08/22	6.657E+02	4.096E-01	3.810E+00	1.221E+03	1.913E+03	9.953E-02	4.111E-02
06/15/22	5.280E+02	4.057E-01	7.106E+00	1.716E+03	1.524E+03	7.078E-02	3.541E-02
06/22/22	3.403E+02	3.728E-01	4.135E+00	1.287E+03	1.213E+03	4.684E-02	3.002E-02
07/01/22	1.707E+02	4.023E-01	5.738E+00	1.085E+03	7.141E+02	<MDL	3.315E-02
07/08/22	2.722E+02	6.184E-01	9.460E+00	1.252E+03	1.041E+03	<MDL	3.138E-02
07/15/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/22/22	3.007E+02	3.796E-01	8.452E+00	2.282E+03	9.674E+02	4.275E-02	3.170E-02
08/01/22	4.885E+02	3.592E-01	7.048E+00	1.800E+03	1.466E+03	6.331E-02	3.215E-02
08/08/22	2.981E+02	3.835E-01	7.043E+00	1.716E+03	1.094E+03	4.046E-02	2.590E-02
08/15/22	2.665E+02	6.804E-01	2.887E+00	1.552E+03	1.383E+03	<MDL	<MDL
08/22/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/01/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/08/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/15/22	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/22/22	4.349E+02	4.175E-01	7.021E+00	1.058E+04	1.296E+03	4.971E-02	3.704E-02
10/01/22							
10/08/22							
10/15/22							
10/22/22							
11/01/22							
11/08/22							
11/15/22							
11/22/22							
12/01/22							
12/08/22							
12/15/22							
12/22/22							

NOTE: Filters were not received for the following time frames: January, February, the 1st three weeks of March, one week in July, one week in August, and the 1st three weeks of September for 2022.

Sample Type: Proficiency Test
Year: 2023
Analysis Performed: Metals

ERA
A Waters Company

WS-320 Final Evaluation Report

Adrienne Chancellor
Associate Research Scientist
New Mexico State University
1400 University Dr
CEMRC
Carlsbad, NM 88220-3575
(575) 234-5525

EPA ID: Not Reported
ERA Customer Number: N215603
Report Issued: 04/24/2023
Study Dates: 03/06/2023 - 04/20/2023

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WS Metals (cat# 590, lot# S320-697)												
1000	Aluminum	µg/L	518	486	389 - 583	Acceptable	EPA 200.8 5.4 1994	4/3/2023	1.00	492	25.9	
1005	Antimony	µg/L	18.9	19.3	13.5 - 25.1	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-0.343	19.4	1.34	
1010	Arsenic	µg/L	11.7	12.1	8.47 - 15.7	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-1.18	12.6	0.729	
1015	Barium	µg/L	2175	2210	1880 - 2540	Acceptable	EPA 200.8 5.4 1994	4/3/2023	0.0606	2170	100	
1020	Beryllium	µg/L	2.23	2.22	1.89 - 2.55	Acceptable	EPA 200.8 5.4 1994	4/3/2023	0.127	2.21	0.141	
1025	Boron	µg/L		1420	1210 - 1630	Not Reported				1430	83.0	
1030	Cadmium	µg/L	35.3	35.5	28.4 - 42.6	Acceptable	EPA 200.8 5.4 1994	4/3/2023	0.273	34.9	1.60	
1040	Chromium	µg/L	38.5	42.4	36.0 - 48.8	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-1.55	41.9	2.22	
1055	Copper	µg/L	1788	1950	1760 - 2140	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-1.85	1940	79.8	
1070	Iron	µg/L	331	379	322 - 436	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-1.61	379	29.8	
1075	Lead	µg/L	16.7	18.2	12.7 - 23.7	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-1.32	18.1	1.09	
1090	Manganese	µg/L	313.5	347	295 - 399	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-2.00	350	18.4	
1100	Molybdenum	µg/L	68.9	95.1	80.8 - 109	Not Acceptable	EPA 200.8 5.4 1994	4/3/2023	-5.44	93.2	4.48	
1105	Nickel	µg/L	402	449	382 - 516	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-2.57	450	18.6	
1140	Selenium	µg/L	51.6	60.9	48.7 - 73.1	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-2.06	61.4	4.74	
1150	Silver	µg/L	189	205	144 - 266	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-1.41	205	11.2	
1165	Thallium	µg/L	8.3	8.93	6.25 - 11.6	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-0.811	8.71	0.503	
1185	Vanadium	µg/L	831	909	773 - 1050	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-1.98	902	36.0	
1190	Zinc	µg/L	1286	1360	1160 - 1560	Acceptable	EPA 200.8 5.4 1994	4/3/2023	-1.04	1360	70.0	

Sample Type: Surface Water
Year: 2023
Analysis Performed: Anions

Analyzed for 3/9 locations, but data not available for reporting until SW collection is complete

Sample Type: Surface Water
Year: 2023
Analysis Performed: Cations

Analyzed for 3/9 locations, but data not available for reporting until SW collection is complete

Sample Type: Surface Water
Year: 2023
Analysis Performed: Metals

Analyzed for 3/9 locations, but data not available for reporting until SW collection is complete

Sample Type: Surface Water
Year: 2023
Analysis Performed: pH

Sample Location	pH @ xxx°C
Hill Tank	7.78
Noya Tank	7.87
Red Tank	8.01
Lake Carlsbad (Shallow)	
Lake Carlsbad (Deep)	
Brantley Lake (Shallow)	
Brantley (Deep)	
Red Bluff (Shallow)	
Red Bluff (Deep)	

Sample Type: Surface Water
Year: 2023
Analysis Performed: Conductivity

Sample Location	Conductivity mS/cm	Temperature °C
Hill Tank	0.758	22.5
Noya Tank	0.483	22.7
Red Tank	0.280	22.7
Lake Carlsbad (Shallow)		
Lake Carlsbad (Deep)		
Brantley Lake (Shallow)		
Brantley Lake(Deep)		
Red Bluff (Shallow)		
Red Bluff (Deep)		

Sample Type: Surface Water
Year: 2023
Analysis Performed: Specific gravity

Sample Location	SG $_{T/4°C}$
Hill Tank	1.000
Noya Tank	1.001
Red Tank	1.000
Lake Carlsbad (Shallow)	
Lake Carlsbad (Deep)	
Brantley Lake (Shallow)	
Brantley (Deep)	
Red Bluff (Shallow)	
Red Bluff (Deep)	

Sample Type: Surface Water
Year: 2023
Analysis Performed: TOC/TN/TIC

Sample Location	TOC mg/L	TIC mg/L	TN mg/L
Hill Tank	32.70	66.33	15.45
Noya Tank	20.20	36.18	14.20
Red Tank	9.13	19.15	2.16
Lake Carlsbad (Shallow)			
Lake Carlsbad (Deep)			
Brantley Lake (Shallow)			
Brantley (Deep)			
Red Bluff (Shallow)			
Red Bluff (Deep)			

Sample Type: Surface Water
Year: 2023
Analysis Performed: TDS/TSS

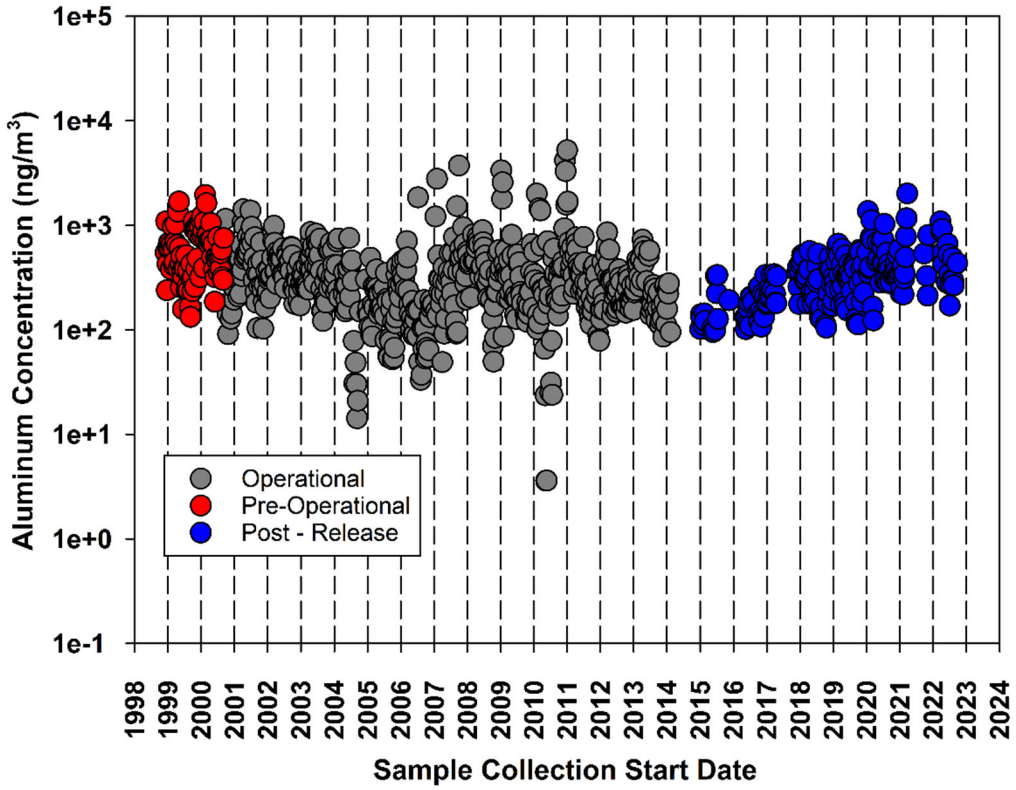
Sample Location	TDS mg/L	TSS mg/L
Hill Tank	520	320
Noya Tank	420	960
Red Tank	380	120
Lake Carlsbad (Shallow)		
Lake Carlsbad (Deep)		
Brantley Lake (Shallow)		
Brantley (Deep)		
Red Bluff (Shallow)		
Red Bluff (Deep)		

Sample Type: Near Field, ambient air
Year: 2023
Analysis Performed: Cations

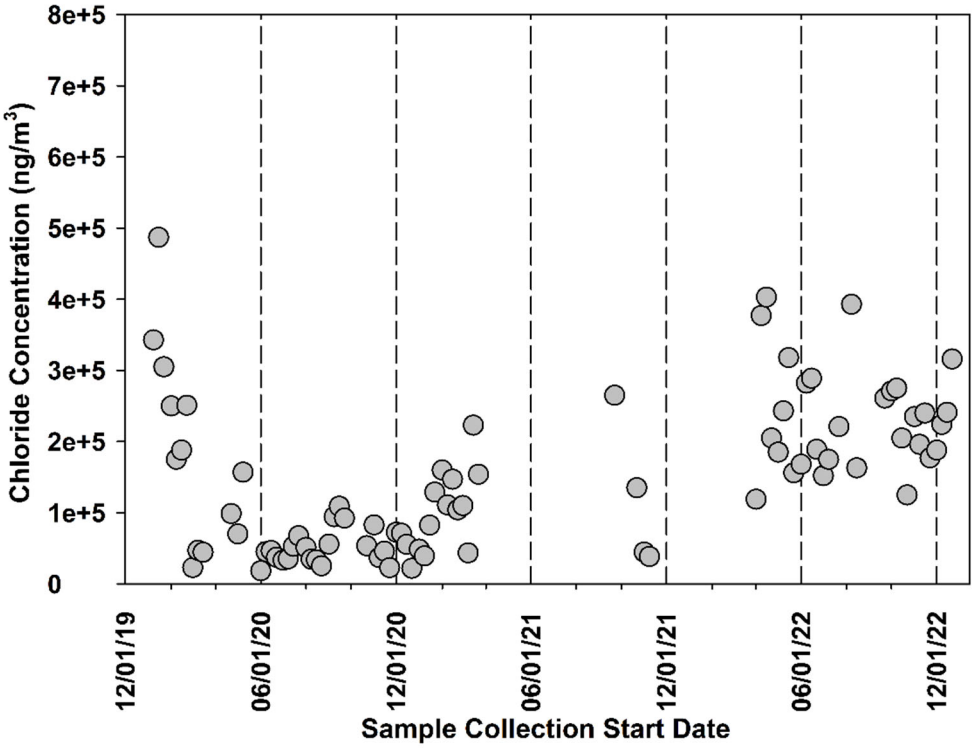
Start Date	Sodium µg/m³	Magnesium µg/m³	Potassium µg/m³	Calcium µg/m³
01/06/23	1.90E-01	7.68E-02	1.51E-01	6.71E-01
01/27/23	3.34E-01	7.55E-02	1.08E-01	9.68E-01
03/01/23	3.13E-01	8.27E-02	3.40E-01	8.76E-01
03/29/23	3.78E-01	8.95E-02	2.35E-01	9.06E-01

Sample Type: Cactus Flats, ambient air
Year: 2023
Analysis Performed: Cations

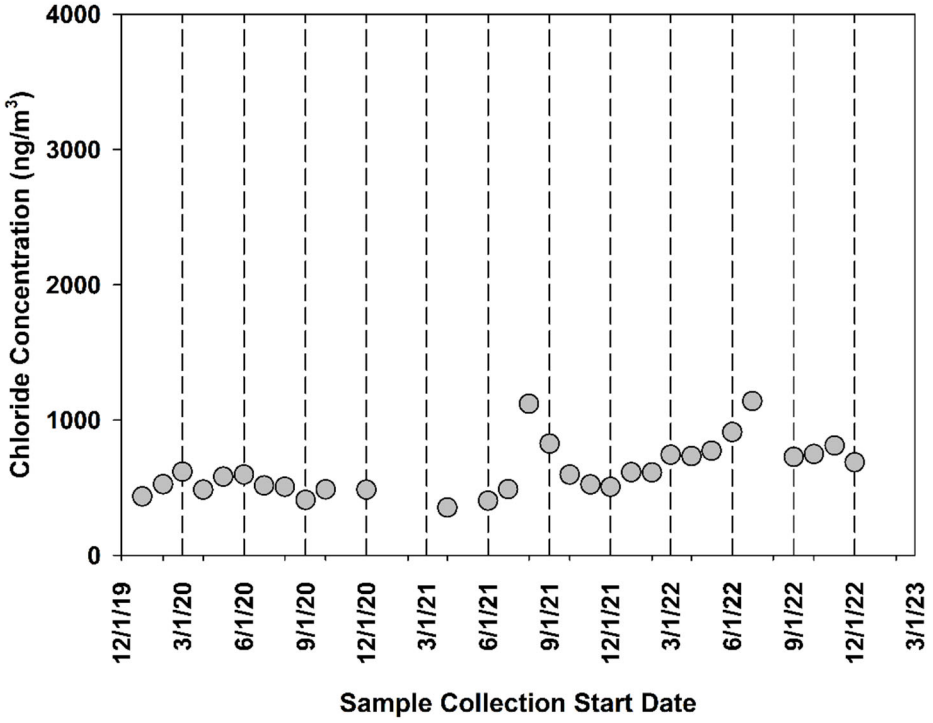
Start Date	Sodium µg/m³	Magnesium µg/m³	Potassium µg/m³	Calcium µg/m³
01/06/23	2.37E-01	5.36E-02	6.74E-02	8.82E-01
01/27/23	2.40E-01	5.33E-02	6.90E-02	1.14E+00
03/01/23	1.96E-01	5.74E-02	2.10E-01	9.85E-01
03/29/23	2.07E-01	6.73E-02	2.33E-01	1.11E+00



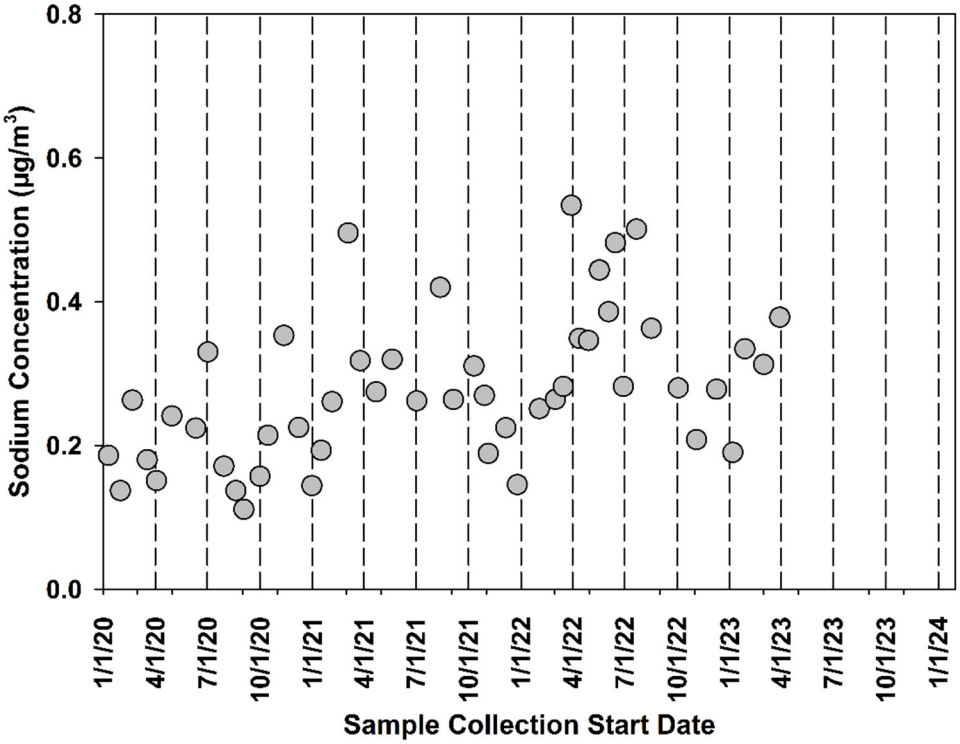
FAS, Station A, 1998-2022 (aluminum)



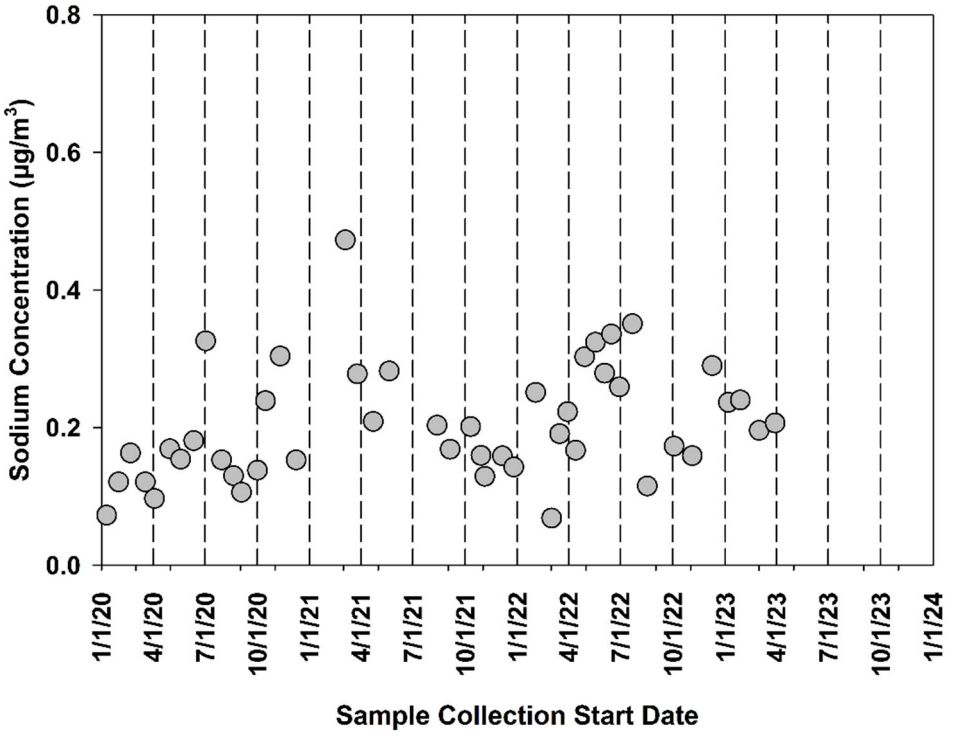
FAS, Station A, 2020-2022 (chloride)



FAS, Station B, 2020-2022 (chloride)



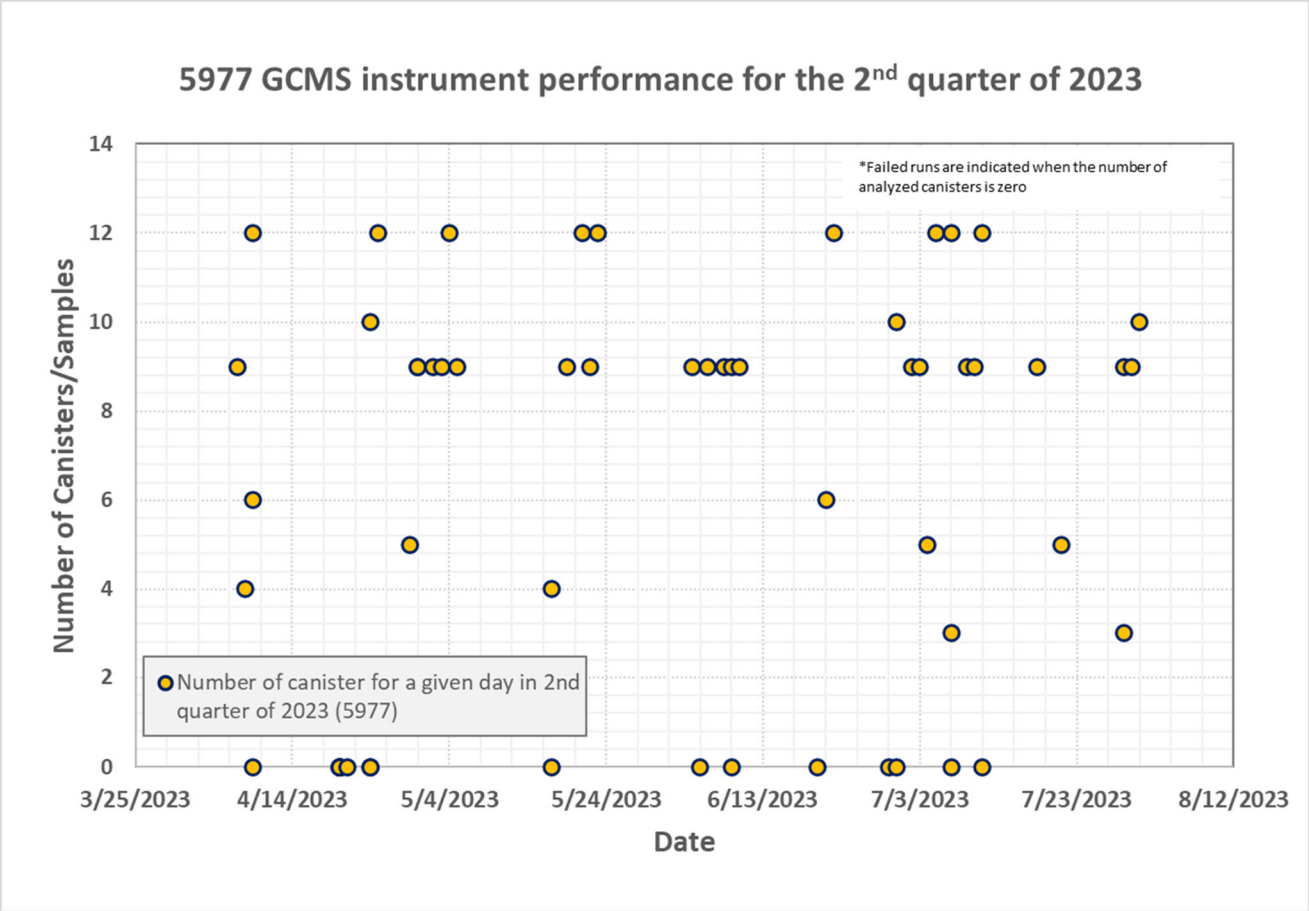
Ambient Air, Near Field, 2020-2023 (sodium)



Ambient Air, Cactus Flats, 2020-2023 (sodium)

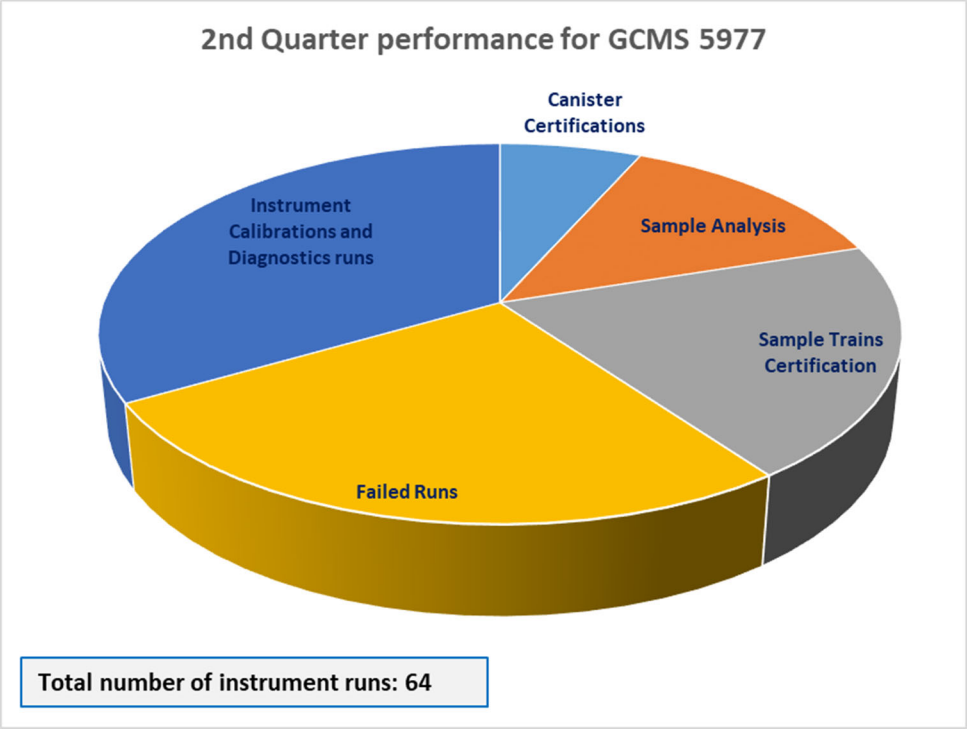
Organic Chemistry Group

The Organic Chemistry group (OC) is monitoring the air quality at the surface and underground at the WIPP site with respect to volatile organic compounds (VOCs). The following graphs show the analyses performed during the second quarter of 2023.

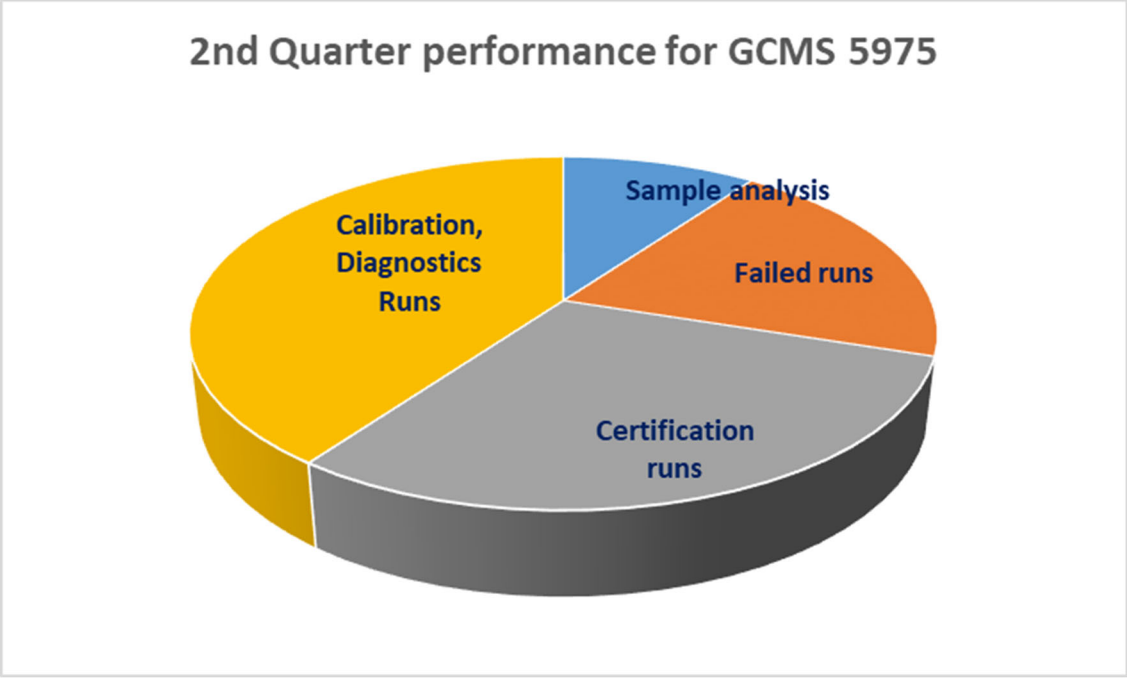


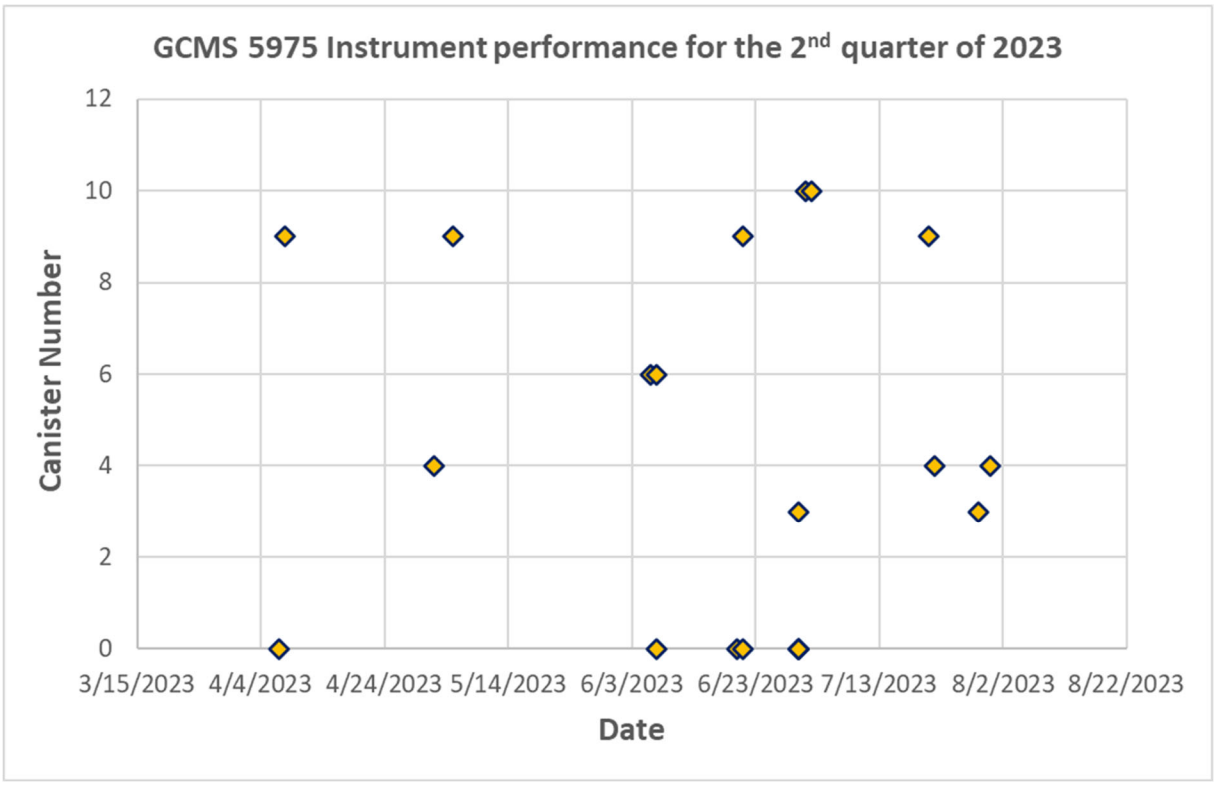
It should be noted that two of the instruments used for screening and for underground samples are quite old and this leads to many failed runs and loss of productivity, as can be seen in the figure below. The instrument referred to above is the newer instrument and is used for the analysis of the above ground, ambient samples.

The total number of packages analyzed during the second quarter of 2023 was 59.



Analysis of the corresponding runs with the older instrument, used for underground sample analysis, is presented below.




GCMS 5975 Instrument performance for the 2nd quarter of 2023
Canister Number
12
10
8
6
4
2
0
3/15/2023
4/4/2023
4/24/2023
5/14/2023
6/3/2023
6/23/2023
7/13/2023
8/2/2023
8/22/2023
Date

Internal Dosimetry Group

CEMRC Lung and Whole-Body APEX In-Vivo radiobioassay measurement system:
Performed successfully the efficiency calibration of CEMRC Lung and Whole-Body APEX *In-vivo* radiobioassay measurement system for external quality control geometry during April-June 2023.

Number of *in vivo* radiobioassay measurements performed during the reporting period: 12 for WIPP, 22 for the contract radiological personnel and those working in the laboratories located at CEMRC, and 1 for the Public participants.

Outreach activities:
The Internal Dosimetry group continues to interact with the general public to encourage participation in the Lie Down and Be Counted (LDBC) project's lung and whole-body in-vivo radiobioassay measurements at CEMRC. CEMRC also promotes awareness of environmental monitoring and research to the general public.

Specifically, during the second quarter of 2023, the following activities took place:

June 9, 2023: The Internal Dosimetry group (ID) laboratory manager went to the Carlsbad Fire stations, to meet the fire chiefs and personnel, talk to them face to face about the LDBC program, distribute brochures, and collect some contact information. Unfortunately, no one was available at the following three Fire Station locations.

i) La Huerta FD Station 1, 1724 Muscatel Ave, Carlsbad NM (575) 887-6353.
ii) 115 N La Huerta Circle, Carlsbad, NM, (575) 689-8530.
iii) FD 2, 2416 W Church St, Carlsbad, NM, (575) 887-3820.

June 15, 2023: The ID laboratory manager was able to talk to Ms. Alysha Vasquez at the administrative office, 401 S Halagueno, Carlsbad Fire Department Administrative Office, (575) 885-3125 and gave her the brochures to give to the fire chiefs. Talked to her about the LDBC program. Ms. Vasquez said to contact her again to set up an appointment with one of the fire chiefs. The ID laboratory manager will follow up.