Quarterly Report

Calendar Year 2023 – First Quarter, January 1 – March 31, 2023

Prepared by:

Carlsbad Environmental Monitoring & Research Center
under a financial assistance grant from
U.S. Department of Energy
Carlsbad Field Office (CBFO)
Award No. DE-EM0005195

Submitted to:

U.S. Department of Energy
Carlsbad Field Office

April 2023

Field Programs/Radiation Safety Group

WIPP Underground Effluent Monitoring (Station A and Station B)

From January 1st to March 31st, a total of 142 filters were collected from the primary skid at Station A, of which 118 were sample filters, 12 were trip blanks and 12 were filter blanks. 132 filters were also collected from the backup skid at Station A (108 sample, 12 trip blanks and 12 blanks). 112 filters have been collected from the primary skid at Station B, (88 sample filters, 12 trip blanks and 12 filter blanks). 112 filters were collected from Station B backup (88 sample, 12 trip blanks and 12 filter blanks), during the same time period.

All fixed air sampler (FAS) filters from the primary and backup skids at Station A and Station B have been processed (gravimetrics, sample flow volume, and mass concentration have been calculated in the FP data package) and transferred to the radiochemistry (RC) and environmental chemistry (EC) groups, except for the last week of March, which is in process.

Ambient Air Sampling

From January 1st to March 31st 18 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. Twelve of the 18 filter samples have been processed (gravimetrics, total air flow values, and any irregularities note) by FP and transferred to RC. The remaining 6 are in the desiccator.

6 Whatman-41 filters and 3 trip blank filters were collected from January 1st to March 31st from the 2 sampling sites (Near Field, Cactus Flats) using a high-volume sampler. All filter samples have been processed (total air flow values and any irregularities note) by FP and transferred to EC.

Soil sampling

Four (3 samples and 1 duplicate) soil samples were collected during the month of March, these samples were collected with WIPP personnel.

Surface water Monitoring

Surface water sampling will begin in the 2nd or 3rd quarter.

Drinking water Monitoring

Drinking water samples are scheduled to be collected in June or July.

Sediment Monitoring

Sediment sampling will begin in the 2nd or 3rd quarter.

Nuclear Materials Management and Safeguards

From January 1st to March 31st radiation safety (RS) has collected and bulked radioactive waste from NMSU, LANL and the LATA (WIPP Labs) groups working in this facility.

RS has performed monthly surveys of all Rad labs in the building, which include smears and dose rate measurements. All fume hoods are face velocity checked quarterly; the date of the last inspection was 03/22/2023. The XLB, where the smears are counted was calibrated on 5/25/22. Several survey instruments have been sent off to Ludlum for calibration. A Rad waste pickup is scheduled for the first week of April 2023.

FP personnel have been working with the RC group to locate archived samples for reanalysis, along with performing work in the laboratory and helping with the gamma spectroscopy.

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 HEPA (high-efficiency particulate air) 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 the third week of March 2023. The analysis of the fourth week of March is currently underway and will be completed by the end of this week. The complete results for the months of January and February have been submitted to CBFO. The results for the month of March will be submitted to CBFO by the end of this week.

Vegetation Analysis

The analysis of vegetation samples from 2021 for actinides (U, Pu, and ^{241}Am isotopes) has been completed. The analysis of vegetation samples from 2021 for gamma-ray emitters (^{60}Co, ^{137}Cs, and ^{40}K) will be completed this week. The analysis of vegetation samples for ^{90}Sr is included below with ^{90}Sr analysis for the other environmental media.

Other Environmental Media

Analysis of ^{90}Sr in environmental media is currently underway for calendar years 2020 and 2021. The total number of samples is broken down as follows:

Medium	2020 Samples	2021 Samples
Drinking Water	8	8
Surface Water	9	12
Sediment	4	4
Soil	18	18
Hi-Vol	88	78
FAS Station A	44	46
FAS Station B	12	12
Vegetation	0	6
Total	**183**	**184**

As soon as the backlog of samples from calendar years 2020 and 2021 is cleared, analysis of samples from calendar year 2022 will begin.

Environmental Chemistry Group

From January 1 through March 31, 2023, the Environmental Chemistry (EC) Group worked on the following:

Analysis Type	Status
2023 detection limits	Complete – all up to date
2022 FAS Station A, metals	Complete through May
2022 FAS Station A, anions	Complete
2022 FAS Station B, anions	Complete
2022 FAS Station B, cations	Complete
2022 Whatman (Hi-Vol), anions	Complete
2017 FAS Station B, metals	Complete
Proficiency test (anions, cations, mercury)	Complete (passed)

The goals of the EC Group for the 2nd quarter include the following:

1. Last proficiency test for 2023: metals
2. FAS Backlog:
    a. 2016 FAS Station A, metals
    b. 2015 FAS Station A, metals
3. Whatman backlog:
    a. 2020 Whatman, metals
    b. 2021 Whatman, metals

The following Tables and Figures represent characteristic results.

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	Silica 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							
06/08/22							
06/15/22							
06/22/22							
07/01/22							
07/08/22							
07/15/22							
07/22/22							
08/01/22							
08/08/22							
08/15/22							
08/22/22							
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							

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

Week	Chloride ng/m^3	Nitrate ng/m^3	Phosphate ng/m^3	Sulfate ng/m^3
01/01/22	N/A	N/A	N/A	N/A
01/08/22	N/A	N/A	N/A	N/A
01/15/22	N/A	N/A	N/A	N/A
01/22/22	N/A	N/A	N/A	N/A
02/01/22	N/A	N/A	N/A	N/A
02/08/22	N/A	N/A	N/A	N/A
02/15/22	N/A	N/A	N/A	N/A
02/22/22	N/A	N/A	N/A	N/A
03/01/22	N/A	N/A	N/A	N/A
03/08/22	N/A	N/A	N/A	N/A
03/15/22	N/A	N/A	N/A	N/A
03/22/22	1.82E+06	<MDL	<MDL	7.52E+04
04/01/22	1.19E+05	<MDL	<MDL	1.85E+04
04/08/22	3.77E+05	<MDL	<MDL	6.45E+04
04/15/22	4.03E+05	<MDL	<MDL	2.69E+04
04/22/22	2.05E+05	<MDL	<MDL	1.85E+04
05/01/22	1.85E+05	6.08E+02	<MDL	2.18E+04
05/08/22	2.43E+05	7.04E+02	<MDL	4.07E+04
05/15/22	3.18E+05	6.11E+02	<MDL	3.42E+04
05/22/22	1.56E+05	<MDL	4.39E+03	1.80E+04
06/01/22	1.68E+05	6.83E+02	<MDL	9.29E+03
06/08/22	2.82E+05	7.07E+02	<MDL	2.45E+04
06/15/22	2.89E+05	7.42E+02	<MDL	2.22E+04
06/22/22	1.89E+05	6.15E+02	<MDL	2.38E+04
07/01/22	1.52E+05	<MDL	<MDL	3.72E+04
07/08/22	1.75E+05	<MDL	<MDL	3.90E+04
07/15/22	N/A	N/A	N/A	N/A
07/22/22	2.21E+05	7.10E+02	<MDL	2.15E+04
08/01/22	1.03E+06	<MDL	<MDL	1.69E+04
08/08/22	3.93E+05	6.37E+02	<MDL	1.74E+04
08/15/22	1.63E+05	<MDL	<MDL	1.44E+04
08/22/22	N/A	N/A	N/A	N/A
09/01/22	N/A	N/A	N/A	N/A
09/08/22	N/A	N/A	N/A	N/A
09/15/22	N/A	N/A	N/A	N/A
09/22/22	2.61E+05	<MDL	<MDL	1.57E+04
10/01/22	2.71E+05	<MDL	<MDL	1.23E+04
10/08/22	2.75E+05	<MDL	<MDL	1.31E+04
10/15/22	2.05E+05	<MDL	<MDL	1.91E+04
10/22/22	1.25E+05	<MDL	<MDL	2.31E+04
11/01/22	2.35E+05	2.08E+02	<MDL	6.27E+04
11/08/22	1.96E+05	2.38E+02	<MDL	3.43E+04
11/15/22	2.40E+05	2.95E+02	<MDL	5.06E+04
11/22/22	1.77E+05	<MDL	<MDL	2.06E+04
12/01/22	1.88E+05	<MDL	<MDL	2.75E+04
12/08/22	2.24E+05	<MDL	<MDL	2.30E+04
12/15/22	2.41E+05	2.63E+02	<MDL	5.96E+04
12/22/22	3.16E+05	1.89E+02	<MDL	2.27E+04

Sample Type: FAS, Station B
Year: 2022
Analysis Performed: Anions in monthly composites

Sample Date	Chloride ng/m^3	Nitrate ng/m^3	Phosphate ng/m^3	Sulfate ng/m^3
January	6.14E+02	<MDL	<MDL	<MDL
February	6.12E+02	<MDL	<MDL	2.12E+02
March	7.43E+02	<MDL	<MDL	<MDL
April	7.33E+02	<MDL	<MDL	2.54E+02
May	7.73E+02	<MDL	<MDL	<MDL
June	9.11E+02	<MDL	<MDL	3.25E+02
July	1.14E+03	<MDL	<MDL	2.32E+02
August	N/A	N/A	N/A	N/A
September	7.27E+02	<MDL	<MDL	2.51E+02
October	7.48E+02	<MDL	<MDL	<MDL
November	8.11E+02	<MDL	<MDL	<MDL
December	6.87E+02	<MDL	<MDL	2.51E+02

Sample Type: FAS, Station B
Year: 2022
Analysis Performed: Cations in monthly composites

Sample Date	Sodium ng/m^3	Ammonium ng/m^3	Magnesium ng/m^3	Potassium ng/m^3	Calcium ng/m^3
January	<MDL	<MDL	<MDL	<MDL	<MDL
February	<MDL	<MDL	<MDL	<MDL	<MDL
March	<MDL	<MDL	3.25E+01	<MDL	1.47E+02
April	<MDL	<MDL	<MDL	<MDL	5.30E+01
May	<MDL	<MDL	<MDL	<MDL	1.42E+02
June	<MDL	<MDL	<MDL	<MDL	1.18E+02
July	<MDL	<MDL	<MDL	<MDL	<MDL
August	N/A	N/A	N/A	N/A	N/A
September	<MDL	<MDL	<MDL	<MDL	3.94E+01
October	<MDL	<MDL	<MDL	<MDL	2.16E+01
November	<MDL	<MDL	<MDL	<MDL	<MDL
December	<MDL	<MDL	<MDL	<MDL	<MDL

Sample Type: Near Field, ambient air
Year: 2022
Analysis Performed: Anions

Start Date	Chloride µg/m³	Nitrate µg/m³	Phosphate µg/m³	Sulfate µg/m³
2/22/22	2.37E-01	2.39E+00	1.32E-02	1.52E+00
3/2/22	2.43E-01	1.66E+00	6.80E-03	1.46E+00
3/16/22	3.10E-01	1.85E+00	1.80E-02	1.28E+00
3/30/22	4.83E-01	1.85E+00	1.80E-02	1.28E+00
4/13/22	3.93E-01	2.15E+00	1.40E-02	2.23E+00
4/29/22	2.33E-01	1.66E+00	<MDL	1.89E+00
5/18/22	3.39E-01	1.97E+00	1.37E-02	1.79E+00
6/3/22	1.35E-01	1.81E+00	<MDL	2.14E+00
6/15/22	3.98E-01	2.26E+00	<MDL	1.52E+00
6/29/22	9.87E-02	1.73E+00	8.52E-03	1.46E+00
7/22/22	2.39E-01	1.88E+00	<MDL	1.89E+00
8/17/22	2.30E-01	1.76E+00	8.05E-03	1.56E+00
10/3/22	3.09E-01	2.37E+00	7.45E-03	1.50E+00
11/04/22	2.48E-01	1.92E+00	3.89E-03	1.29E+00
12/09/22	2.30E-01	1.80E+00	4.15E-03	1.80E+00

Sample Type: Cactus Flats, ambient air
Year: 2022
Analysis Performed: Anions

Start Date	Chloride µg/m³	Nitrate µg/m³	Phosphate µg/m³	Sulfate µg/m³
2/22/22	2.52E-01	2.55E+00	7.60E-03	1.26E+00
3/2/22	5.09E-02	7.30E-01	2.44E-03	3.27E-01
3/16/22	2.22E-01	1.14E+00	<MDL	1.09E+00
3/30/22	1.65E-01	1.21E+00	1.17E-02	9.35E-01
4/13/22	1.57E-01	1.55E+00	5.86E-03	8.77E-01
4/29/22	2.43E-01	1.51E+00	9.88E-03	1.74E+00
5/18/22	2.75E-01	1.68E+00	9.61E-03	1.41E+00
6/3/22	1.08E-01	1.32E+00	5.98E-03	1.62E+00
6/15/22	2.63E-01	1.60E+00	5.95E-03	1.20E+00
6/29/22	9.40E-02	1.46E+00	1.19E-02	1.37E+00
7/22/22	1.10E-01	2.08E+00	4.46E-03	1.43E+00
8/17/22	5.08E-02	1.10E+00	7.08E-03	1.26E+00
10/3/22	1.41E-01	2.36E+00	<MDL	1.22E+00
11/04/22	1.42E-01	1.40E+00	2.87E-03	9.84E-01
12/09/22	2.47E-01	1.65E+00	2.46E-03	1.71E+00

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

WS-318 Final Evaluation Report

A Waters Company

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EPA ID: Not Reported
ERA Customer Number: N215603
Report Issued: 02/27/2023
Study Dates: 01/09/2023 - 02/23/2023

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 Hardness (cat# 555, lot# S318-693)												
1035	Calcium	mg/L	73.1	72.1	61.3 - 82.9	Acceptable	ASTM D6919-09 2009	2/2/2023	0.725	71.1	2.71	
1085	Magnesium	mg/L	11.9	11.7	9.94 - 13.5	Acceptable	ASTM D6919-09 2009	2/2/2023	0.359	11.7	0.494	
1155	Sodium	mg/L	23.7	22.2	18.9 - 25.5	Acceptable	ASTM D6919-09 2009	2/2/2023	1.20	22.4	1.08	
1550	Calcium Hardness as CaCO3	mg/L	182.8	180	153 - 207	Acceptable	ASTM D6919-09 2009	2/2/2023	0.767	177	7.15	
1755	Total Hardness as CaCO3	mg/L	231.7	228	194 - 262	Acceptable	ASTM D6919-09 2009	2/2/2023	0.797	226	7.52	

Sample Type: Proficiency Test
Year: 2023
Analysis Performed: Inorganics & Mercury

WS-319 Final Evaluation Report

A Waters Company

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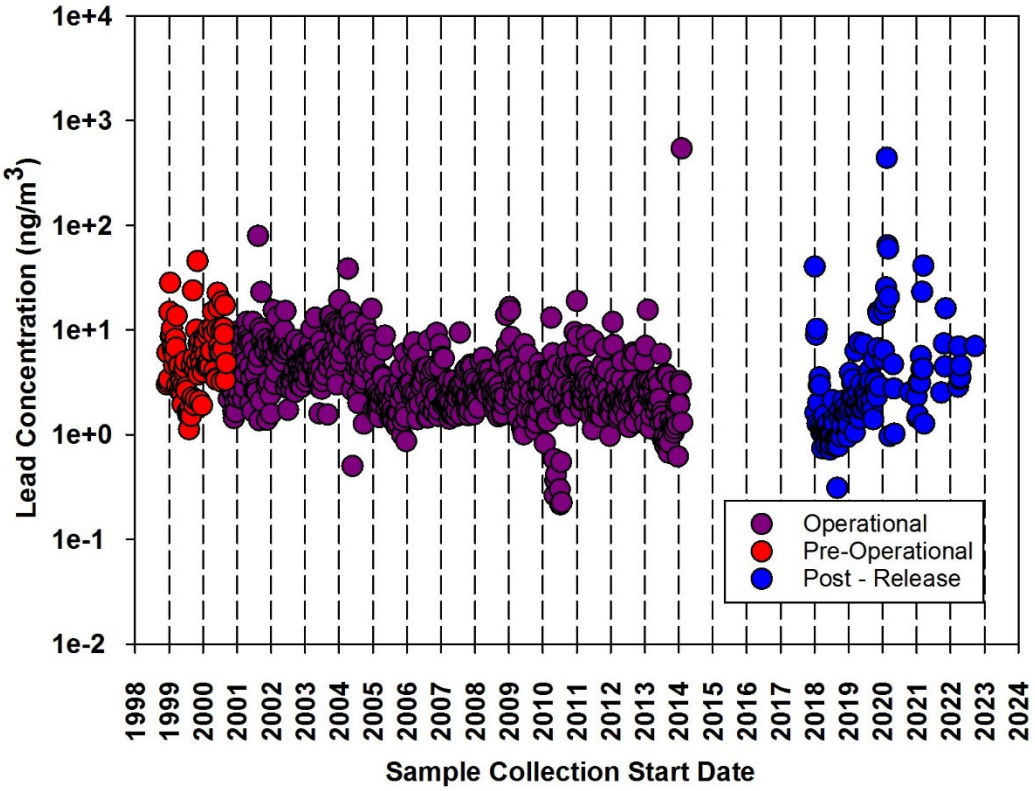
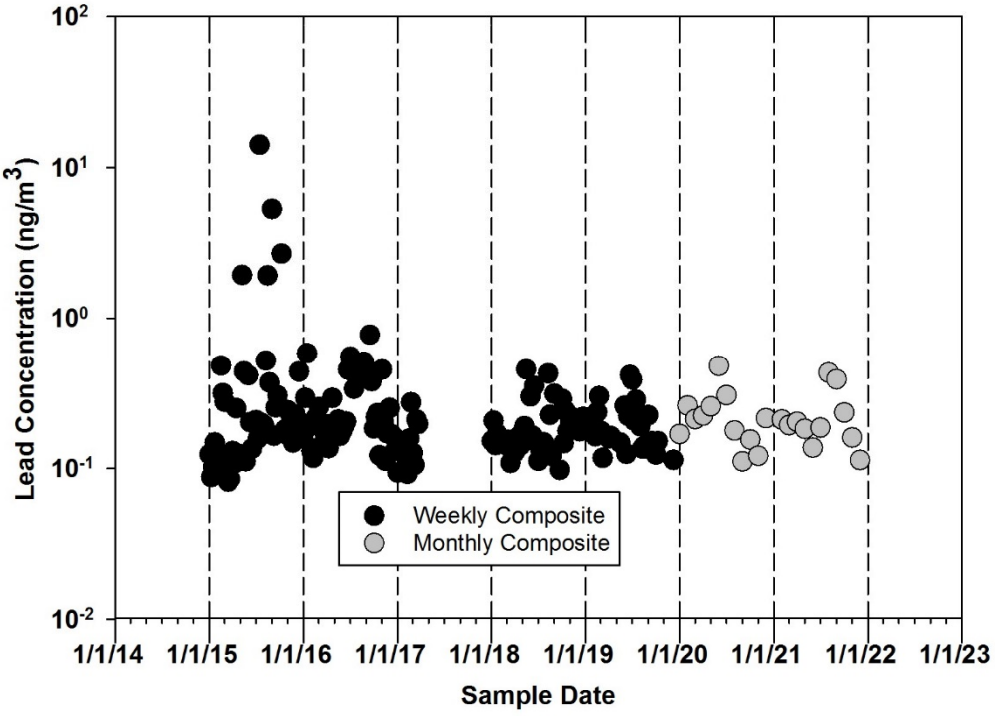
EPA ID: Not Reported
ERA Customer Number: N215603
Report Issued: 03/27/2023
Study Dates: 02/06/2023 - 03/23/2023

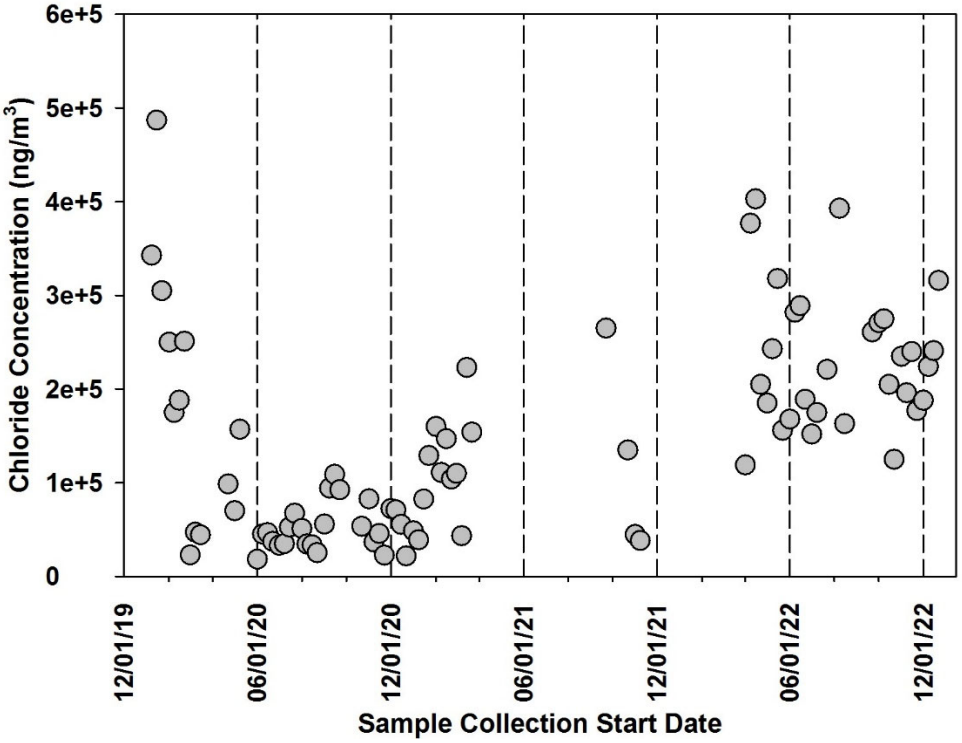
TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WS Inorganics (cat# 591, lot# S319-698)												
1505	Alkalinity as CaCO3	mg/L		95.2	85.7 - 105	Not Reported				96.4	4.03	
1575	Chloride	mg/L	96.7	91.3	77.6 - 105	Acceptable	EPA 300.0 2.1 1993	2/15/2023	1.97	91.6	2.58	
1610	Conductivity at 25°C	µmhos/cm		895	806 - 985	Not Reported				892	10.5	
1730	Fluoride	mg/L	3.5	3.35	3.02 - 3.68	Acceptable	EPA 300.0 2.1 1993	2/15/2023	0.685	3.37	0.188	
1820	Nitrate + Nitrite as N	mg/L		5.17	4.39 - 5.95	Not Reported				5.11	0.218	
1810	Nitrate as N	mg/L	5.3	5.17	4.65 - 5.69	Acceptable	EPA 300.0 2.1 1993	2/15/2023	0.830	5.08	0.265	
1125	Potassium	mg/L		21.3	18.1 - 24.5	Not Reported				21.2	1.03	
2000	Sulfate	mg/L	156.9	153	130 - 176	Acceptable	EPA 300.0 2.1 1993	2/15/2023	0.599	153	6.29	
1955	Total Dissolved Solids at 180°C	mg/L		634	507 - 761	Not Reported				611	35.2	
WS Mercury (cat# 551, lot# S319-666)												
1095	Mercury	µg/L	1.4	1.81	1.27 - 2.35	Acceptable	EPA 200.8 5.4 1994	3/10/2023	-1.72	1.80	0.235	



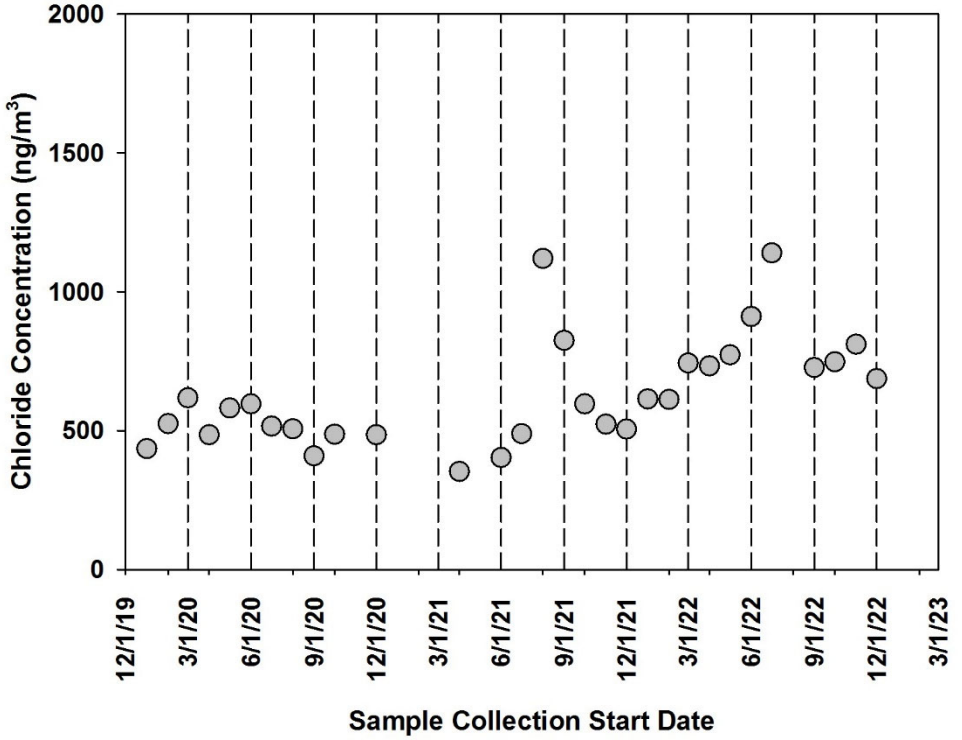
FAS, Station A, Lead



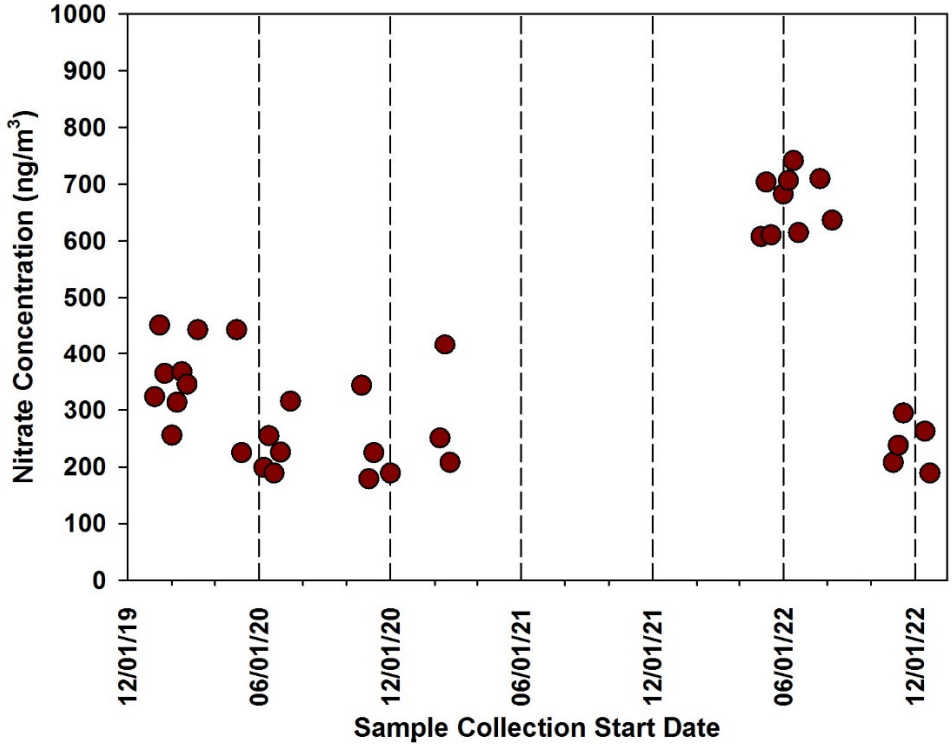
FAS, Station B, Lead



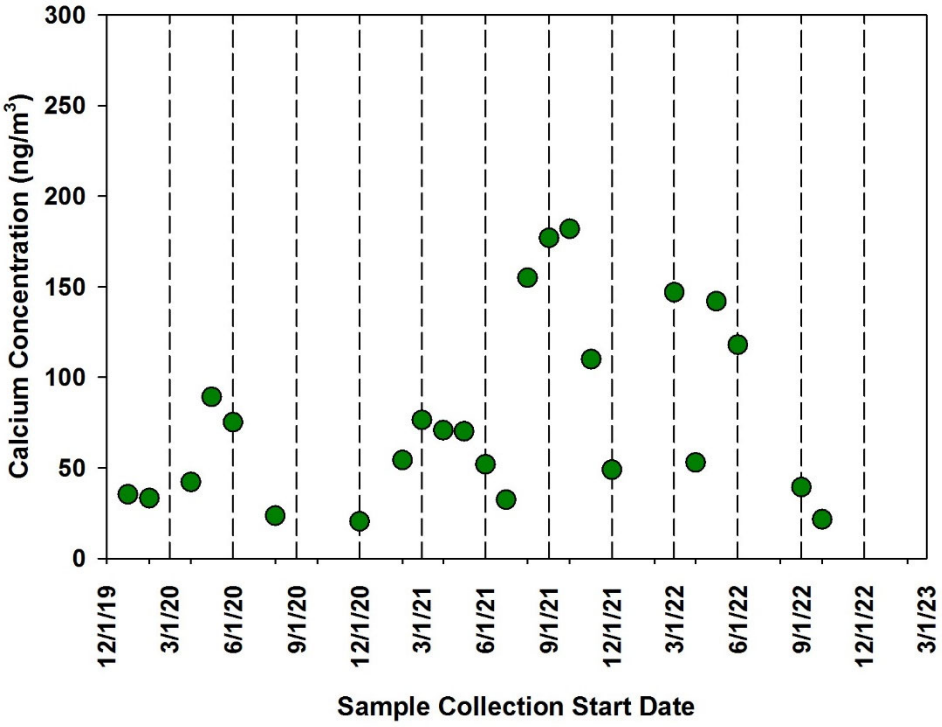
FAS, Station A, Chloride



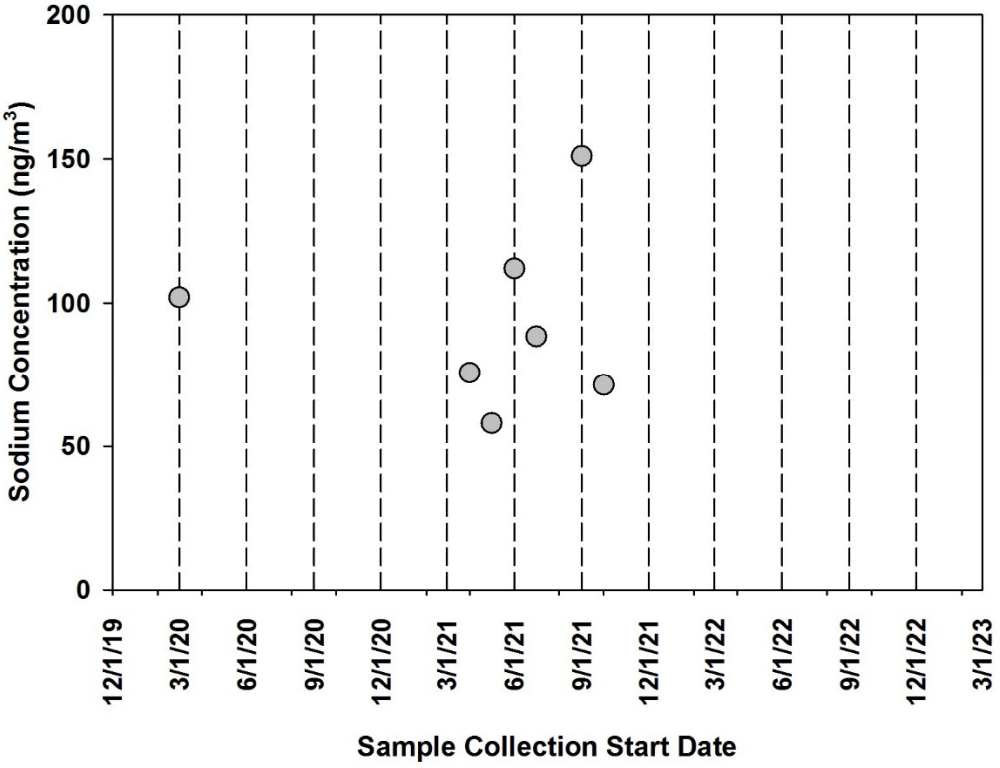
FAS, Station B, Chloride



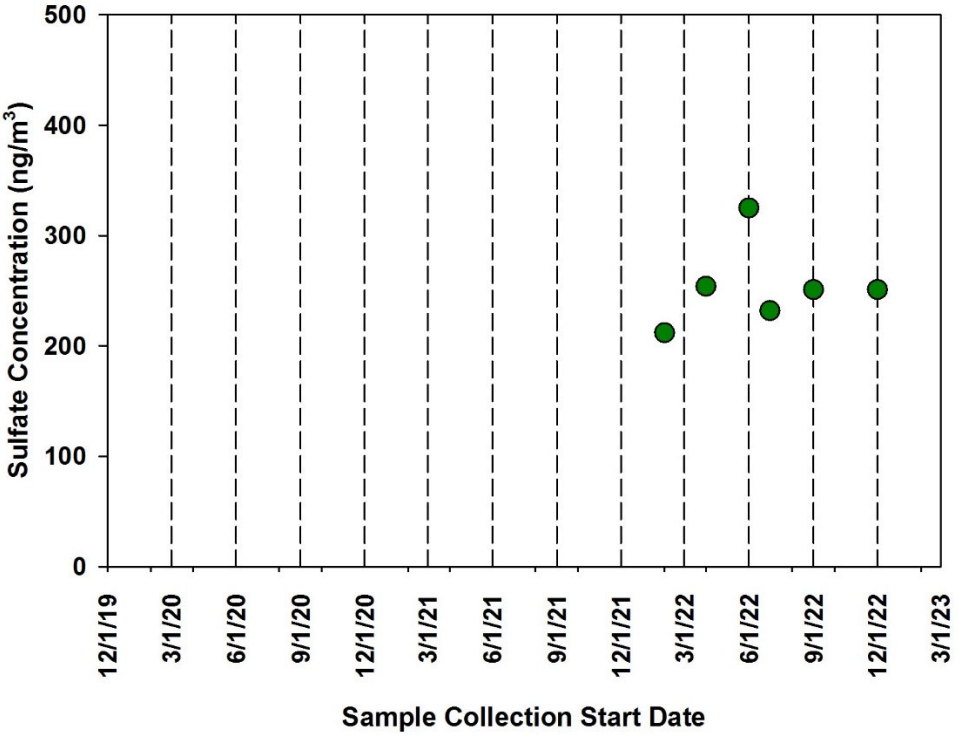
FAS, Station A, Nitrate



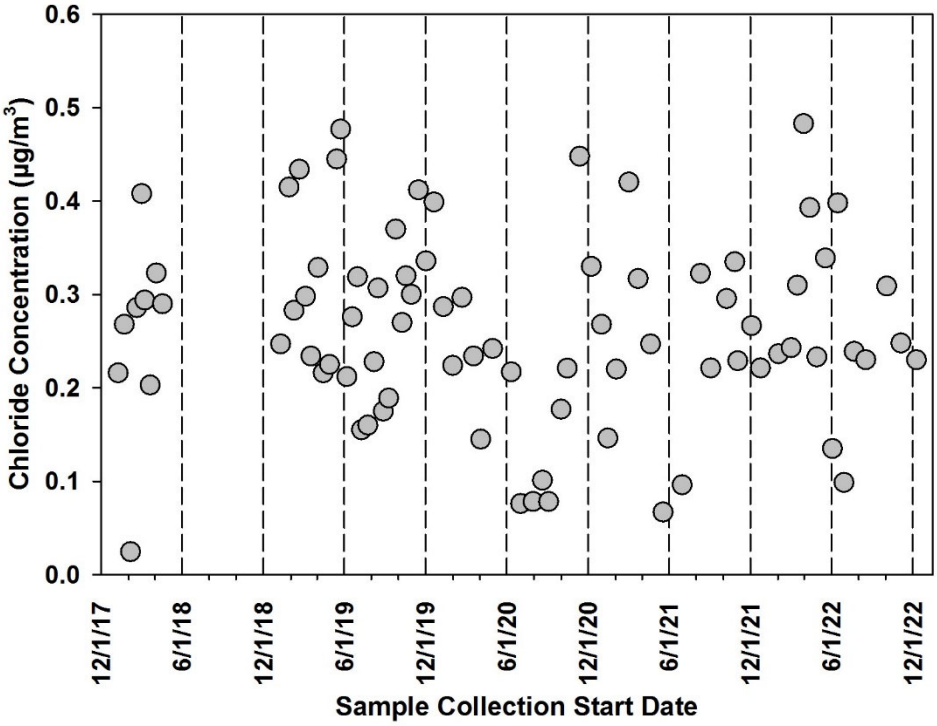
FAS, Station B, Calcium



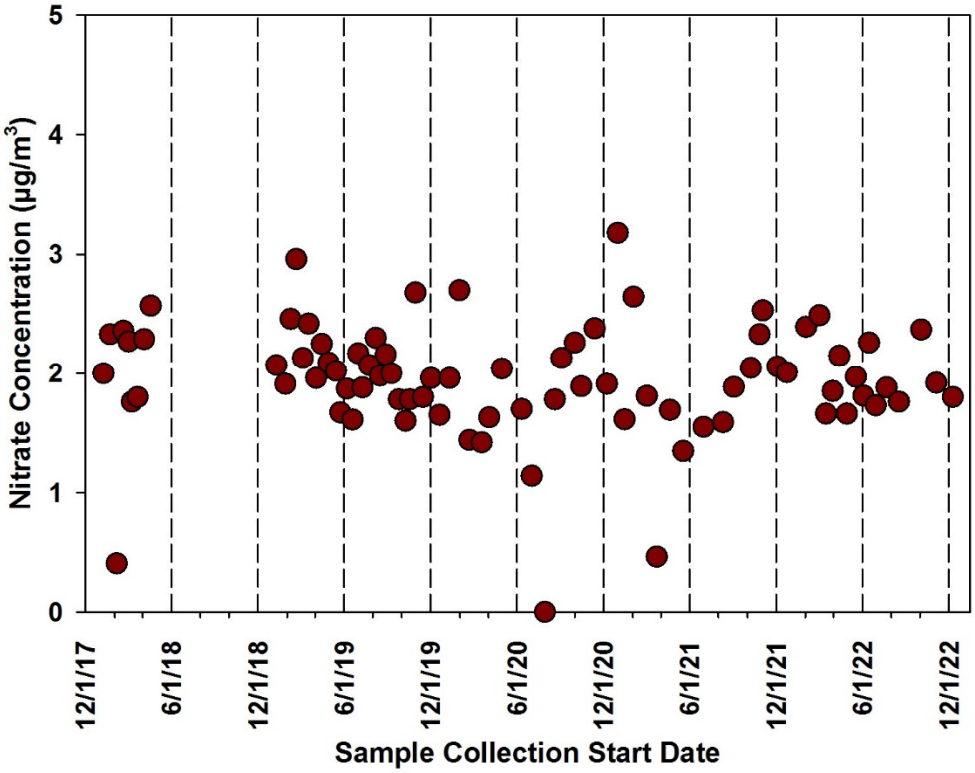
FAS, Station B, Sodium



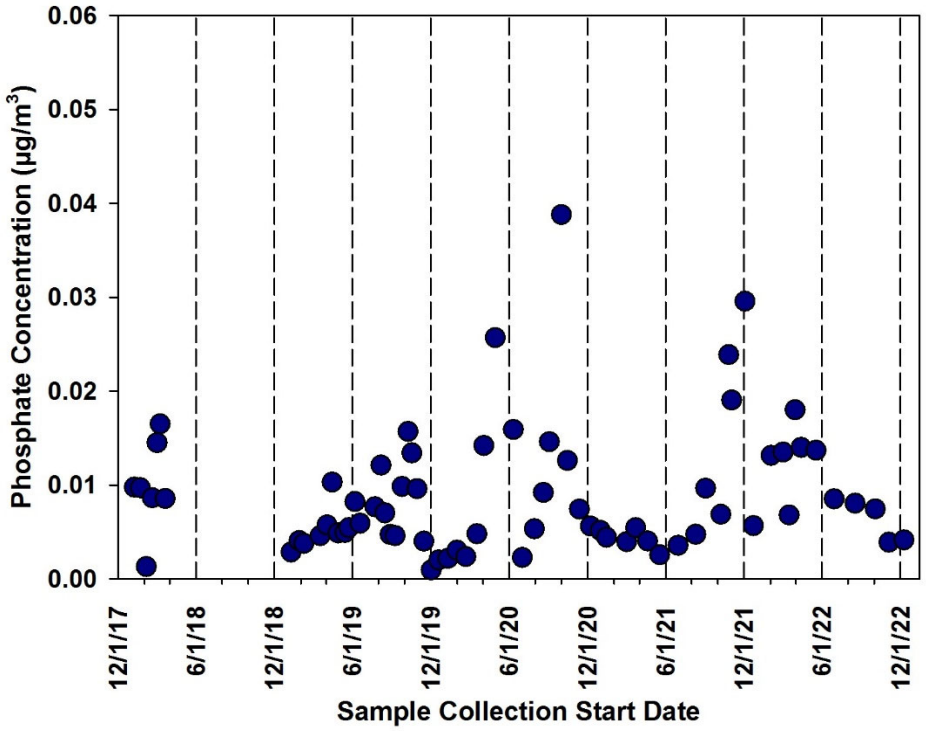
FAS, Station B, Sulfate



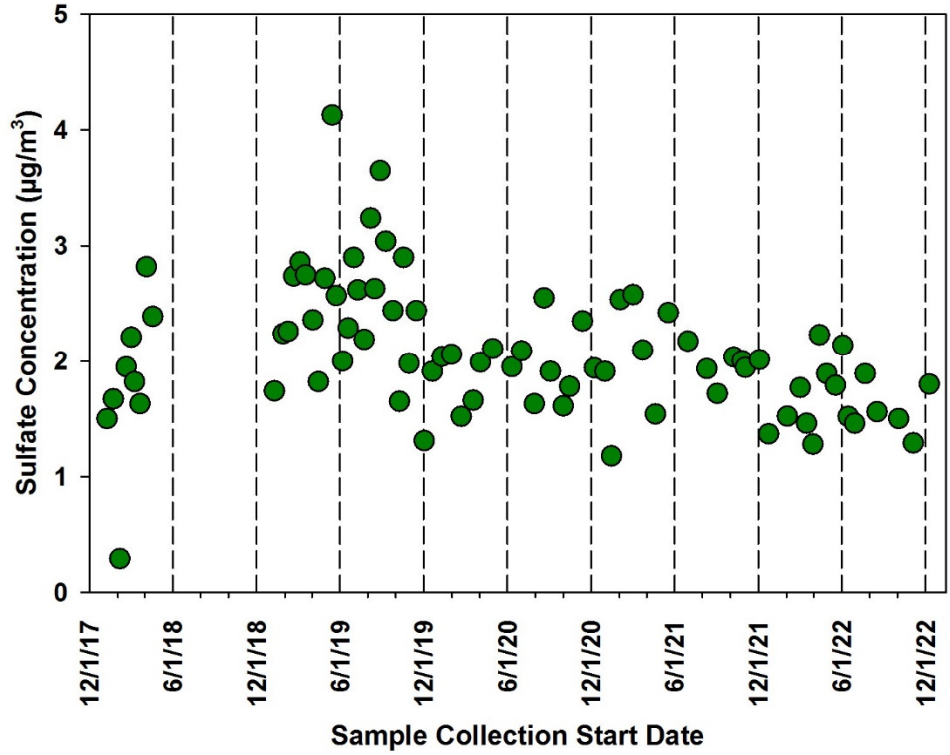
Whatman, Location 107, Chloride



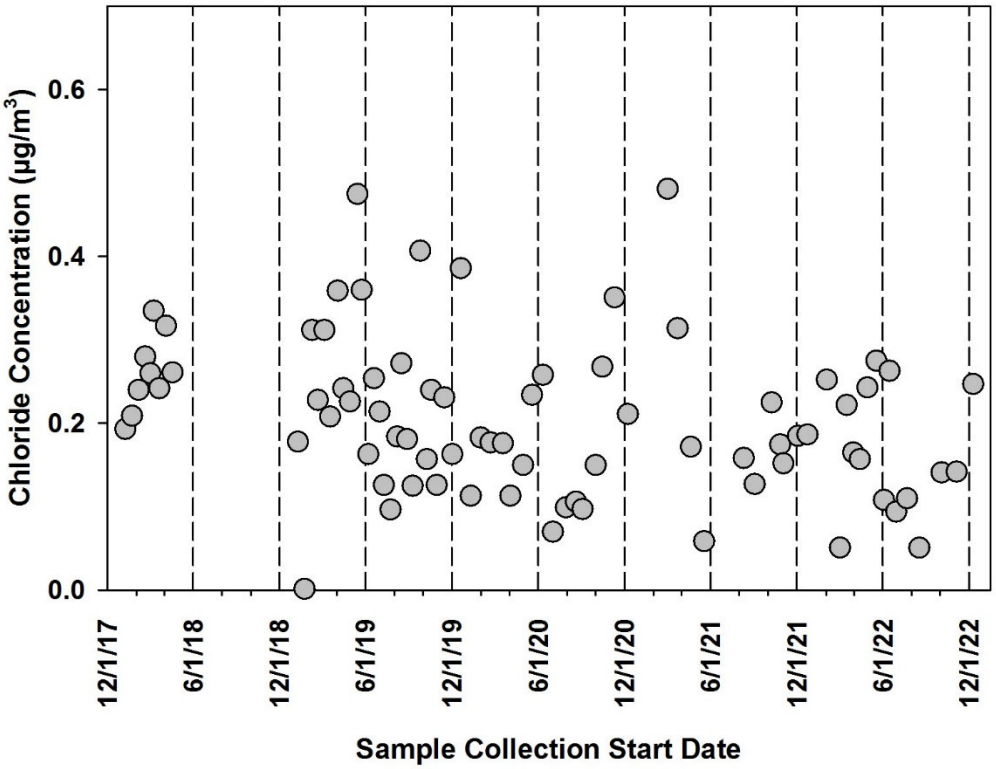
Whatman, Location 107, Nitrate



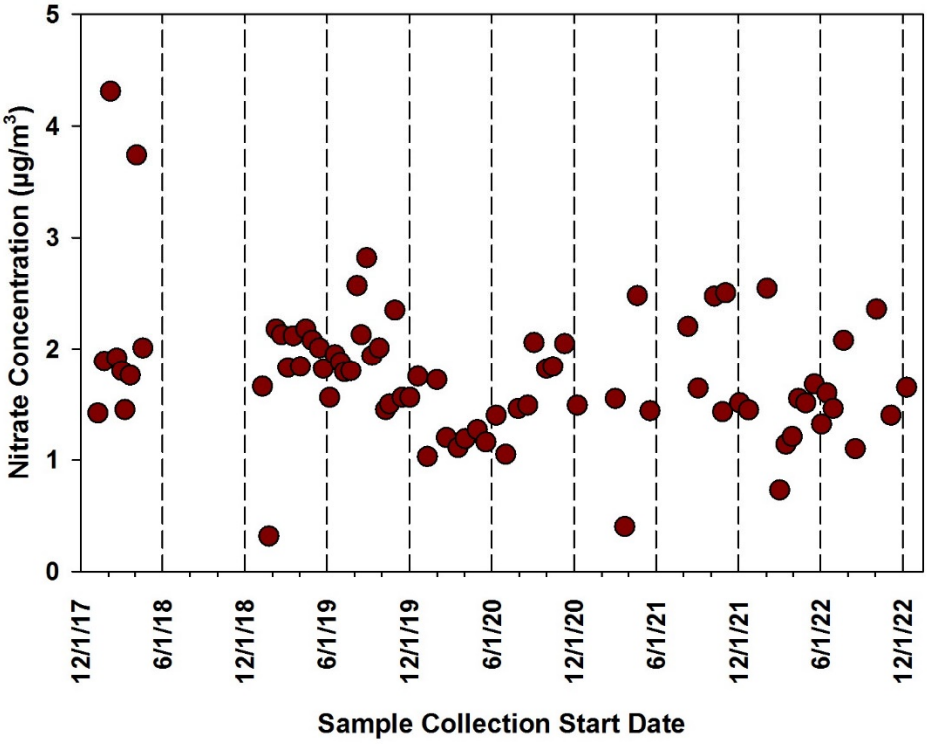
Whatman, Location 107, Phosphate



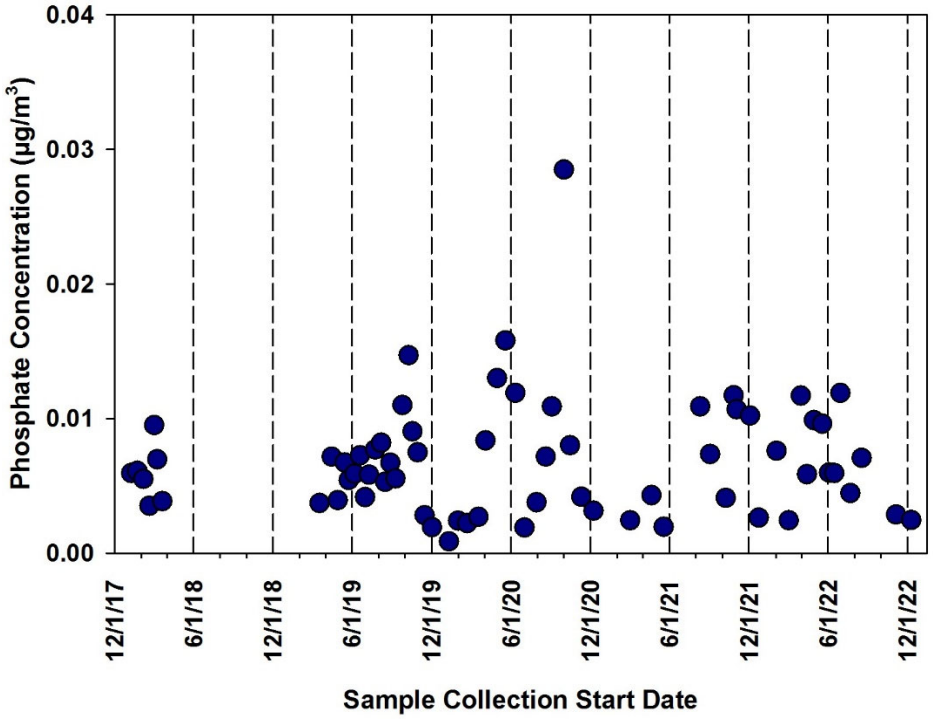
Whatman, Location 107, Sulfate



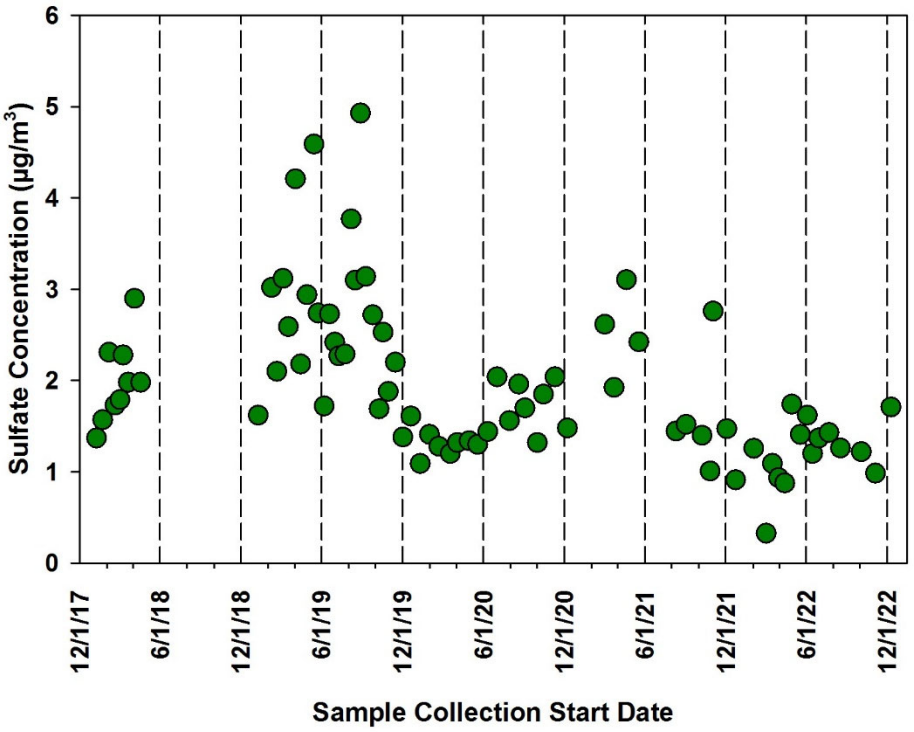
Whatman, Location 108, Chloride



Whatman, Location 108, Nitrate



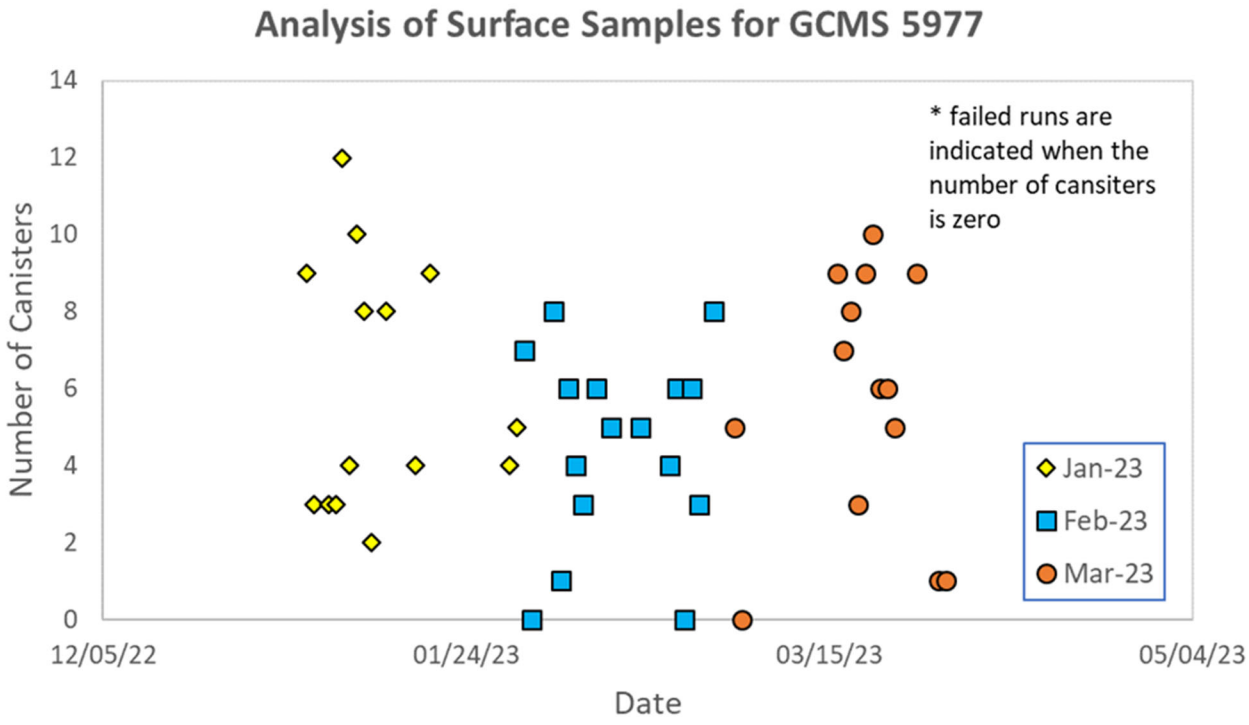
Whatman, Location 108, Phosphate



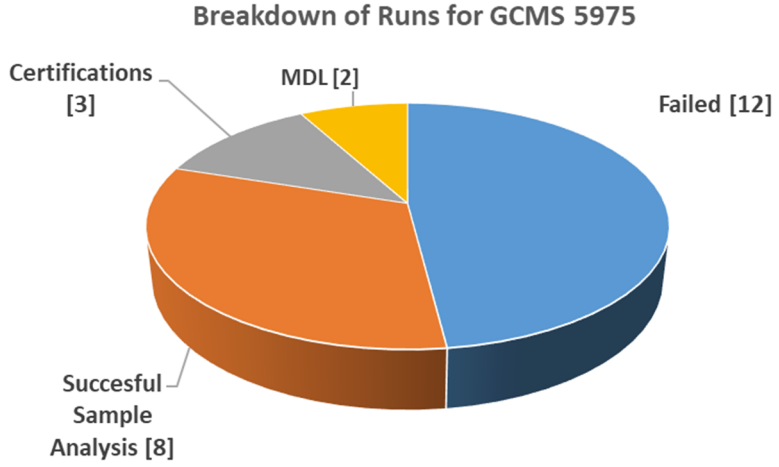
Whatman, Location 108, Sulfate

Organic Chemistry Group

The Organic Chemistry (OC) Group is monitoring the air quality at the surface and underground at the WIPP site with respect to volatile organic compounds (VOCs). There was personnel change during the first quarter of 2023 in the OC laboratory that temporarily disrupted the laboratory operations. However, operations have now returned to normal and productivity has been restored, as can be seen from the figure below, showing the number of analysis of surface samples.

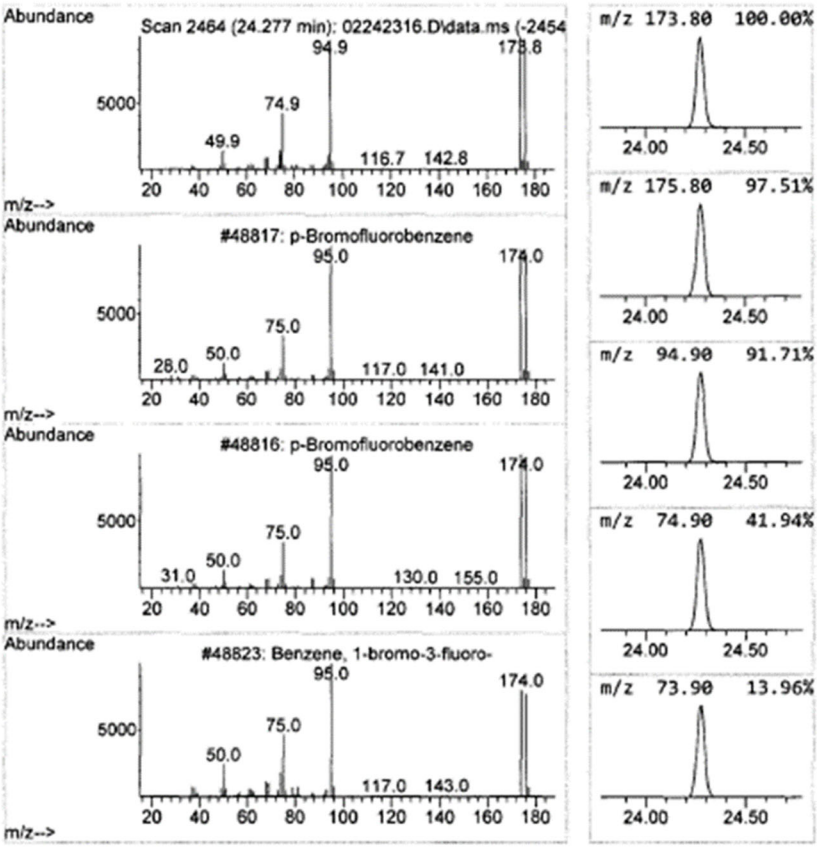


It should be noted that two of the instruments used for screening and for underground samples are quite old and this leads to many failed runs and loss of productivity, as can be seen in the figure below.



Representative analysis of the target trace compounds is shown below.

```
Data Path : J:\VOCs_Data_Packages\2023_GCMS_Data\5977\1st_Quarter\02242302\
Data File : 02242316.D
Acq On    : 25 Feb 2023  02:18
Operator  : WY
Sample    : 12222
Misc      : 300#12
ALS Vial  : 1   Sample Multiplier: 1

Quant Method : J:\VOCs_Data_Packages\2023_GCMS_Data\5977\Methods\01072301_ppbv_SCAN.M
Quant Title  : 5977, to15010723_SCAN_ppbv

TIC Library   : C:\Database\NIST20.L
TIC Integration Parameters: WVOC.P

******************************************************************************
Peak Number  6  p-Bromofluorobenzene            Concentration Rank  1

  R.T.     EstConc          Area       Relative to ISTD         R.T.
-----------------------------------------------------------------------
 24.277    2.51 ppbv       767194   Chlorobenzene-d5           22.574

 Hit# of  5    Tentative ID             MW  MolForm       CAS#       Qual
-----------------------------------------------------------------------
 1 p-Bromofluorobenzene                174 C6H4BrF       000460-00-4 94
 2 p-Bromofluorobenzene                174 C6H4BrF       000460-00-4 94
 3 Benzene, 1-bromo-3-fluoro-          174 C6H4BrF       001073-06-9 93
 4 Benzene, 1-bromo-3-fluoro-          174 C6H4BrF       001073-06-9 93
 5 Benzene, 1-bromo-2-fluoro-          174 C6H4BrF       001072-85-1 93
```

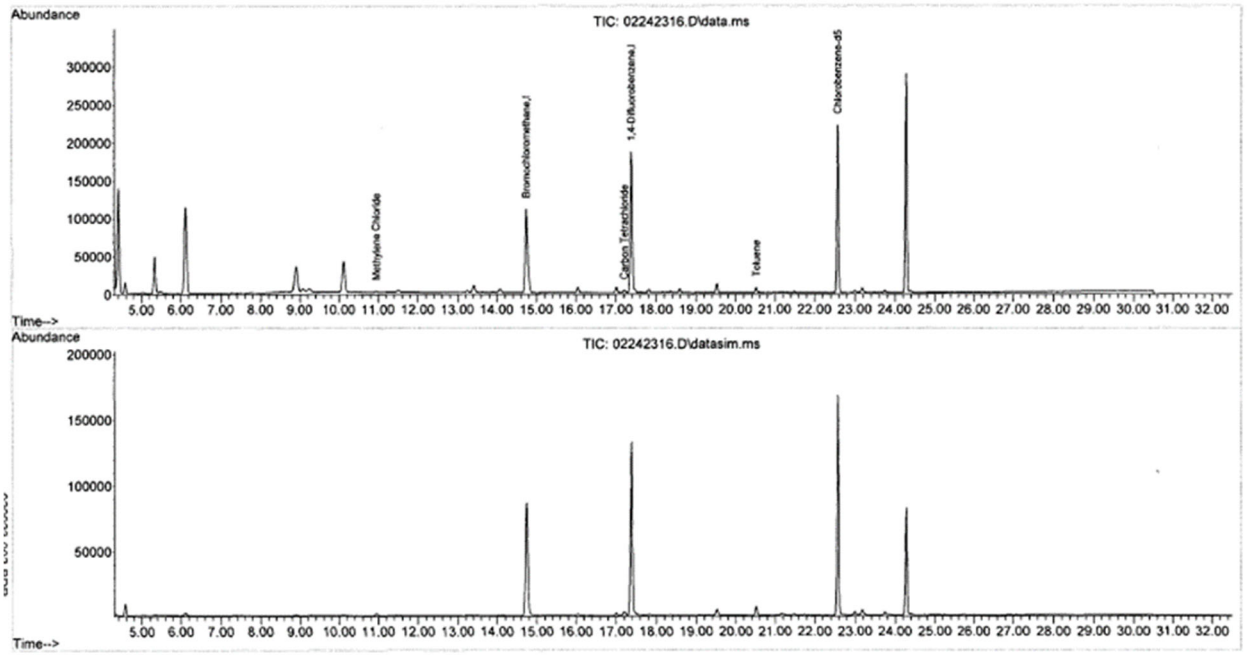


Similarly, characteristic spectra for surface samples are shown below.

Quantitation Report (QT/LSC Reviewed)

Data Path : J:\VOCs_Data_Packages\2023_GCMS_Data\5977\1st_Quarter\02242302\
Data File : 02242316.D
Acq On : 25 Feb 2023 02:18
Operator : WY
Sample : 12222
Misc : 300#12
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 01 09:38:11 2023
Quant Method : J:\VOCs_Data_Packages\2023_GCMS_Data\5977\Methods\01072301_ppbv_SCAN.M
Quant Title : 5977, to15010723_SCAN_ppbv
QLast Update : Tue Jan 10 15:46:22 2023
Response via : Initial Calibration



Internal Dosimetry Group

CEMRC Lung and Whole-Body APEX *In-Vivo* radiobioassay measurement system:
Performed successfully the annual energy and efficiency calibrations of CEMRC Lung and Whole-Body APEX *In-vivo* radiobioassay measurement system during January-March 2023.

Number of *in vivo* radiobioassay measurements performed during the reporting period: 17 for WIPP, 38 for the contract radiological personnel and those working in the laboratories located at CEMRC, 8 for the public participants.

Outreach activities:
The Internal Dosimetry (ID) group continues to interact with the general public and 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.

Specific activities during the reporting period:

1) 3/09/2023: A firefighter came for Lung and Whole-Body radiobioassay, very much interested in what ID laboratory is doing. He provided further information to contact the Carlsbad Fire department.
2) 3/15/2023: Carlsbad Municipal Transit employee wanted to know about CEMRC ID laboratory. Provided her an explanation and brief description of the Lung and Whole-Body radiobioassay measurement system, the meaning of the terms *in-vivo* and *in-vitro*, what is meant by base-line study and relevance with reference to WIPP, and about DOE's Lie Down and Be Counted program. She is interested in bringing her grandchildren (school students) for a tour of the laboratory.
3) 3/18/2023: The new ID laboratory employee provided a small video tour, through cell phone, of the Lung and Whole-Body radiobioassay measurement system to his enthusiastic ex-co-workers.