EAST SIDE COASTAL RESILIENCY

SANDRESM1 | PROJECT AREA 1

AIR QUALITY MONITORING REPORT

Q3 | 2023

ISSUE DATE: JANUARY 11, 2024
PERIOD COVERED: JULY-SEPTEMBER 2023
PREPARED BY: HNTB-LIRO JOINT VENTURE
WITH DATA COLLECTED BY: SA ENGINEERING, LLC.
SUBCONSULTANT TO IPC RESILIENCY PARTNERS

NYC DDC Department of Design and Construction

NEW YORK CITY DEPARTMENT OF DESIGN & CONSTRUCTION IN PARTNERSHIP WITH THE CITY OF NEW YORK

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PART 1

I. Air Quality Monitoring: Introduction

The East Side Coastal Resiliency (ESCR) project is a coastal protection initiative, jointly funded by the City of New York and the federal government, aimed at reducing flood risk due to coastal storms and sea level rise on Manhattan's East Side from East 25th Street to Montgomery Street. The ESCR project will protect 110,000 New Yorkers from the impacts of climate change by increasing resiliency for communities, properties, businesses, critical infrastructure, and public open spaces. In addition to providing flood protection, the project will strengthen and enhance waterfront spaces on Manhattan's East Side by improving accessibility, increasing ecological diversity, and delivering improved recreational amenities to a vibrant and highly diverse community.

The project is divided into three project areas: Project Area 1 (from Montgomery Street to East 15th Street, including East River Park), Project Area 2 (East 15th Street to East 25th Street, including Murphy Brothers Playground, Stuyvesant Cove Park, and Asser Levy Playground), and Parallel Conveyance (work to improve inland drainage on local streets between Montgomery Street and East 25th Street).

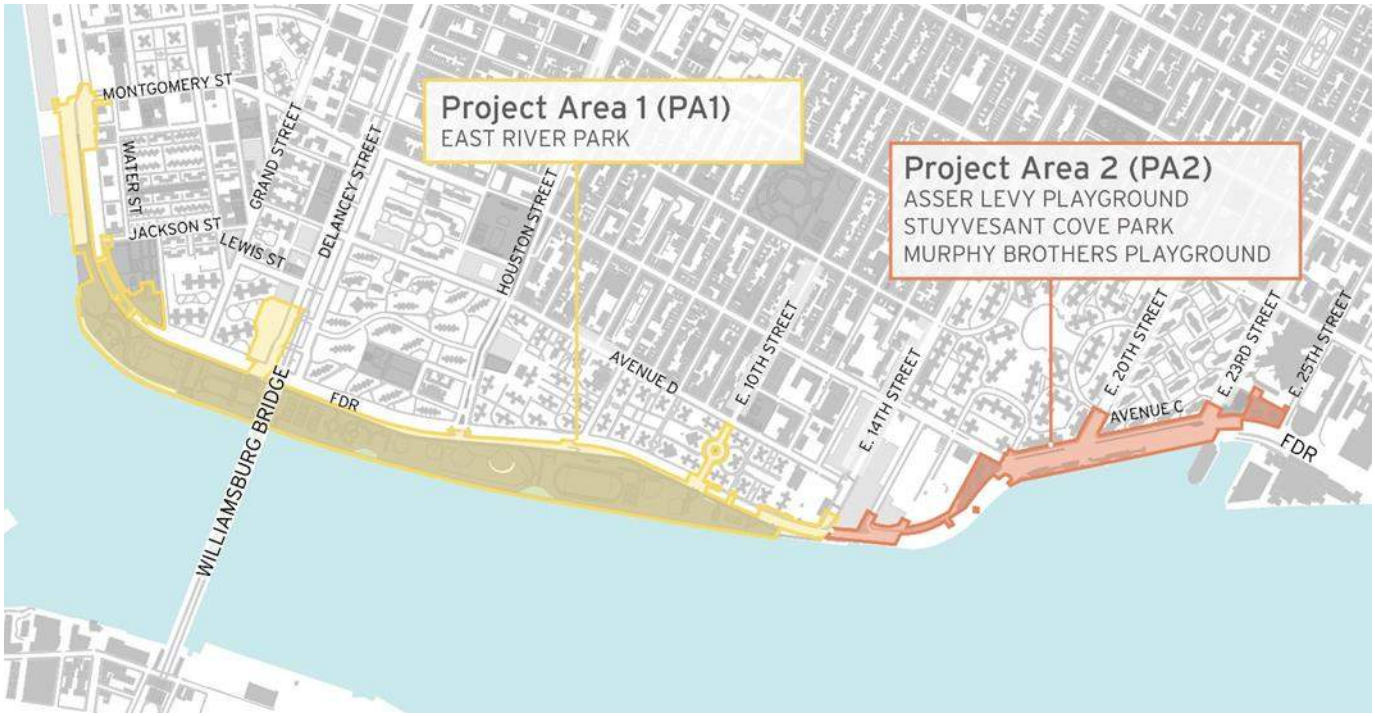


Fig.1 East Side Coastal Resiliency Project Areas

The ESCR team will be conducting air quality monitoring throughout construction in all three Project Areas to ensure the ongoing health and safety of the adjacent community. In particular, the ESCR Air Quality Monitoring program will measure levels of Particulate Matter (PM) at two sizes: PM10 and PM2.5.

As described by the Environmental Protection Agency (EPA):

> PM stands for **particulate matter** (also called particle pollution): the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope. Particle pollution includes:

- PM10: inhalable particles, with diameters that are generally 10 micrometers and smaller (typically from dust)
- PM2.5: fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller (typically from vehicle emissions)

The Clean Air Act requires EPA to set national air quality standards for particulate matter, as one of the six criteria pollutants considered harmful to public health and the environment. The law also requires the United States Environmental Protection Agency (EPA) to periodically review the standards to ensure that they provide adequate health and environmental protection, and to update those standards, as necessary. National Ambient Air Quality Standards (NAAQS) for PM pollution specify a maximum amount of PM to be present in outdoor air.

The **Permissible Exposure Limit (PEL)** is a regulatory limit to protect public health/welfare set by the NAAQS in line with the requirements of the Clean Air Act (CAA) on the amount or concentration of a substance in the air. The EPA has set a **24-hour time weighted average (TWA)** as standard for evaluating PM levels, meaning that they average potential PM exposure over a 24-hour period. This is also referred to as the **daily value**. In the line graphs presented in the ESCR monthly data plots, readings are averaged in 15-minute intervals and do not represent the standard TWA of 24-hrs. This more conservative approach will help the ESCR project team monitor the project's effect on air quality more closely.

The **Action Level (AL)** is lower than the PEL and represents a level set by the ESCR AQM Plan which, when reached, will alert the contractor that there has been an increase in particulate matter so that they can assess construction activities and take necessary measures to remediate the condition. Automated alerts are dispatched to the general contractor and the construction management team whenever the AL is exceeded.

The table here illustrates the PEL and AL for net PM2.5 and PM10 concentrations over a 24-hour TWA. These levels are measured in micrograms per cubic meter air ($\mu g/m^3$):

	Action Level (AL) over a 24-hour TWA	**Permissible Exposure Limit (PEL) over a 24-hour TWA**
PM2.5	25 $\mu g/m^3$	35 $\mu g/m^3$
PM10	100 $\mu g/m^3$	150 $\mu g/m^3$

The ESCR Final Environmental Impact Statement (FEIS) analyzed the potential impact of the construction on community air quality and determined that **with consistent air quality monitoring and application of measures to reduce pollutant emissions and suppress dust, "construction of the Preferred Alternative would not result in any predicted concentrations above the National Ambient Air Quality Standards (NAAQS)** for NO2, CO, and PM10 or the de minimis thresholds for PM2.5 from nonroad and on-road sources. **Therefore, *no significant adverse air quality impacts are predicted* from the construction of the Preferred Alternative."** (ESCR FEIS, Chapter 6.10 Construction Air-Quality, 6.10-2)

Along with air quality monitoring, the contractor is required to take extensive preventative measures to control dust and limit vehicle emissions. Potential mitigation techniques include but are not limited to:

- use of water spray for roads, trucks, excavation areas and stockpiles
- use of anchored tarps to cover stockpiles
- use of truck covers during soil transport within site limits and during off-site transport

- employment of extra care during dry and/or high-wind periods
- use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface
- use of a truck wheel wash at site access/egress points to prevent fugitive dust and off-site migration of dust and other particulates

How to Read the Data Plots

The PM readings that follow by month in this report are shown in data plots, as below. The data plots illustrate **PM** levels in a **15-minute TWA.** As mentioned above, the federal limits for PM exposure are evaluated on a **24-hour TWA**. By evaluating PM readings on the 15-minute TWA, the ESCR project can ensure that Net PM never exceeds the 24-hour TWA, or daily value.

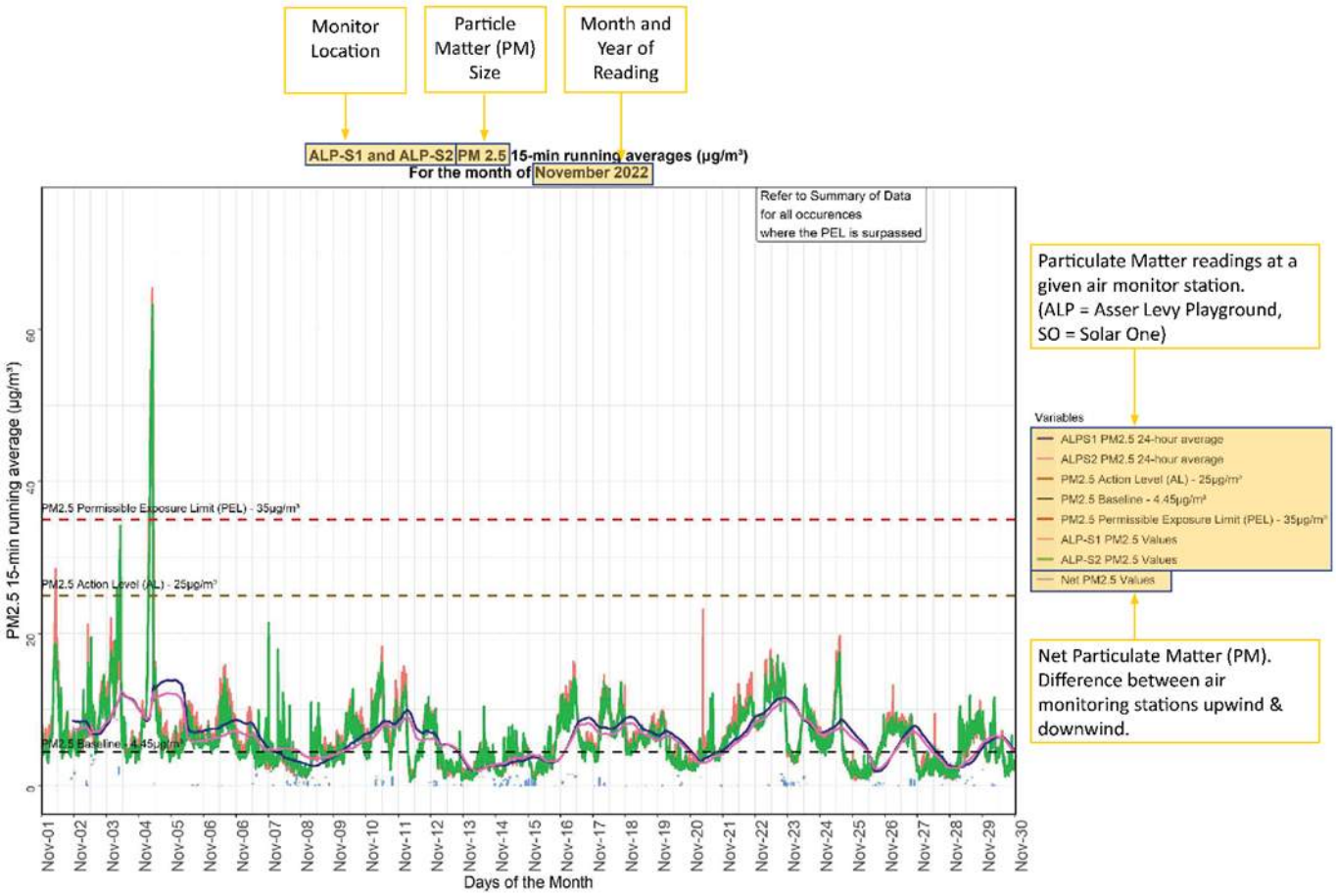


Fig.2 Sample Air Quality Data Plot

The **Net particulate matter (Net PM)** readings are determined as the difference between the upwind and downwind monitoring stations as determined on any day given the wind speed and wind direction. At each construction location at least two air quality monitors are required to determine the Net PM. The Net PM value is important because it measures the **potential increase of particulate matter due to construction activities**. If the wind-speed is less than 0.5 meters per second, the downwind station is considered undetermined, and the Net PM will be absent from the data plot. In these circumstances, high readings at one or both monitoring stations will still be noted, however the increased levels in the PM readings may be due to conditions unrelated to construction.

An **exceedance** is a daily value that is above the level of the 24-hour TWA after rounding to the nearest 10 $\mu g/m^3$ (i.e., values ending in 5 or greater are to be rounded up).

An **exceptional event** is an uncontrollable event caused by natural sources of particulate matter or an event that is not expected to recur at a given location. Inclusion of such a value in the computation of exceedances or averages could result in inappropriate estimates of their respective expected annual values.

An **outlier** is a data point on a graph or in a set of results that is very much bigger or smaller than the next nearest data point. For example, outliers among monitoring data can be due to instrument malfunctions, the influence of harsh environments, and the limitation of measuring methods.

II. Executive Summary

This report summarizes the PM readings for ESCR Project Area 1 (PA1), collected by SA Engineering, environmental subconsultant to the PA1 contractor, IPC Resiliency Partners (IPC) April through June 2023. The PA1 contract requires a minimum of six (6) air quality monitoring stations throughout construction, which are relocated as necessary to reflect the phased construction activities. Currently sixteen (16) air quality monitoring stations are active throughout the construction area perimeter and reflect current construction areas. For this report, each monitor will be referred to as "AQM-#" – referring to the numbers in Figures 3A and 3B. Figure 3A details the locations of the air quality monitoring stations prior to March 24, 2023.

Fig.3A ESCR Project Area 1 Phase 1 Air Quality Monitoring Station Locations, as of January 13, 2023

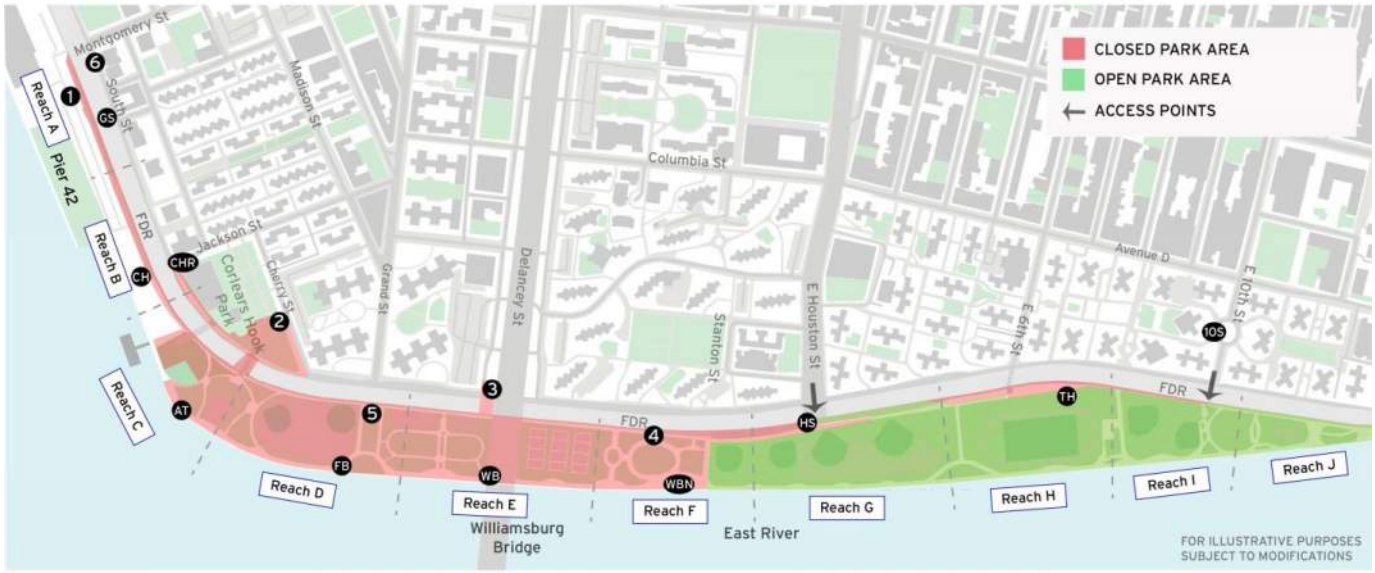


Fig.3B ESCR Project Area 1 Phase 1 Air Quality Monitoring Station Locations, as of March 24, 2023

Due to construction activities, by March 24, 2023, the AQM-CH and AQM-CHR monitors were installed in Reach B at the location shown below; the monitor began recording upon installation. Figure 3B details the updated locations of the air quality monitoring stations.

Work Activities from July to September 2023:

Reach A*:

- Demobilize Montgomery St. laydown area (Saturday, 8/5)
- Carbon Fiber Wrapping /backfill
- Excavate pavement, grade, and pave new on-ramp to FDR Drive (3:00 PM – 12:00 AM, Monday to Friday 8/28 to 9/1 and 9/7 to 9/8)
- Move traffic entering FDR onto temporary on-ramp (9/23 3:00 PM to 5:30 AM)
- Demo hardscape at Montgomery St. (Saturday 9/23 and Monday to Friday 9/25 to 9/29)

Reach B:

- Excavation for emergency Con Edison Work (Continuous from 7/7 to 7/9)
- Carbon Fiber Wrapping and backfill
- Excavate pavement, grade, and pave new on-ramp to FDR Drive (3:30 PM to 12:00 AM; 9/7 to 9/8 | 7:00 AM to 3:30 PM; 9/18 to 9/22)

Reach C:

- Install Pre-cast Box Sewer, RCP Interceptor, pull sheets
- Drill & drive floodwall piles & sheeting
- Backfill archaeological dig at Corlears Hook Park
- Form and pour Corlears Hook Park wingwalls
- Electrical work at Grand St. ferry (10:00 PM to 6:00 AM; 9/12 to 9/15)

Reach D (3:30 PM – 12:00 AM 6/5 to 6/23; Monday to Friday):

- Drill & drive floodwall piles & sheeting
- Bulkhead Demolition & Timber Pile Extraction
- Marine Support Services and place fill.
- Install tie rods between floodwall and cutoff wall
- Sewer work: cofferdams and outfalls

Reach E:

- Place fill
- Drill & drive floodwall piles & sheeting
- Install tie rods and walers for floodwall
- Form, pour and backfill Delancey St. East abutment
- Drive H-piles at Delancey West

Reach F:

- Pipe Pile Installation for Combi-Wall
- Test piles for Houston St. micropipes (8/14 to 8/22)
- Form and pour Piers 72 – 76

Reach G:

- Mobilize to Houston St. for micropile installation (7:00 AM to 3:30 PM; Wednesday 9/27)

East 10th Street:

- Utility / sewer work
- Electrical Vault Demolition & duct bank Layout

*: Offsite construction activities performed by New York City Economic Development Corporation (NYCEDC) for Pier 42 project throughout the quarter impacted onsite air quality readings

Though air quality is monitored 24/7, typical day time work hours during the period of this report are 7:00 am – 3:30 pm, unless otherwise noted above.

Summary of Air Quality Monitoring Reports

For the months of July to September 2023, construction-related levels of PM at both net PM2.5 and PM10 levels did not surpass Daily PEL as set by federal standards for the 24-hour TWA, or daily value, and did not cause air quality concerns to the public or on-site workers. The contractor, IPC, in conjunction with the contractor's environmental specialist, has successfully implemented mitigation techniques at both AL as well as PEL (15-minute TWA) to suppress construction activity effects on air quality in East River Park. Air quality impacts including 24-hour TWA exceedance from Canadian wildfires, July 4th Fireworks, and other citywide air quality events were observed during multiple days in July 2023.

July 2023*:

- PM2.5 levels surpassed the PEL (15-minute TWA) at AQM-1 on July 17, July 20, and July 28; AQM-CHR on July 7, July 8, July 11, July 13, July 15, July 18, July 19, July 20, July 24, July 26, July 28, and July 31; AQM-AT on July 20; AQM-5 on July 8; AQM-2 on July 24; AQM-4 on July 11, July 12, July 14, July 17, July 27, and July 31; and AQM-HS on July 12, July 13, and July 19.

- PM10 levels surpassed the PEL (15-minute TWA) at AQM-1 on July 20, and July 31; AQM-CHR on July 7, July 8, July 11, July 13, July 15, July 18, July 20, July 21, July 22, July 24, July 26, July 28, and July 31; AQM-5 on July 8; AQM-AT on July 20; AQM-2 on July 24; and AQM-4 on July 31.

August 2023:

- PM2.5 levels surpassed the PEL (15-minute TWA) at AQM-1 on August 2, August 4, August 7, August 17, August 24, August 28, August 30, and August 31; AQM-CHR on August 4, August 5, August 10, August 24, August 28, and August 29; AQM-4 on August 2, August 14, and August 22; and AQM-AT on August 2.

- PM10 levels surpassed the PEL (15-minute TWA) at AQM-1 on August 7, August 17, August 24, August 28, August 31; AQM-CHR on August 10, August 14, August 24, August 28, and August 29; AQM-AT on August 2, AQM-3 on August 18 and August 30; and AQM-10S on August 2.

September 2023:

- PM2.5 levels surpassed the PEL (15-minute TWA) at AQM-1 on September 7, September 20, September 21, September 22, September 23, September 27, and September 28; AQM-CHR on September 5, September 6, September 7, September 8, September 16, and September 30; AQM-FB on September 7; AQM-2 on September 8; AQM-4 on September 14 and September 15; and AQM-HS on September 3, September 16, and September 27.

- PM10 levels surpassed the PEL (15-minute TWA) at AQM-1 on September 7, September 15, September 23, and September 27 AQM-CHR on September 5, September 7, September 8, September 16, and September 29; AQM-2 on September 7; AQM-3 on September 15; AQM-4 on September 14; and AQM-HS on September 3 and September 14.

*: Particulates from the Canadian wildfires, July 4th fireworks, and other air quality events impacted air quality city and state-wide and are discussed in the summary of the data for June 2023.

Baselines:

- PM10 baseline air quality at the site were previous determined to be between 0.149 and 5.00 $\mu g/m^3$
- PM2.5 baseline air quality at the site were previous determined to be between 0.105 and 4.09 $\mu g/m^3$

PART 2

Summary of Data July 2023

PM2.5 levels surpassed the PEL (15-minute TWA) at the following locations:

- AQM-1 on 7/17 for 40 minutes, 7/20 for 16 minutes, and 7/28 for 15 minutes;
- AQM-CHR on 7/7 got 21 minutes, 7/8 for 15 minutes, 7/11 for 23 and 71 minutes, 7/13 for 49 minutes, 7/15 for 29 minutes, 7/18 for 74 and 17 minutes, 7/19 for 790 minutes, 7/20 for 395 minutes and 25 minutes, 7/24 for 101 minutes, 7/26 for 26 minutes, 7/28 for 27 minutes, and 7/31 for 48 minutes;
- AQM-AT on 7/20 for 17 minutes;
- AQM-5 on 7/8 for 30 minutes;
- AQM-2 on 7/24 for 16 minutes;
- AQM-4 on 7/11 for 36 minutes, 7/12 for 15 minutes, 7/14 for 16 minutes, 7/17 for 14 minutes, 7/27 for 16 minutes, and 7/31 for 80 minutes;
- AQM-HS on 7/12 for 15 and 12 minutes, 7/13 for 17 minutes, and 7/19 for 15 minutes; and
- All locations on 7/1, 7/5, and 7/19 to 7/20 city and state-wide Canadian wildfire, July 4th fireworks, and other air quality event impacts.

PM10 levels surpassed the PEL (15-minute TWA) at the following locations:

- AQM-1 on 7/31 for 15 minutes;
- AQM-CHR on 7/7 for 25 and 22 minutes, 7/8 for 22 minutes, 7/11 for 71 and 15 minutes, 7/13 for 50 minutes, 7/15 for 30 minutes, 7/18 for 71 minutes, 7/20 for 25 minutes, 7/21 for 29 minutes, 7/24 for 77 minutes, 7/26 for 26 minutes, 7/28 for 17 and 27 minutes, and 7/31 for 48 minutes;
- AQM-5 on 7/8 for 24 minutes, 7/20 for 15 minutes, and 7/24 for 16 minutes; and
- AQM-4 on 7/31 for 32 minutes.

For the month of July 2023, PM net 2.5 levels were surpassed on 7/7, 7/8, 7/11, 7/12, 7/13, 7/14, 7/15, 7/17, 7/18, 7/19, 7/20, 7/24, 7/26, 7/27, 7/28, and 7/31. PM net 10 were exceeded on 7/7, 7/8, 7/11, 7/13, 7/15, 7/18, 7/20, 7/21, 7/22, 7/24, 7/26, 7/28, and 7/31.

For the month of July 2023, construction-related PM net 2.5 or 10 levels did not surpass the Daily PEL (24-hour TWA).

PM 2.5 µg/m^3

- PM 2.5 µg/m^3 levels surpassed the PEL (15-minute TWA) on 31 occasions (7/7, 7/8, 7/11, 7/12, 7/13, 7/14, 7/15, 7/17, 7/18, 7/19, 7/20, 7/24, 7/26, 7/27, 7/28, and 7/31) for between 2 and 790 minutes.
    - AQM-1 is located near the site access gate at Gouverneur Slip West and adjacent to another construction site and an FDR entry ramp; the elevated readings on 7/17, 7/20, and 7/28 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
    - AQM-CHR is located on the construction access road/shared use path in Reach B.
        - Elevated readings on 7/13 and 7/18 were related to offsite construction activity under a different contract. A water truck was deployed to mitigate airborne dust.
        - Elevated readings on 7/7, 7/11, 7/20, 7/24, 7/26, 7/28, and 7/31 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
        - Elevated readings on 7/8 and 7/19 were wee related to onsite construction activity. A water truck was deployed to mitigate airborne dust.

        - Elevated readings on 7/11 and 7/15 were related to offsite activity. A water truck was deployed to mitigate airborne dust.
    - AQM-5 is located south of the Williamsburg Bridge near the construction trailers onsite; the elevated readings on 7/8 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
    - AQM-AT is located near the former amphitheater and Corlears Hook pedestrian bridge; the elevated readings on 7/20 were related offsite activity.
    - AQM-2 is located in Corlears Hook Park adjacent to Cherry Street; the elevated readings on 7/24 were related to construction activity.
    - AQM-4 is located adjacent to the shared use path/construction access road.
        - Elevated readings on 7/27 were related to offsite activity.
        - Elevated readings on 7/11, 7/12, 7/14, 7/17, and 7/31 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
    - AQM-HS is located near the Houston Street ramp at the exit to the construction on the FDR; the elevated readings on 7/12, 7/13, and 7/19 related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.

PM 10 µg/m^3

- PM 10 µg/m^3 levels surpassed the PEL (15-minute TWA) 21 occasions 7/7, 7/8, 7/11, 7/13, 7/15, 7/18, 7/20, 7/21, 7/22, 7/24, 7/26, 7/28, and 7/31) for between 14 and 77 minutes.
        - AQM-1 is located near the site access gate at Gouverneur Slip West and adjacent to another construction site and an FDR entry ramp; the elevated readings were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
    - AQM-CHR is located on the construction access road/shared use path in Reach B.
        - Elevated readings on 7/7, 7/8, 7/11, 7/18, 7/20, 7/21, 7/22, 7/24, 7/26, 7/28, and 7/31 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
        - Elevated readings on 7/11 and 7/15 were related to offsite activity.
        - Elevated readings on 7/13 were related to the third-party offsite construction activities. A water truck was deployed to mitigate airborne dust.
    - AQM-5 is located south of the Williamsburg Bridge near the construction trailers onsite.
        - Elevated readings on 7/8 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
        - Elevated readings on 7/20 were related to offsite activity.
        - Elevated readings on 7/24 were related to onsite construction activity. A water truck was deployed to mitigate airborne dust.
    - AQM-4 is located adjacent to the shared use path/construction access road; the elevated readings on 7/31 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.

Mitigation Measures

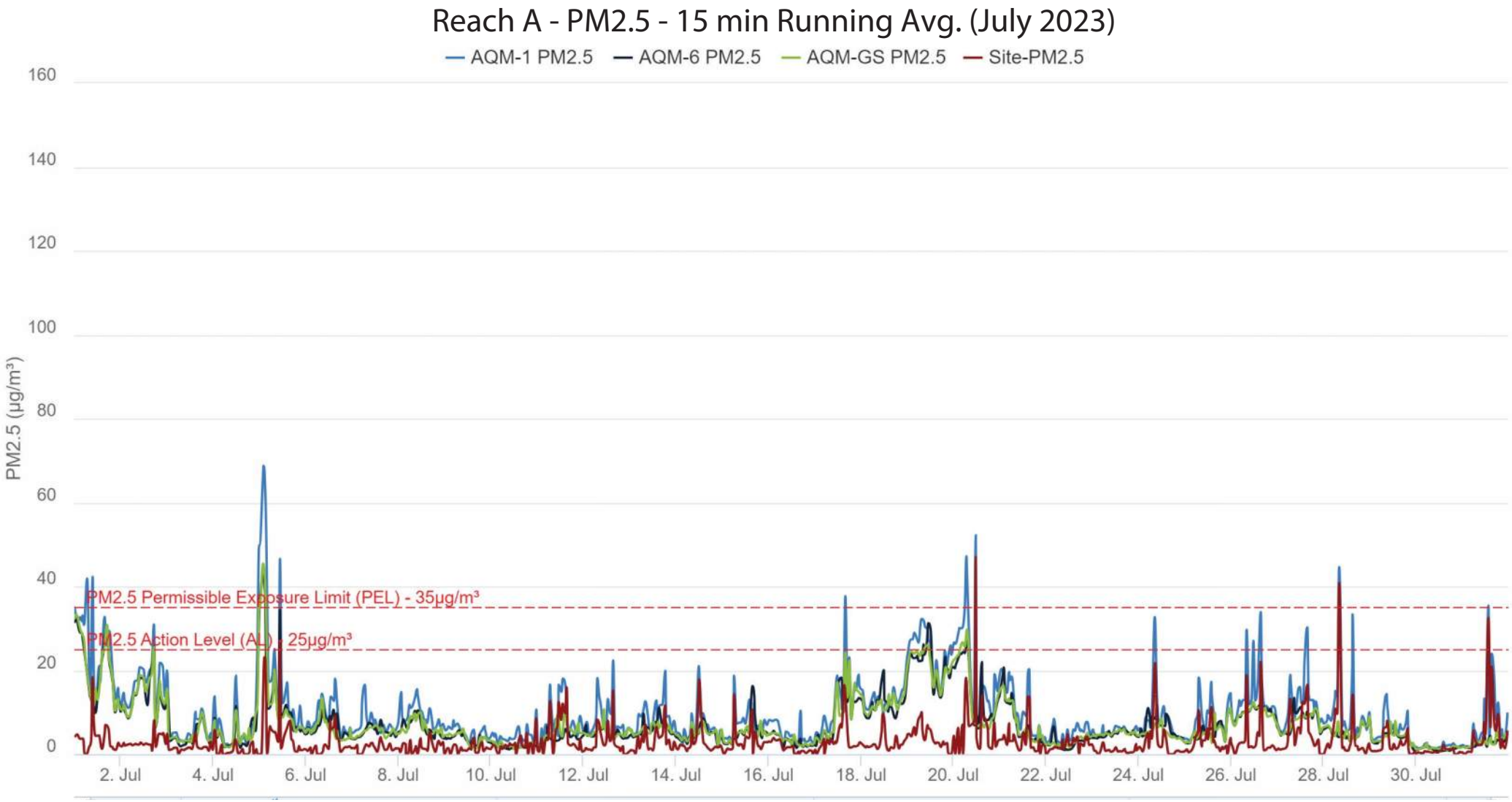
- Throughout the month, construction activity was closely monitored, and dust mitigation techniques were continuously implemented to successfully contain any airborne particulates created due to construction activity.

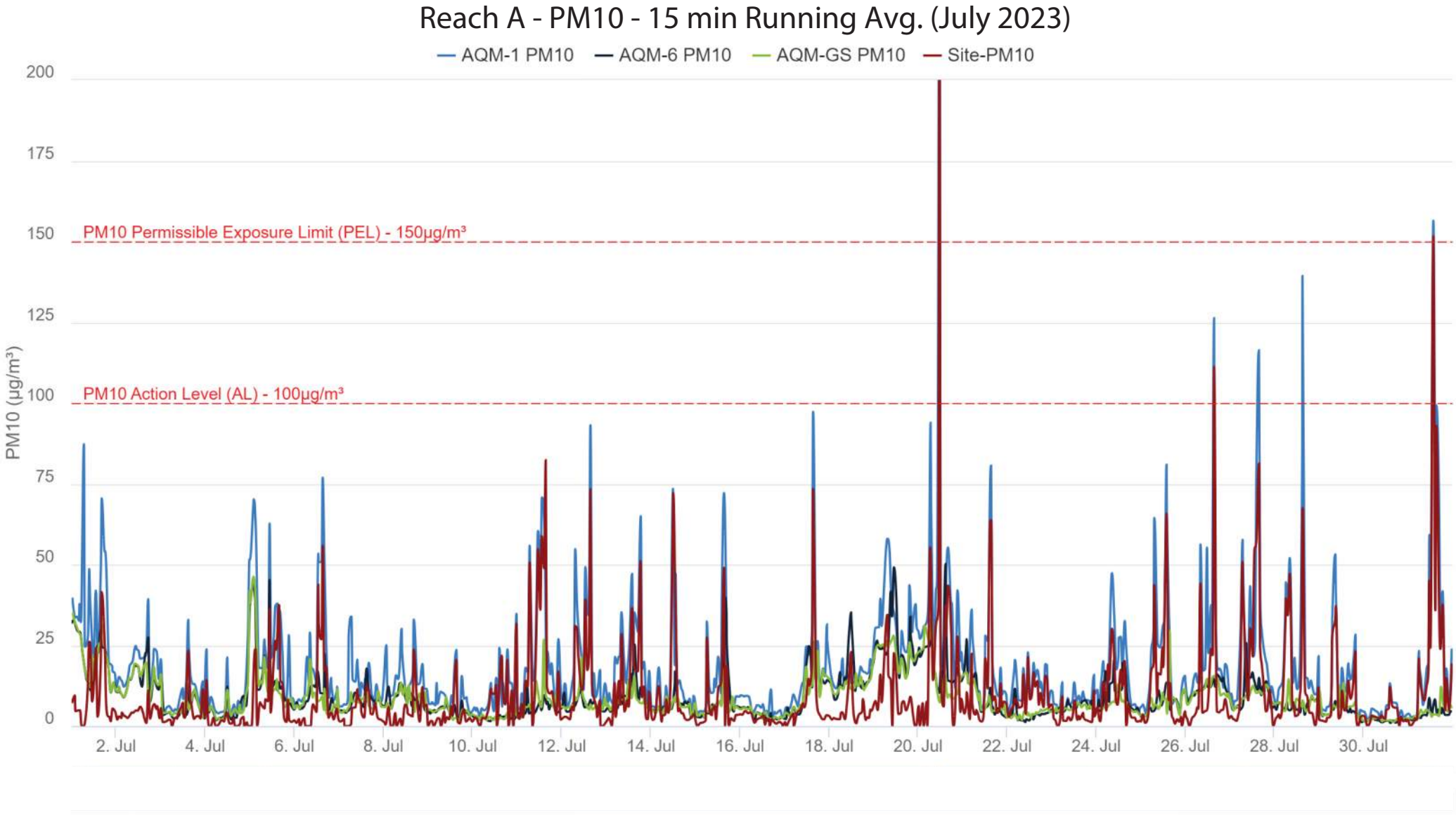
Canadian Wildfire, July 4th Fireworks, and Other Air Quality Event Impacts

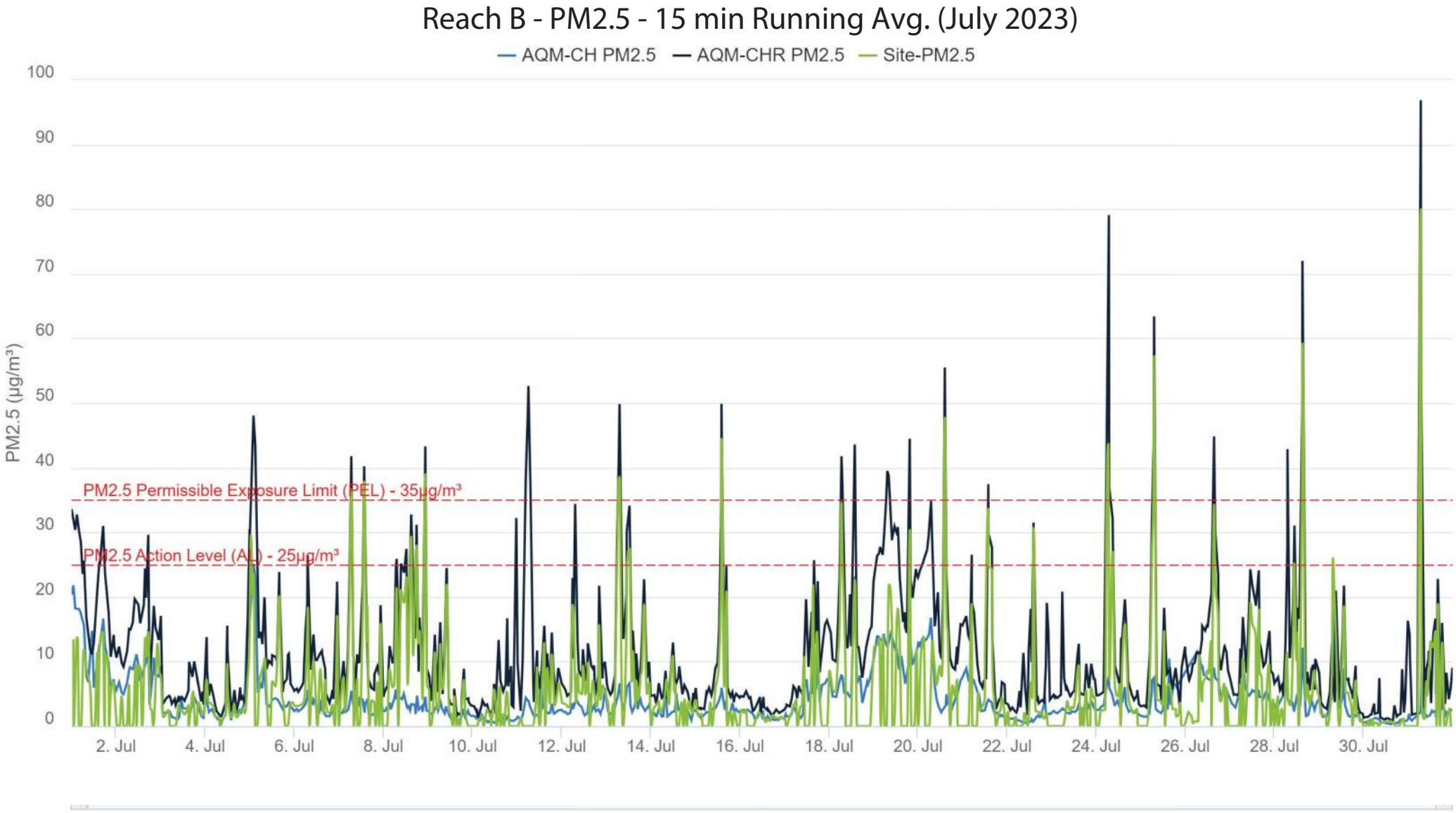
- On July 1st, particulates from wildfires burning in the northern Canadian provinces impacted air quality city and state-wide. On July 5th, impacts from the citywide fireworks celebration for July 4th impacted air

quality at the site. An additional air quality event with an unknown origin impacted the site on July 19th and 20th. Impacts of these events were observed at the air quality monitors present throughout the SANDRESM1 project site causing the 24-hour TWA to exceed the allowable project limits. The Canadian wildfire, July 4th fireworks, and other air quality event impacts were noted in the July 2023 Air Quality Monitoring Report submitted by the contractor and presented to the Community Action Group (CAG).

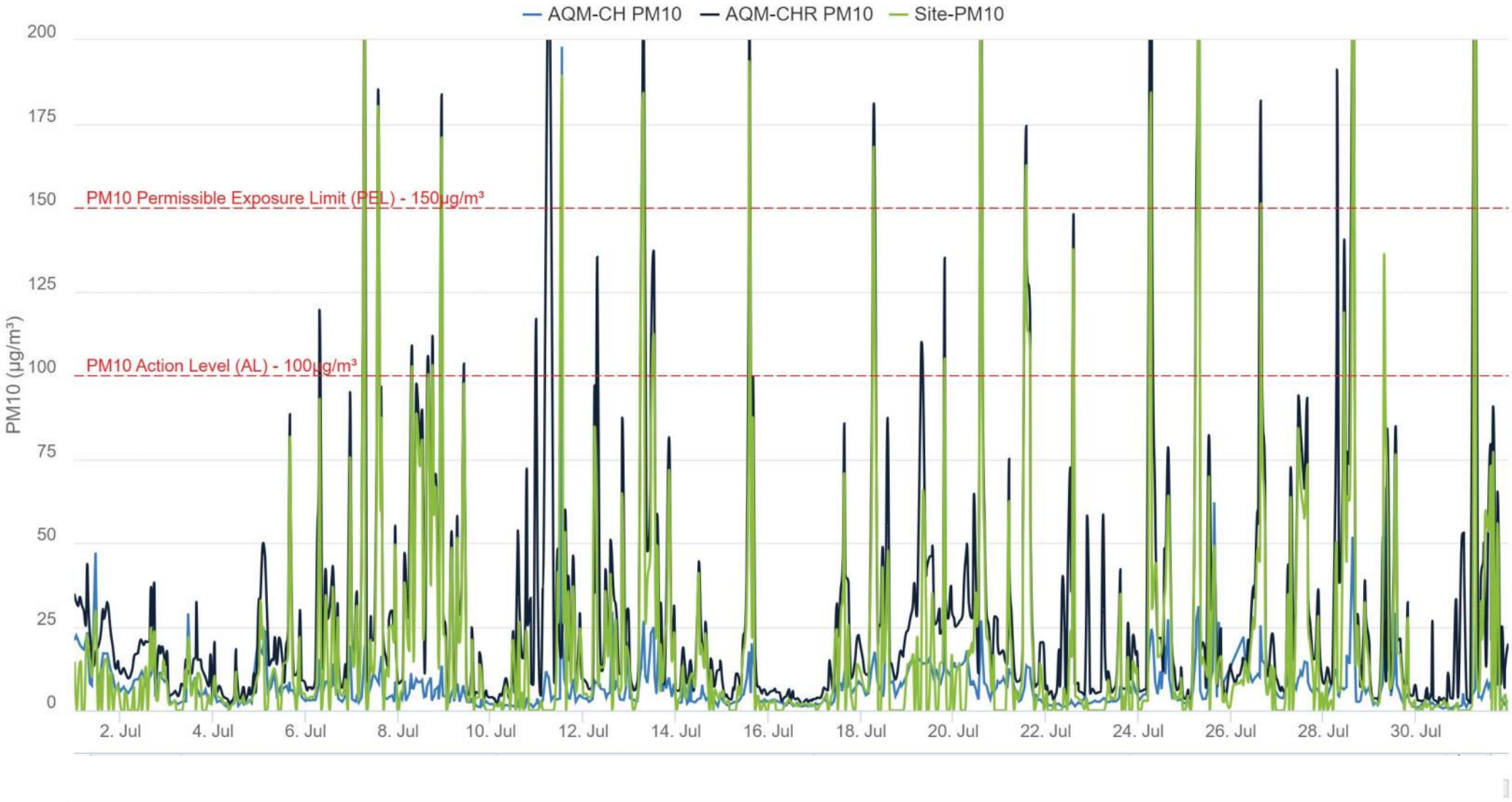
JULY 2023 DATA PLOTS


Reach A - PM2.5 - 15 min Running Avg. (July 2023)
AQM-1 PM2.5
AQM-6 PM2.5
AQM-GS PM2.5
Site-PM2.5
PM2.5 (µg/m³)
160
140
120
100
80
60
40
20
0
PM2.5 Permissible Exposure Limit (PEL) - 35µg/m³
PM2.5 Action Level (AL) - 25µg/m³
2. Jul
4. Jul
6. Jul
8. Jul
10. Jul
12. Jul
14. Jul
16. Jul
18. Jul
20. Jul
22. Jul
24. Jul
26. Jul
28. Jul
30. Jul

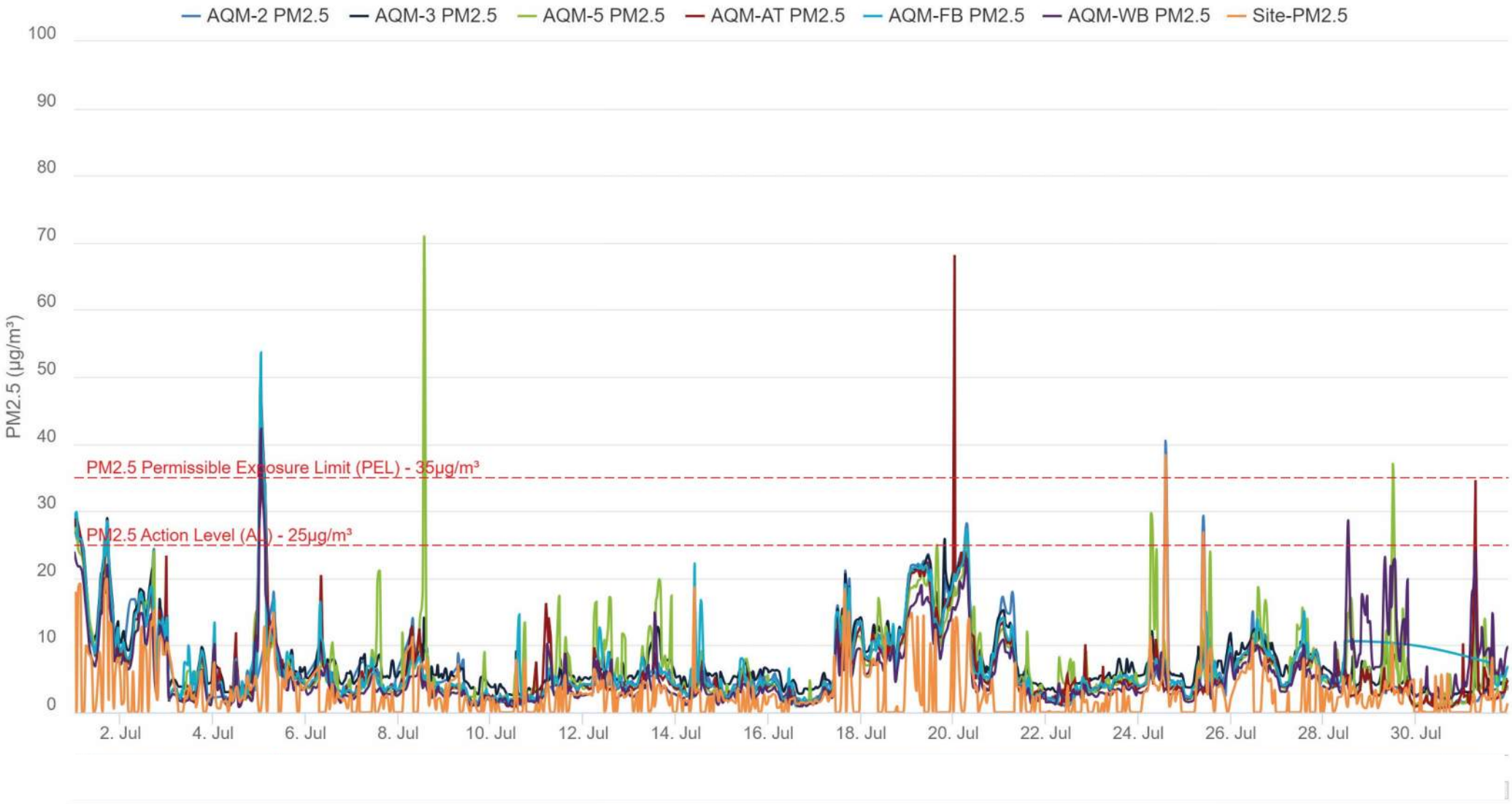

Reach A - PM10 - 15 min Running Avg. (July 2023)
AQM-1 PM10
AQM-6 PM10
AQM-GS PM10
Site-PM10
PM10 Permissible Exposure Limit (PEL) - 150µg/m³
PM10 Action Level (AL) - 100µg/m³
PM10 (µg/m³)
200
175
150
125
100
75
50
25
0
2. Jul
4. Jul
6. Jul
8. Jul
10. Jul
12. Jul
14. Jul
16. Jul
18. Jul
20. Jul
22. Jul
24. Jul
26. Jul
28. Jul
30. Jul


Reach B - PM2.5 - 15 min Running Avg. (July 2023)
AQM-CH PM2.5
AQM-CHR PM2.5
Site-PM2.5
PM2.5 (µg/m³)
100
90
80
70
60
50
40
30
20
10
0
PM2.5 Permissible Exposure Limit (PEL) - 35µg/m³
PM2.5 Action Level (AL) - 25µg/m³
2. Jul
4. Jul
6. Jul
8. Jul
10. Jul
12. Jul
14. Jul
16. Jul
18. Jul
20. Jul
22. Jul
24. Jul
26. Jul
28. Jul
30. Jul

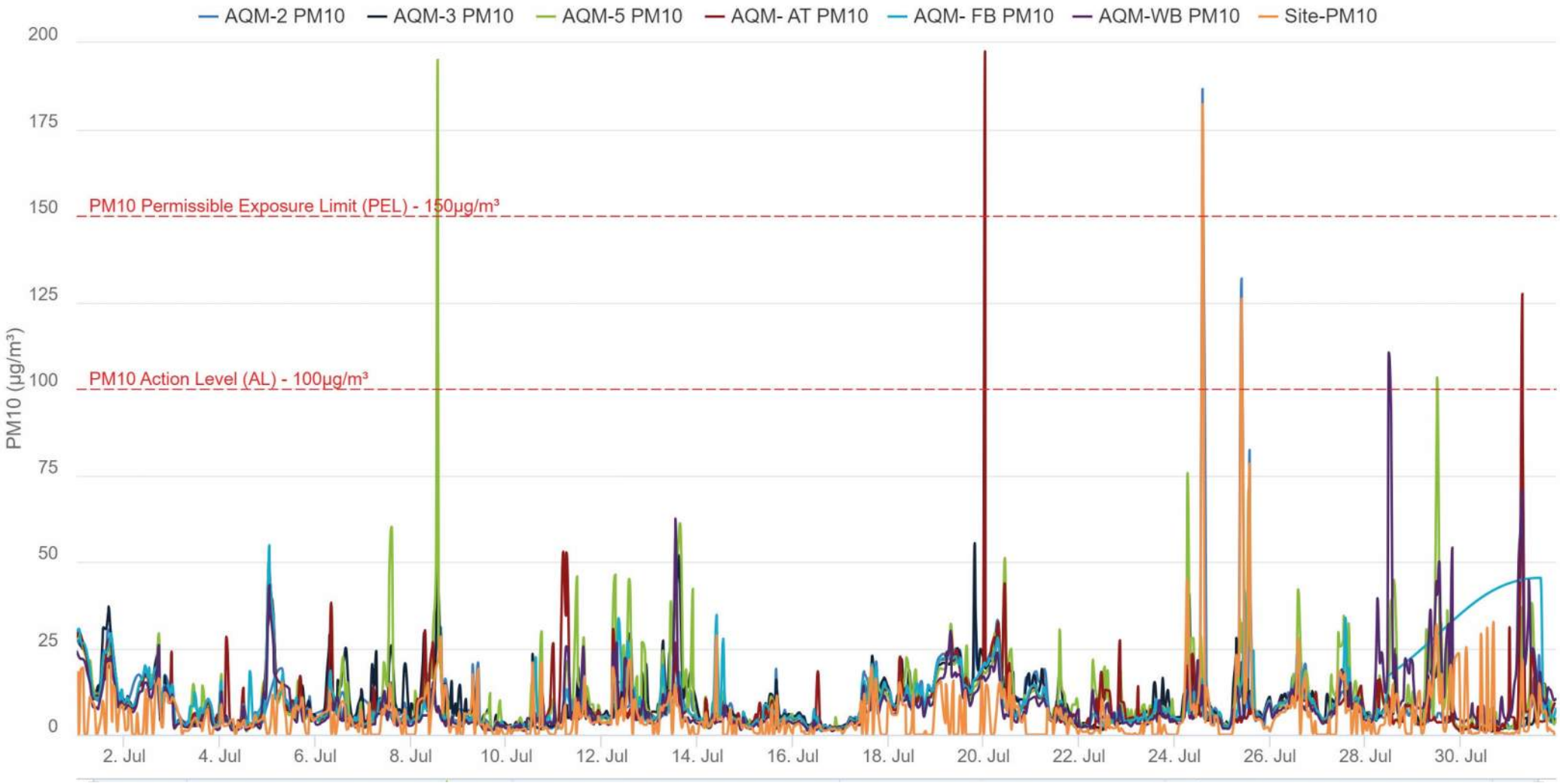
Reach B - PM10 - 15 min Running Avg. (July 2023)



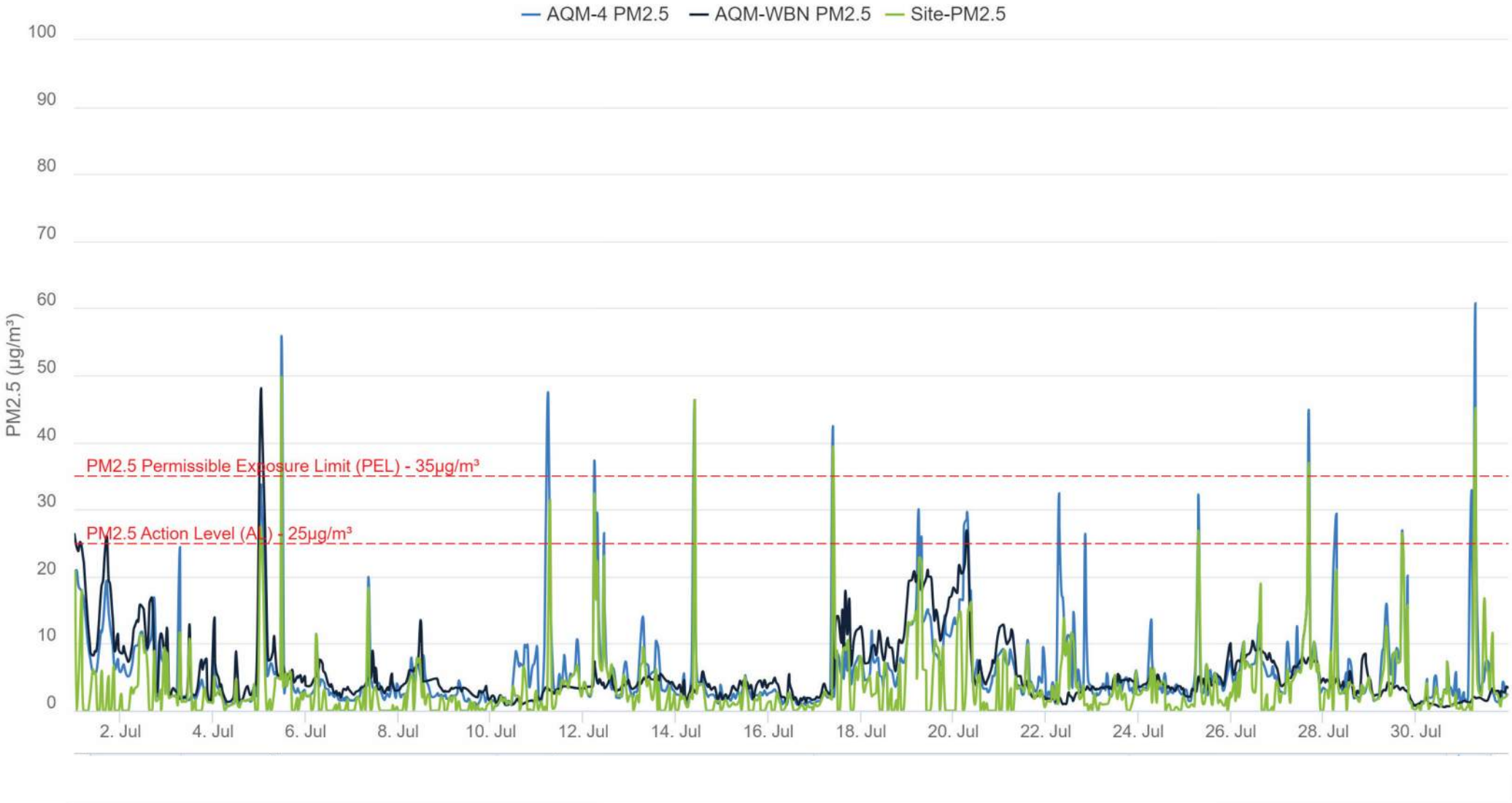
Reach C,D,& E - PM2.5 - 15 min Running Avg. (July 2023)

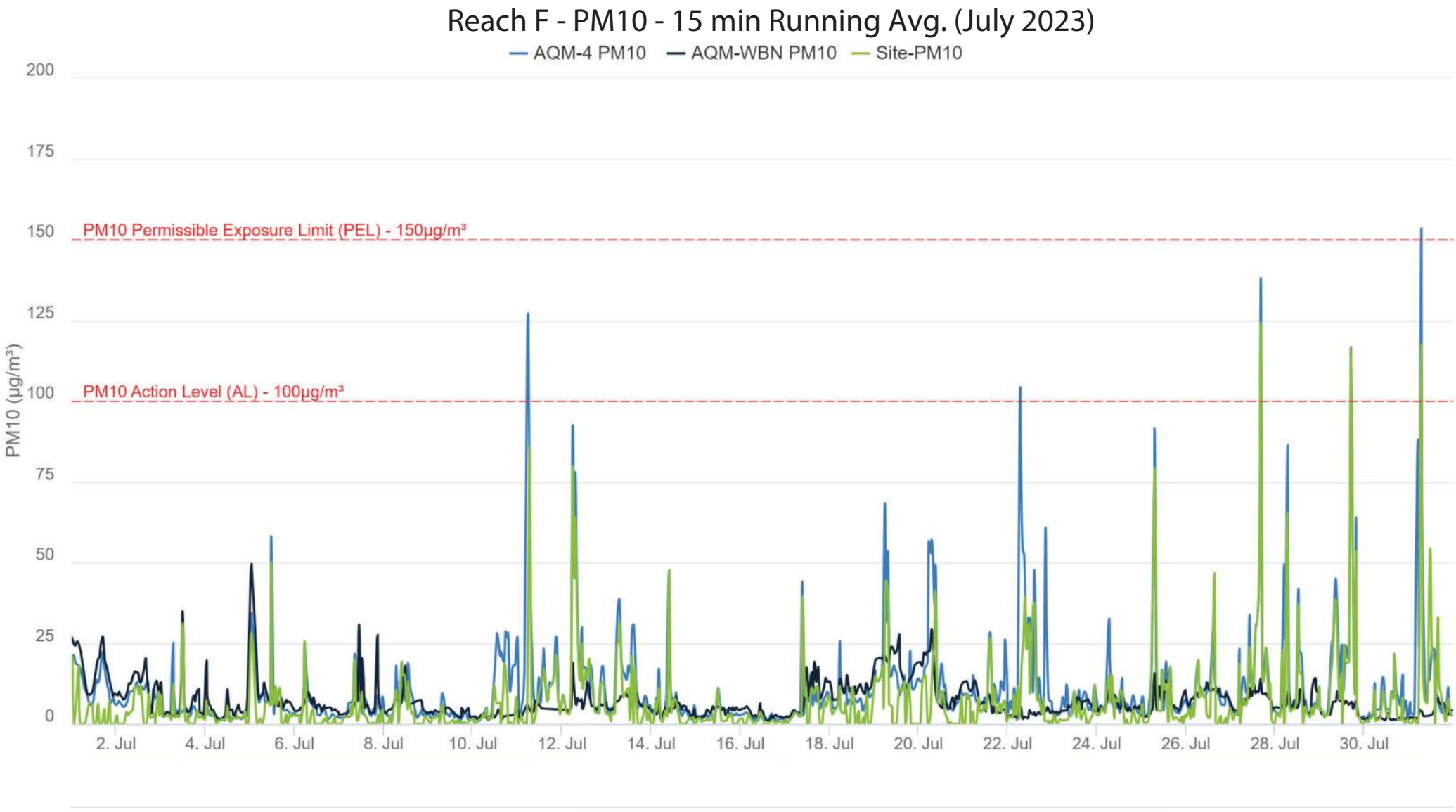


Reach C,D,& E - PM10 - 15 min Running Avg. (July 2023)

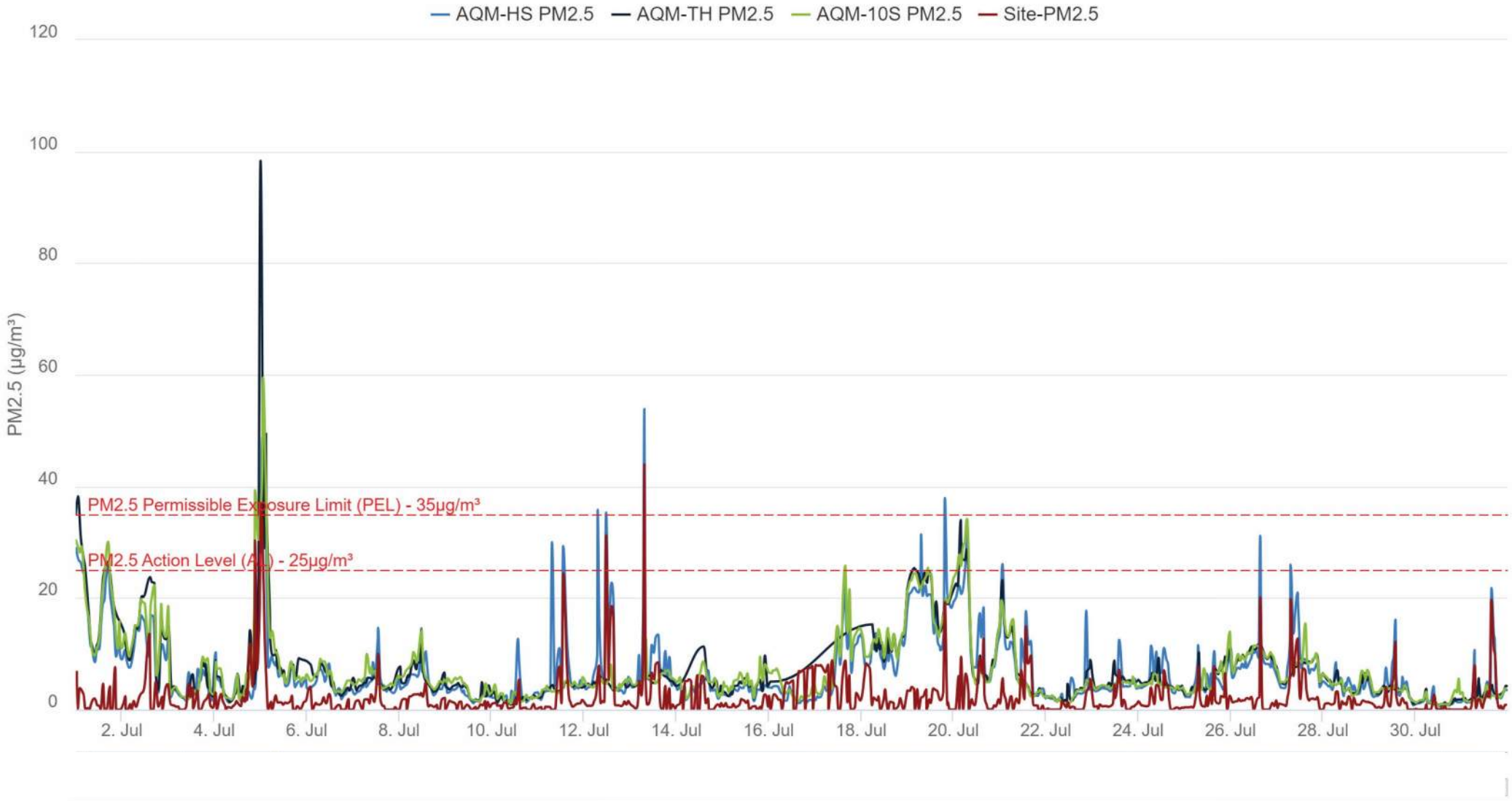


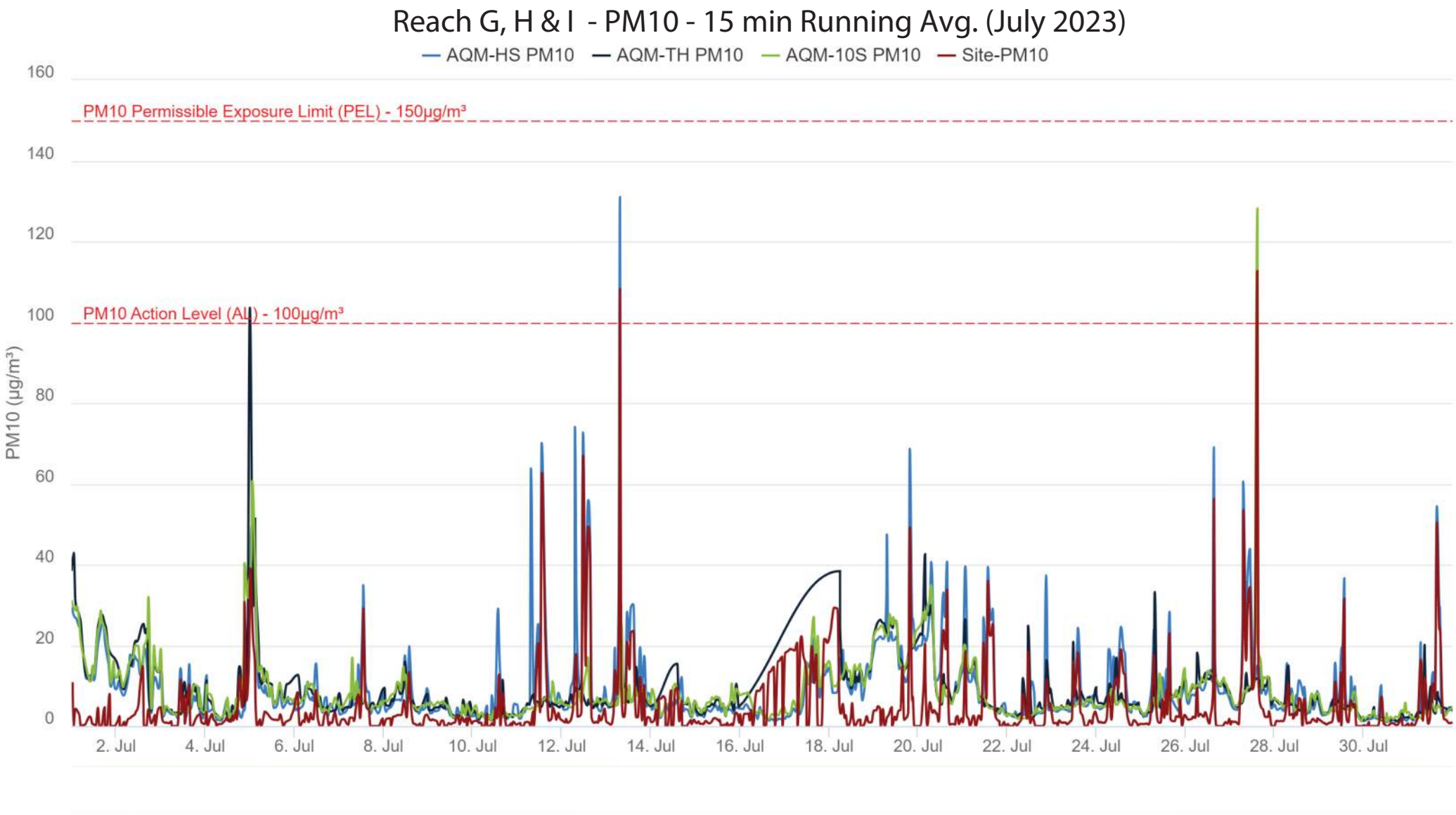
Reach F - PM2.5 - 15 min Running Avg. (July 2023)




Reach F - PM10 - 15 min Running Avg. (July 2023)
AQM-4 PM10
AQM-WBN PM10
Site-PM10
200
175
150
125
100
75
50
25
0
PM10 (µg/m³)
PM10 Permissible Exposure Limit (PEL) - 150µg/m³
PM10 Action Level (AL) - 100µg/m³
2. Jul
4. Jul
6. Jul
8. Jul
10. Jul
12. Jul
14. Jul
16. Jul
18. Jul
20. Jul
22. Jul
24. Jul
26. Jul
28. Jul
30. Jul

Reach G, H & I - PM2.5 - 15 min Running Avg. (July 2023)




Reach G, H & I - PM10 - 15 min Running Avg. (July 2023)
AQM-HS PM10
AQM-TH PM10
AQM-10S PM10
Site-PM10
PM10 Permissible Exposure Limit (PEL) - 150µg/m³
PM10 Action Level (AL) - 100µg/m³
PM10 (µg/m³)
160
140
120
100
80
60
40
20
0
2. Jul
4. Jul
6. Jul
8. Jul
10. Jul
12. Jul
14. Jul
16. Jul
18. Jul
20. Jul
22. Jul
24. Jul
26. Jul
28. Jul
30. Jul

Summary of Data August 2023

PM2.5 levels surpassed the PEL (15-minute TWA) at the following locations:

- AQM-1 on 8/2 for 15 minutes, 8/4 for 20 minutes, 8/7 for 19 minutes, 8/17 for 19 minutes, 8/24 for 16 and 18 minutes, 8/28 for 15 minutes, 8/30 for 5 minutes, and 8/31 for 30 and 20 minutes;
- AQM-CHR on 8/4 for 17 minutes, 8/5 for 14 minutes, 8/10 for 80 minutes, 8/24 for 15 minutes, 8/28 for 41, 15, 54, and 23 minutes, and 8/29 for 23 minutes;
- AQM-4 on 8/2 for 19 minutes, 8/14 for 22 minutes, and 8/22 for 24 minutes; and
- AQM-AT on 8/2 for 21 minutes.

PM10 levels surpassed the PEL (15-minute TWA) at the following locations:

- AQM-1 on 8/7 for 14 minutes, 8/17 for 13 minutes, 8/24 for 16 minutes, 8/28 for 33 minutes, and 8/31 for 30 and 20 minutes;
- AQM-CHR on 8/10 for 80 minutes, 8/14 for 42 minutes, 8/24 for 15 minutes, 8/28 for 43, 16, 16, 54, and 23 minutes, and 8/29 for 23 minutes;
- AQM-AT on 8/2 for 23 minutes;
- AQM-3 on 8/18 for 74 minutes and 8/30 for 4 minutes; and
- AQM-10S on 8/2 for 17 minutes.

<u>For the month of August 2023, PM net 2.5 levels were exceeded on 8/2, 8/4, 8/5, 8/7, 8/10, 8/14, 8/22, 8/24, 8/28, 8/30, and 8/31. PM net 10 levels were exceeded on 8/2, 8/7, 8/10, 8/14, 8/17, 8/18, 8/24, 8/28, 8/29, 8/30, and 8/31.</u>

<u>For the month of August 2023, construction-related PM net 2.5 or 10 levels did not surpass the Daily PEL (24-hour TWA).</u>

PM 2.5 µg/m^3

- PM 2.5 µg/m^3 levels surpassed the PEL on 23 occasions (8/2, 8/4, 8/5, 8/7, 8/10, 8/14, 8/22, 8/24, 8/28, 8/30, and 8/31) for between 5 and 80 minutes.
    - AQM-1 is located near the site access gate at Gouverneur Slip West and adjacent to another construction site and an FDR entry ramp.
        - The elevated readings on 8/2, 8/4, 8/7, 8/24, and 8/31 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
        - The elevated readings on 8/28 were related to onsite construction activities. A water truck was deployed to mitigate airborne dust.
        - The elevated readings on 8/30 were related to anomalous readings related to air quality monitor power status.
    - AQM-CHR is located on the construction access road/shared use path in Reach B.
        - Elevated readings on 8/10 were related to offsite construction activity under a different contract. A water truck was deployed to mitigate airborne dust.
        - Elevated readings on 8/4, 8/5, 8/24, 8/28, and 8/29 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
        - The elevated readings on 8/28 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
    - AQM-4 is located near the former Tennis house along the shared use path/construction access road and the FDR; the elevated readings on 8/2, 8/14, and 8/22 were caused by vehicle traffic onsite and on the FDR. A water truck was deployed to mitigate airborne.

- AQM-AT is located near the former amphitheater and Corlears Hook pedestrian bridge; the elevated readings on 8/2 were related to anomalous readings related to air quality monitor power status.

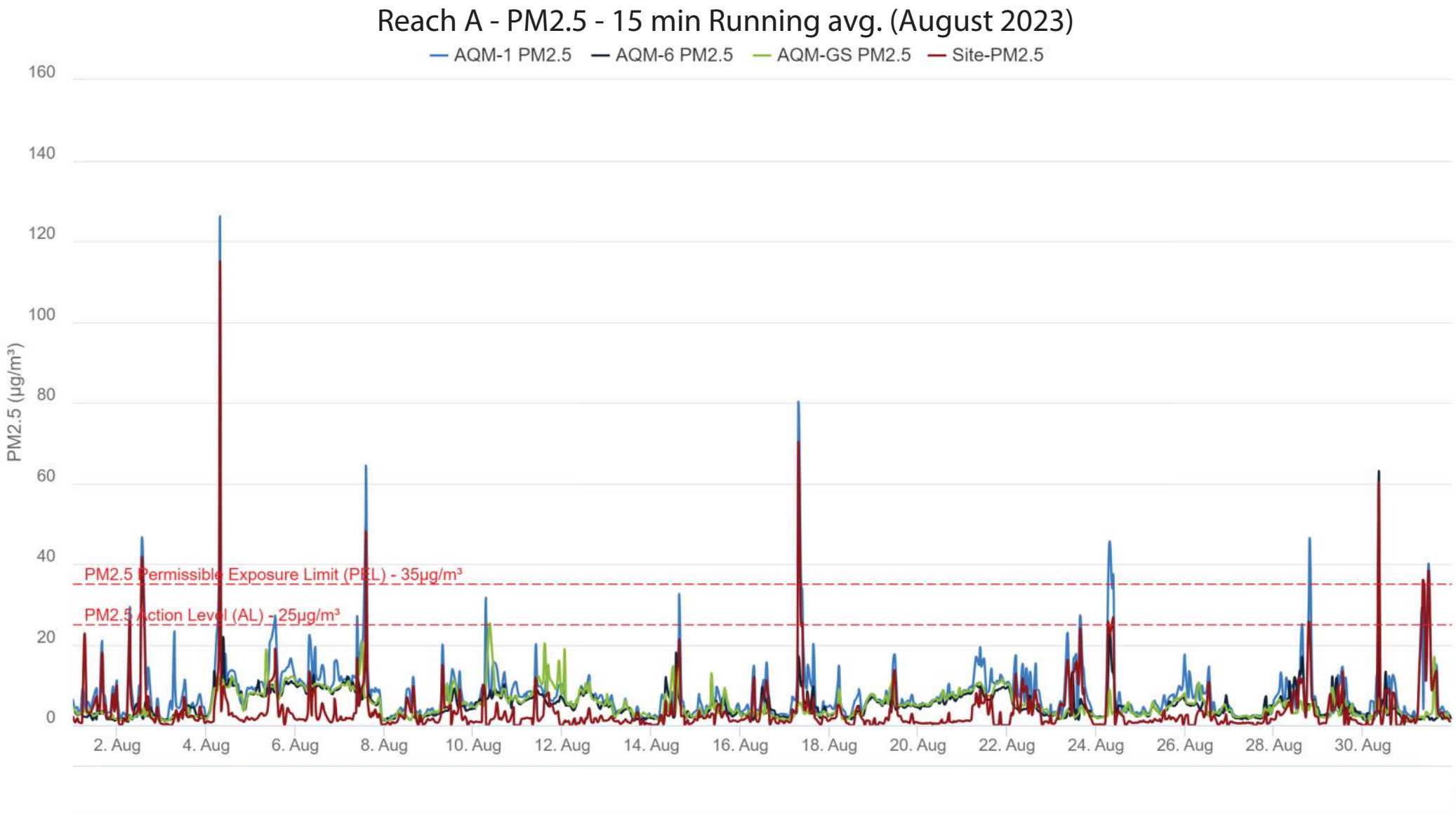
PM 10 µg/m^3

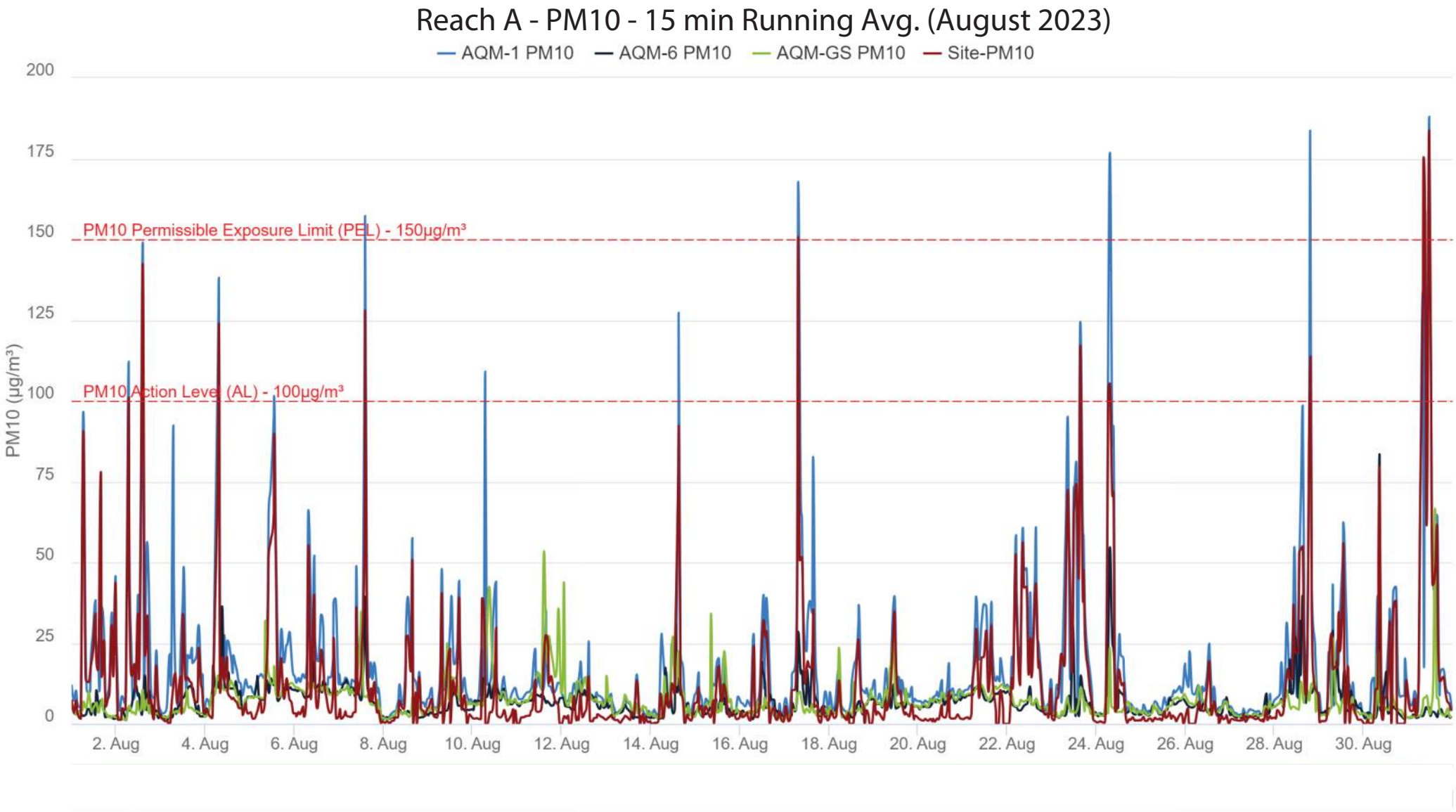
- PM 10 µg/m^3 levels surpassed the PEL on 19 occasions (8/2, 8/7, 8/10, 8/14, 8/17, 8/18, 8/24, 8/28, 8/29, 8/30, and 8/31) for between 4 and 80 minutes:
  - AQM-1 is located near the site access gate at Gouverneur Slip West and adjacent to another construction site and an FDR entry ramp.
    - The elevated readings on 8/7, 8/17, 8/24, and 8/31 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
    - The elevated readings on 8/28 were related to onsite construction activities. A water truck was deployed to mitigate airborne dust.
  - AQM-CHR is located on the construction access road/shared use path in Reach B.
    - The elevated readings on 8/14, 8/24, 8/28, and 8/29 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
    - The elevated readings on 8/10 were related to third-party off-site construction activities. A water truck was deployed to mitigate airborne dust.
    - The elevated readings on 8/28 were related to anomalous readings related to air quality monitor power status.
    - The elevated readings on 8/28 were related to onsite construction activities. A water truck was deployed to mitigate airborne dust.
  - AQM-AT is located near the former amphitheater and Corlears Hook pedestrian bridge; the elevated readings on 8/2 were related to anomalous readings related to air quality monitor power status.
  - AQM-3 is located is located west of the FDR on Delancey Street.
    - The elevated readings on 8/30 were related to anomalous readings related to air quality monitor power status.
    - The elevated readings on 8/18 were related to onsite construction activities. A water truck was deployed to mitigate airborne dust.
  - AQM-10S is located west of the FDR on East 10th Street; the elevated readings on 8/18 were related to onsite construction activities. A water truck was deployed to mitigate airborne dust.

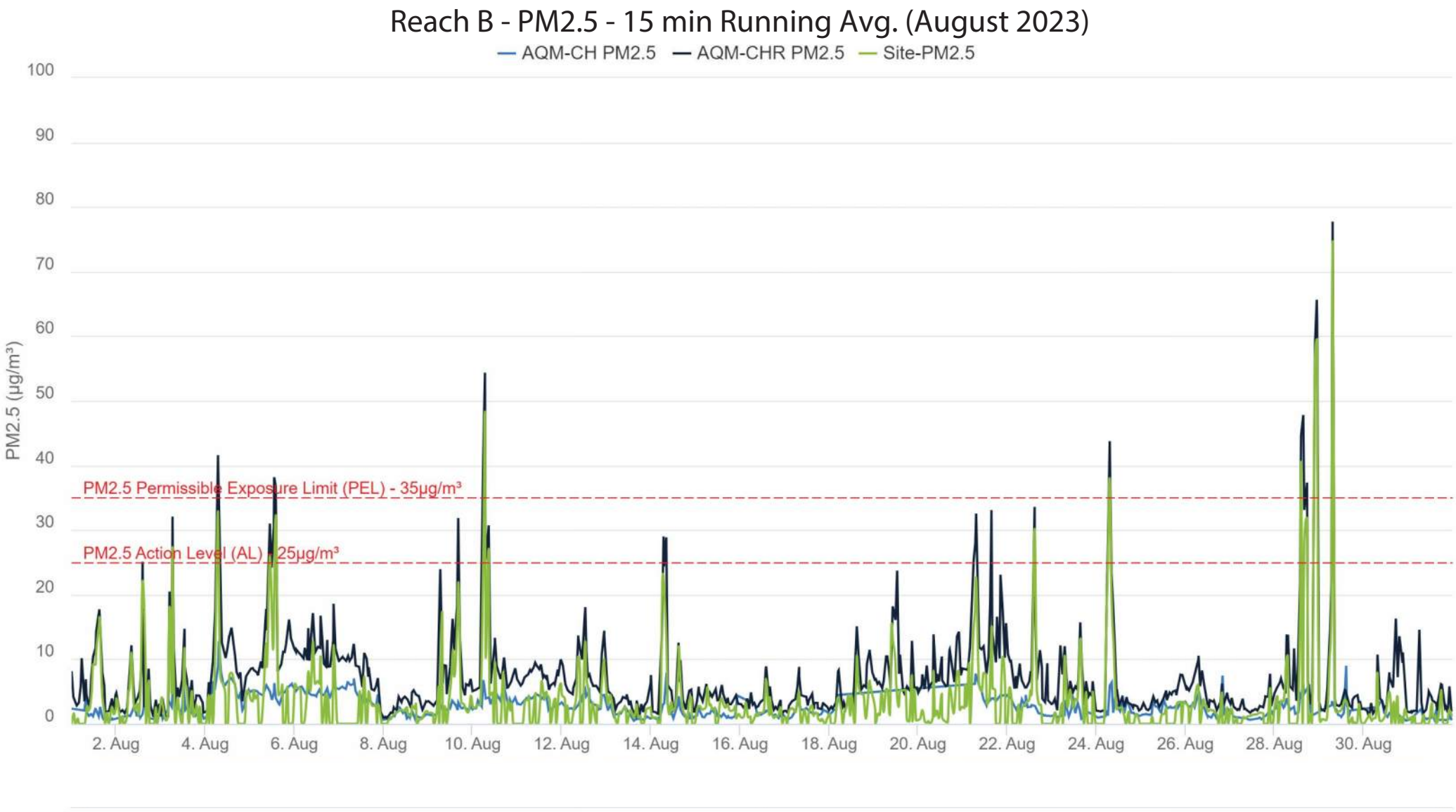
Mitigation Measures:

- Throughout the month, construction activity was closely monitored, and dust mitigation techniques were continuously implemented to successfully contain any airborne particulates created due to construction activity.

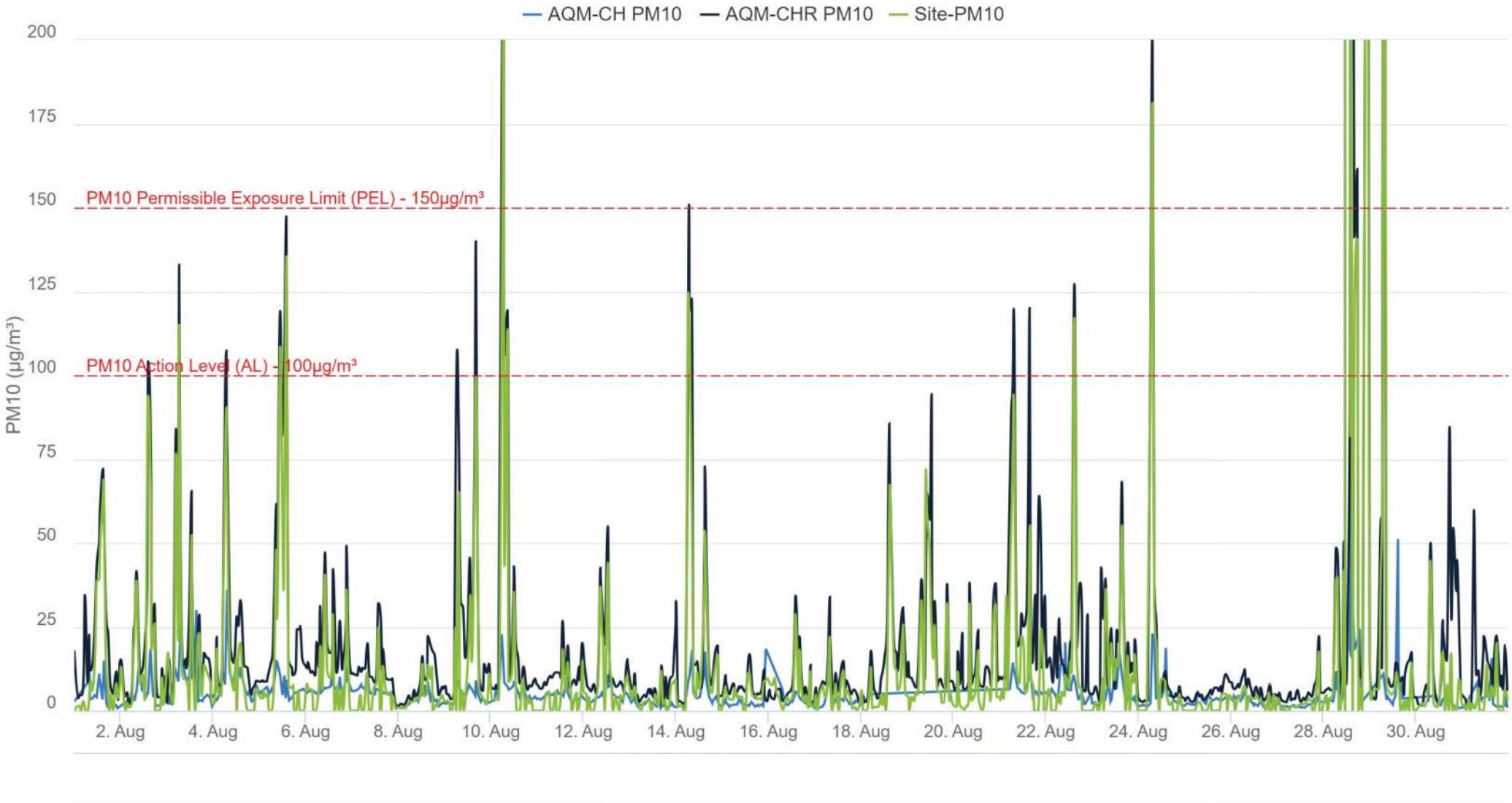
AUGUST 2023 DATA PLOTS


Reach A - PM2.5 - 15 min Running avg. (August 2023)
AQM-1 PM2.5
AQM-6 PM2.5
AQM-GS PM2.5
Site-PM2.5
PM2.5 (µg/m³)
160
140
120
100
80
60
40
20
0
PM2.5 Permissible Exposure Limit (PEL) - 35µg/m³
PM2.5 Action Level (AL) - 25µg/m³
2. Aug
4. Aug
6. Aug
8. Aug
10. Aug
12. Aug
14. Aug
16. Aug
18. Aug
20. Aug
22. Aug
24. Aug
26. Aug
28. Aug
30. Aug

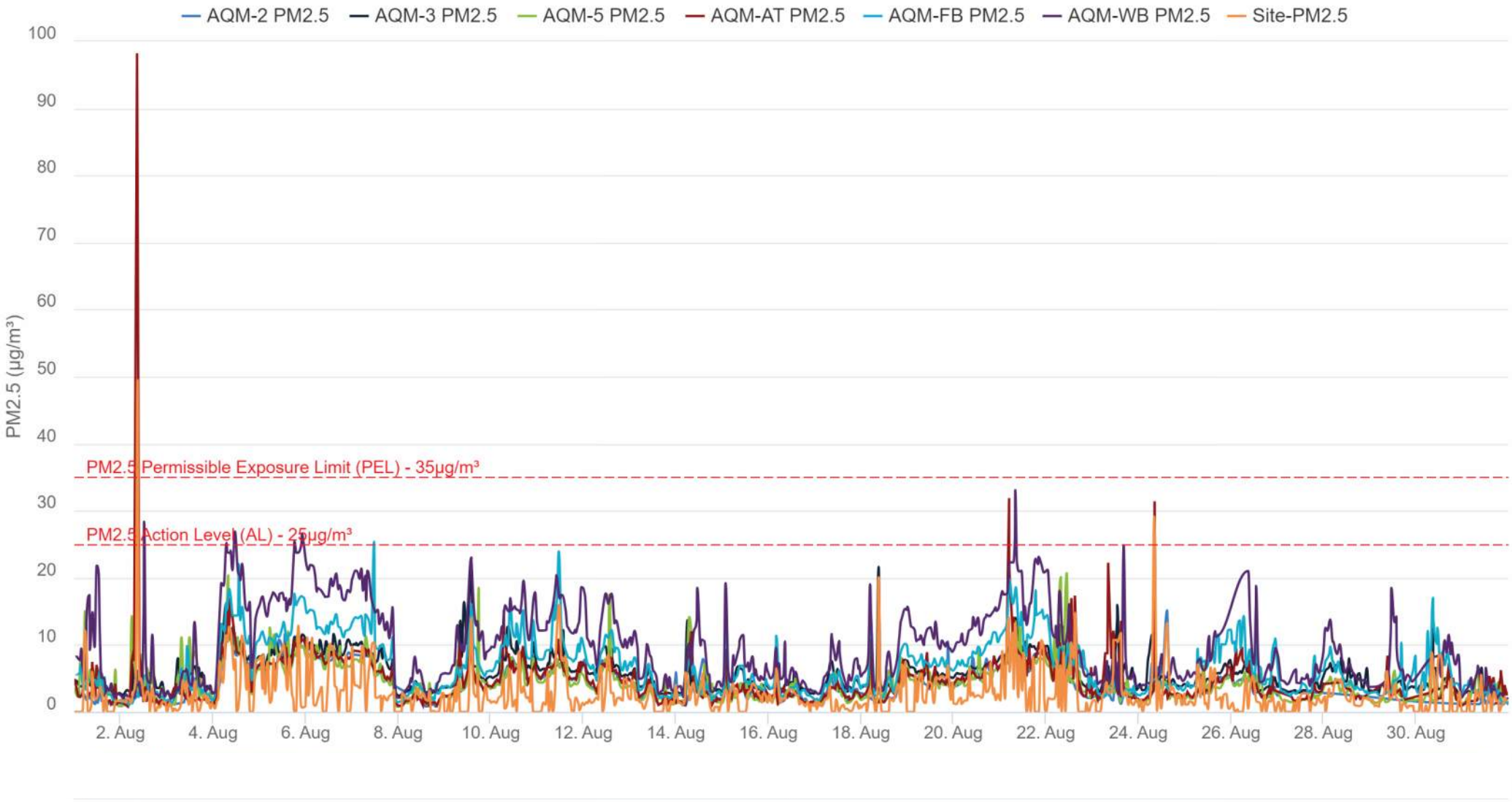

Reach A - PM10 - 15 min Running Avg. (August 2023)
AQM-1 PM10
AQM-6 PM10
AQM-GS PM10
Site-PM10
PM10 Permissible Exposure Limit (PEL) - 150µg/m³
PM10 Action Level (AL) - 100µg/m³
PM10 (µg/m³)
200
175
150
125
100
75
50
25
0
2. Aug
4. Aug
6. Aug
8. Aug
10. Aug
12. Aug
14. Aug
16. Aug
18. Aug
20. Aug
22. Aug
24. Aug
26. Aug
28. Aug
30. Aug


Reach B - PM2.5 - 15 min Running Avg. (August 2023)
AQM-CH PM2.5
AQM-CHR PM2.5
Site-PM2.5
PM2.5 (µg/m³)
100
90
80
70
60
50
40
30
20
10
0
PM2.5 Permissible Exposure Limit (PEL) - 35µg/m³
PM2.5 Action Level (AL) - 25µg/m³
2. Aug
4. Aug
6. Aug
8. Aug
10. Aug
12. Aug
14. Aug
16. Aug
18. Aug
20. Aug
22. Aug
24. Aug
26. Aug
28. Aug
30. Aug

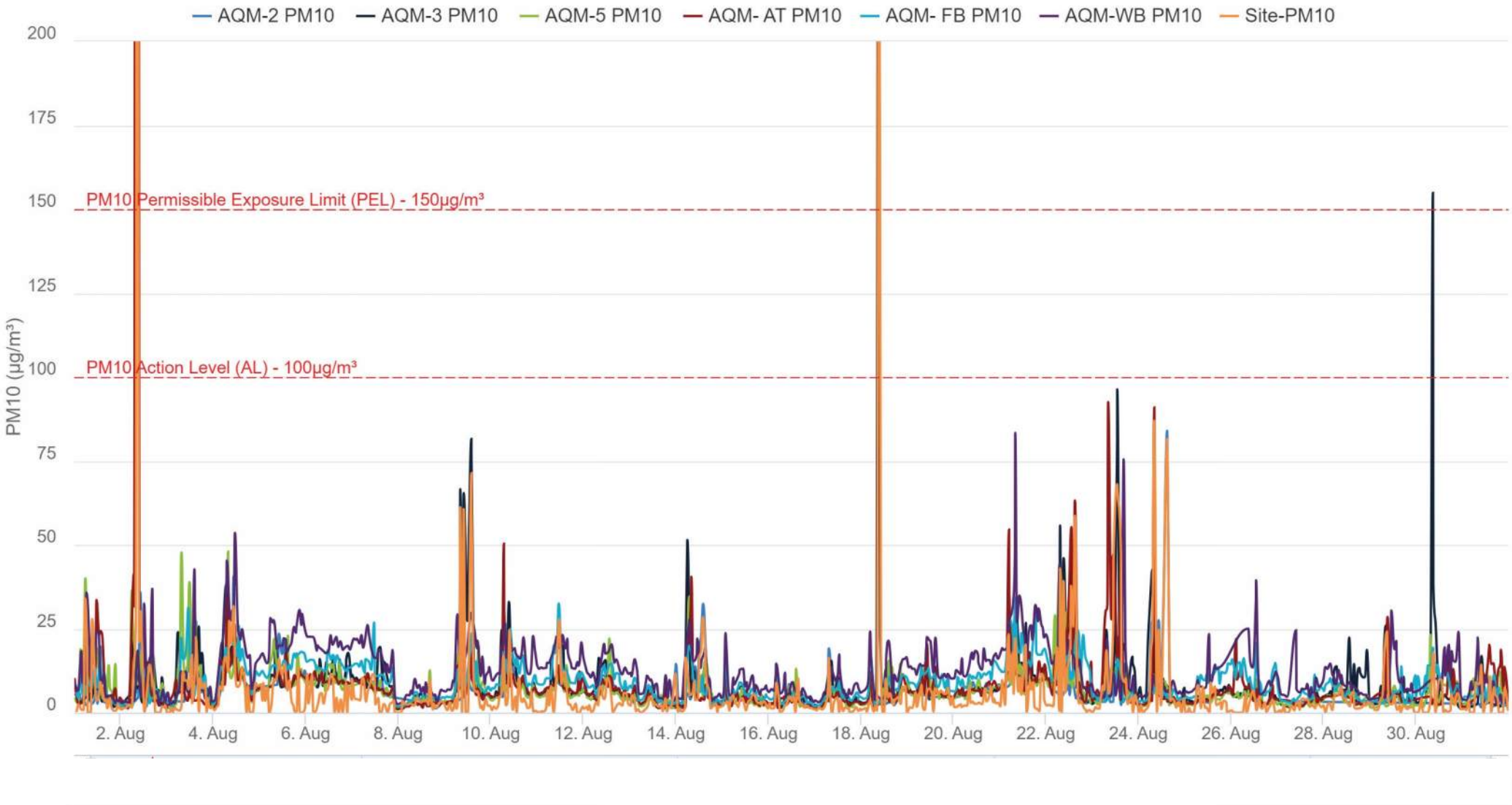
Reach B - PM10 - 15 min Running avg. (August 2023)



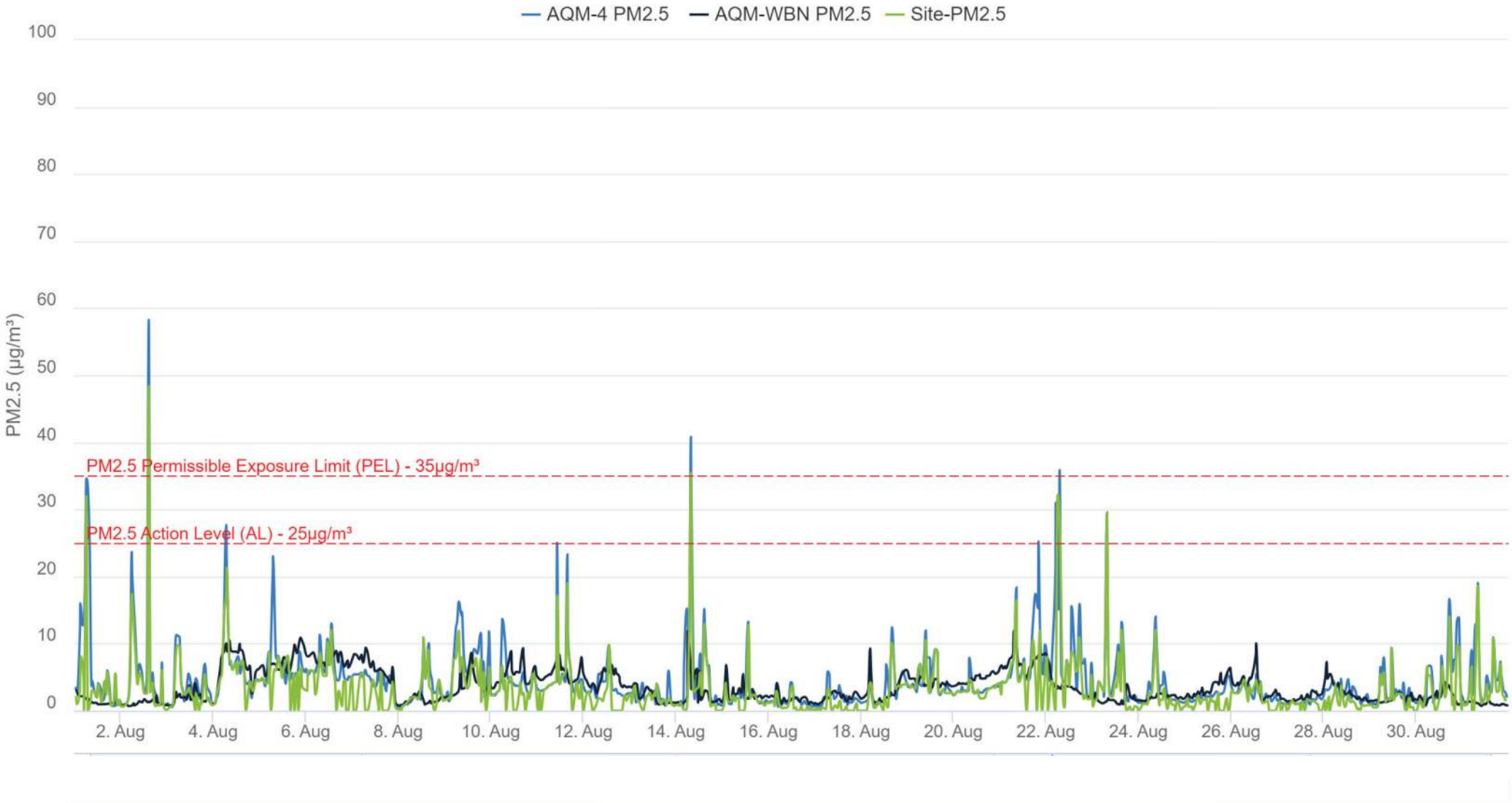
Reach C,D,& E - PM2.5 - 15 min Running Avg. (August 2023)



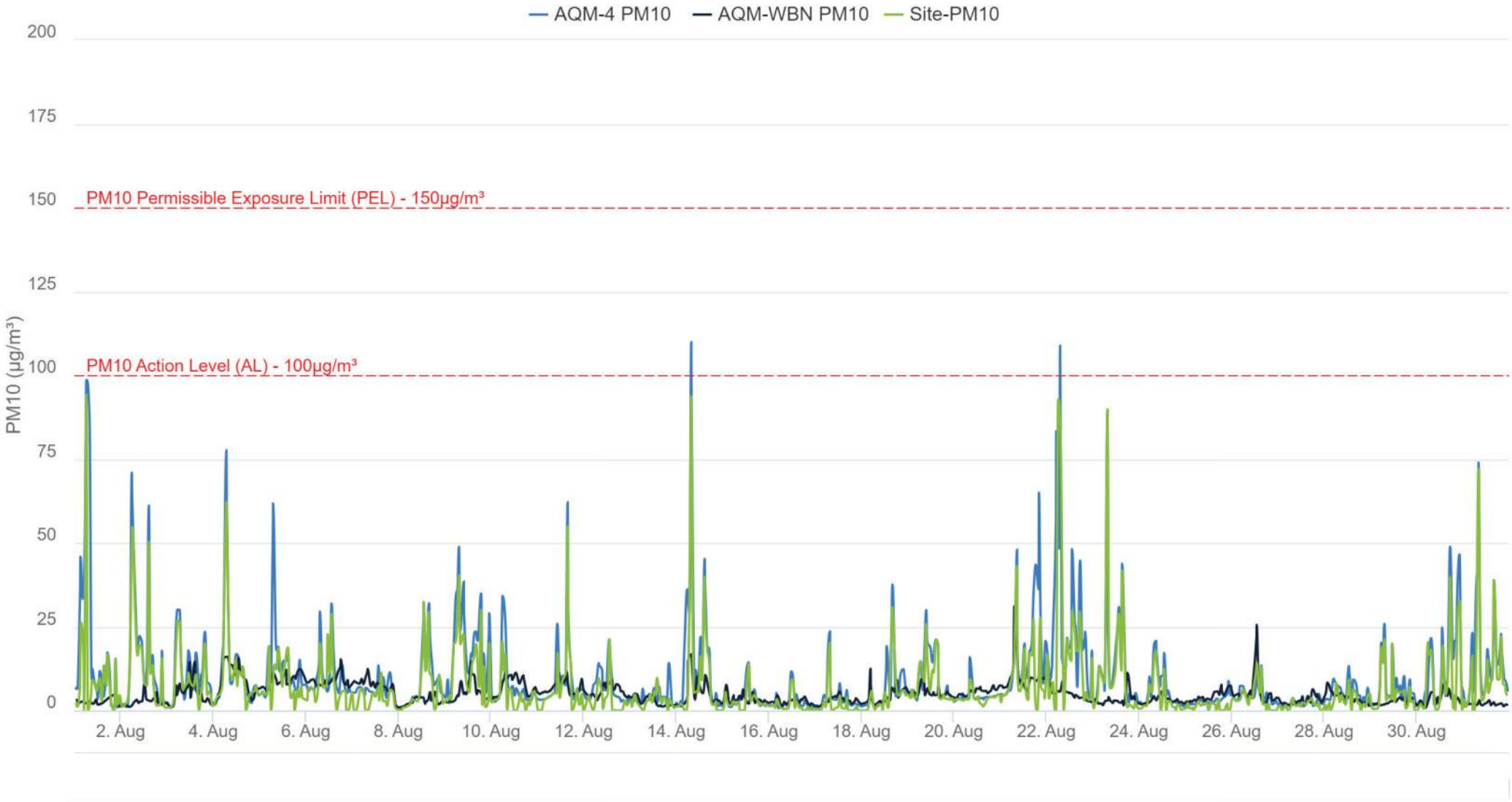
Reach C,D,& E - PM10 - 15 min Running avg. (August 2023)



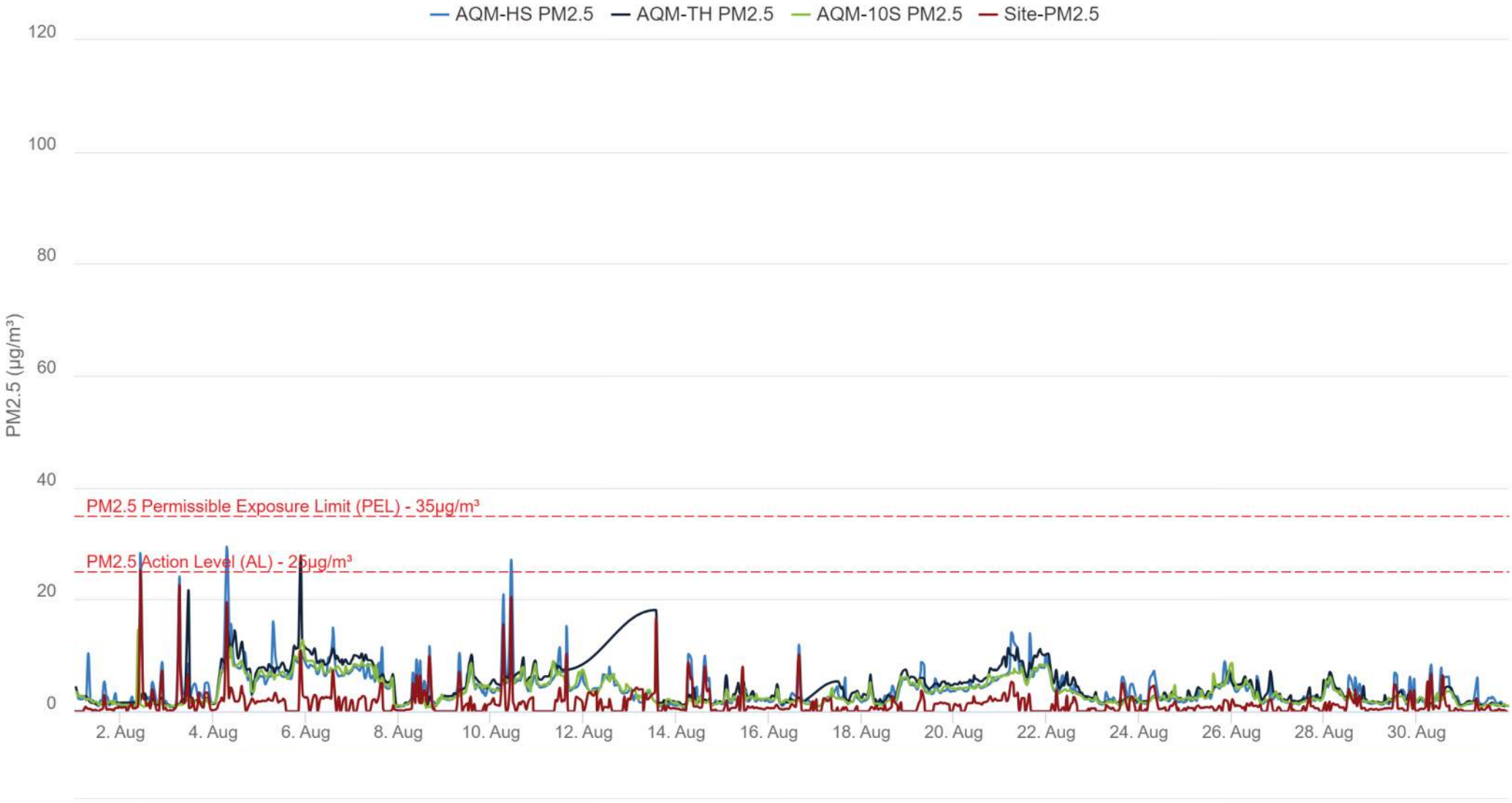
Reach F - PM2.5 - 15 min Running avg. (August 2023)

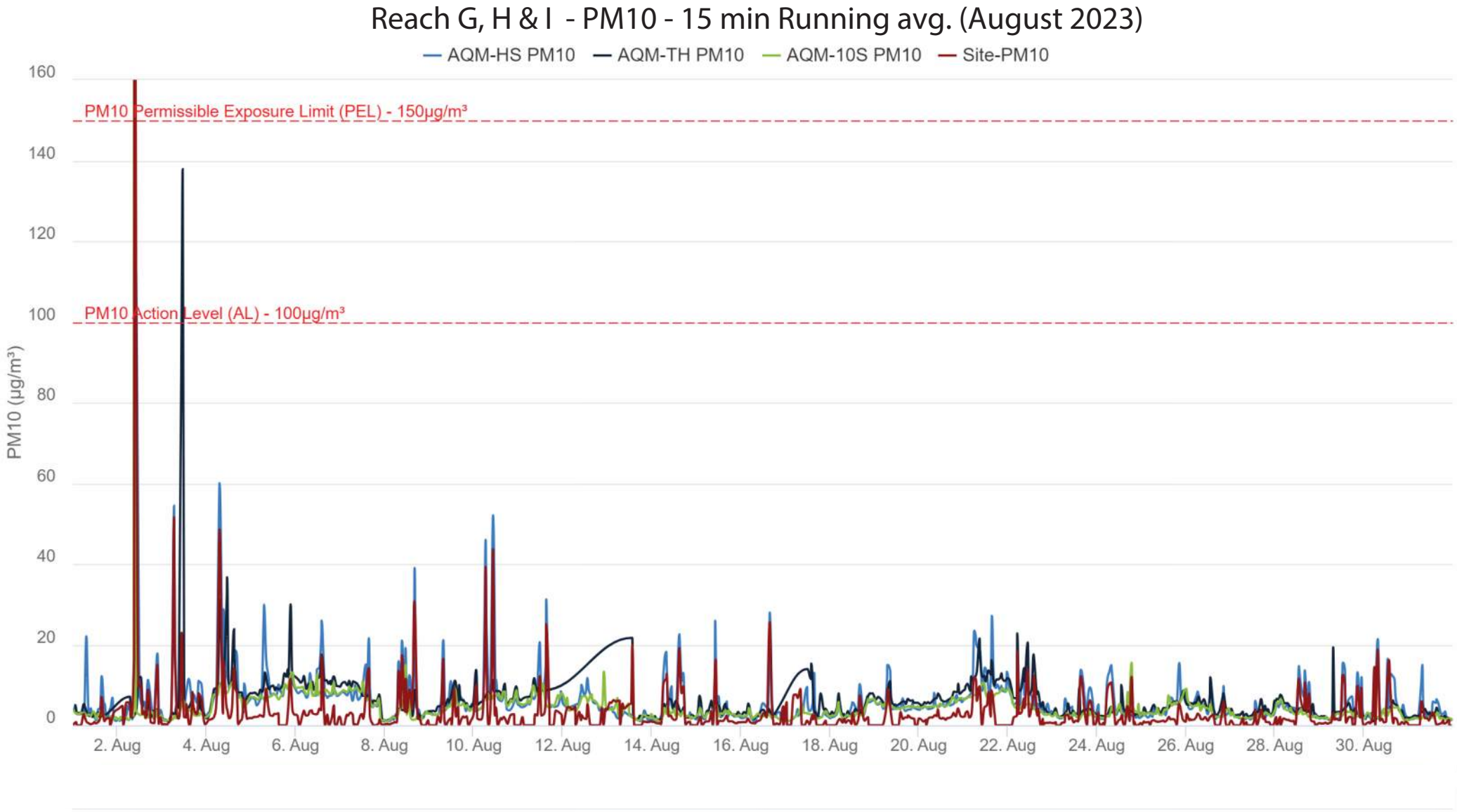


Reach F - PM10 - 15 min Running avg. (August 2023)



Reach G, H & I - PM2.5 - 15 min Running avg. (August 2023)




Reach G, H & I - PM10 - 15 min Running avg. (August 2023)
AQM-HS PM10
AQM-TH PM10
AQM-10S PM10
Site-PM10
PM10 Permissible Exposure Limit (PEL) - 150µg/m³
PM10 Action Level (AL) - 100µg/m³
PM10 (µg/m³)
160
140
120
100
80
60
40
20
0
2. Aug
4. Aug
6. Aug
8. Aug
10. Aug
12. Aug
14. Aug
16. Aug
18. Aug
20. Aug
22. Aug
24. Aug
26. Aug
28. Aug
30. Aug

Summary of Data September 2023

PM2.5 levels surpassed the PEL (15-minute TWA) at the following locations:

- AQM-1 on 9/7 for 17 minutes, 9/20 for 11 minutes, 9/21 for 14 minutes, 9/22 for 20 minutes, 9/23 for 18 minutes, 9/27 for 104 minutes, and 9/28 for 30 minutes;
- AQM-CHR on 9/5 for 16 minutes, 9/6 for 38 minutes, 9/7 for 15 and 29 minutes, 9/8 for 30 minutes, 9/16 for 16 minutes, and 9/30 for 9 minutes;
- AQM-FB on 9/7 for 14 minutes;
- AQM-2 on 9/8 for 15 minutes
- AQM-4 on 9/14 for 16 minutes and 9/15 for 22 minutes; and
- AQM-HS on 9/3 for 17 minutes, 9/16 for 15 minutes, and 9/27 for 26 minutes.

PM10 levels surpassed the PEL (15-minute TWA) at the following locations:

- AQM-1 on 9/7 for 15 minutes, 9/15 for 19 minutes, 9/23 for 16 minutes, and 9/28 for 13 minutes;
- AQM-CHR on 9/5 for 16 minutes, 9/7 for 15 and 29 minutes, 9/8 for 32 minutes, 9/16 for 41 minutes, and 9/29 for 45 and 46 minutes;
- AQM-2 on 9/17 for 16 minutes;
- AQM-3 on 9/15 for 15 minutes;
- AQM-4 on 9/4 for 15 minutes; and
- AQM-HS on 9/3 for 16 minutes and 9/14 for 14 minutes.

For the month of September 2023, PM net 2.5 levels were exceeded on 9/3, 9/5, 9/6, 9/7, 9/8, 9/14, 9/15, 9/16, 9/20, 9/21, 9/22, 9/23, 9/27, 9/28, and 9/30. PM net 10 levels were exceeded on 9/3, 9/5, 9/7, 9/8, 9/14, 9/15, 9/16, 9/23, 9/28, and 9/29.

For the month of September 2023, construction-related PM net 2.5 or 10 levels did not surpass the Daily PEL (24-hour TWA).

PM 2.5 µg/m^3

- PM 2.5 µg/m^3 levels surpassed the PEL (15-minute TWA) on 21 occasions 9/3, 9/5, 9/6, 9/7, 9/8, 9/14, 9/15, 9/16, 9/20, 9/21, 9/22, 9/23, 9/27, 9/28, and 9/30) for between 9 and 104 minutes.
    - AQM-1 is located near the site access gate at Gouverneur Slip West and adjacent to another construction site and an FDR entry ramp.
        - Elevated readings on 9/20, 9/21, and 9/22 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
        - Elevated readings on 9/7, 9/23, 9/27, and 9/28 were related to onsite construction activity. A water truck was deployed to mitigate airborne dust.
    - AQM-CHR is located on the construction access road/shared use path in Reach B.
        - Elevated readings on 9/16 were related to onsite construction vehicle traffic.
        - Elevated readings on 9/5, 9/6 and 9/8 were related to offsite activity.
        - Elevated readings on 9/30 were related to anomalous readings related to air quality monitor power status.
        - Elevated readings on 9/7 were related to onsite construction activity. A water truck was deployed to mitigate airborne dust.
    - AQM-FB is located in the vicinity of the Fire Boat House; the elevated readings on 9/7 were due to onsite construction activities. A water truck was deployed to mitigate airborne dust.

- AQM-4 is located near the former Tennis house along the shared use path/construction access road and the FDR; the elevated readings on 9/14 and 9/15 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
- AQM-2 is located in Corlears Hook Park adjacent to Cherry Street; the elevated readings on 9/8 was related to third-party offsite construction activity after construction hours in the vicinity of the monitor.
- AQM-HS is located near the Houston Street ramp at the exit to the construction on the FDR.
    - The elevated readings on 9/27 were caused by onsite construction activities A water truck was deployed to mitigate airborne dust.
    - The elevated readings on 9/16 were related to offsite activities.
    - The elevated readings on 9/3 were related to traffic on the FDR.

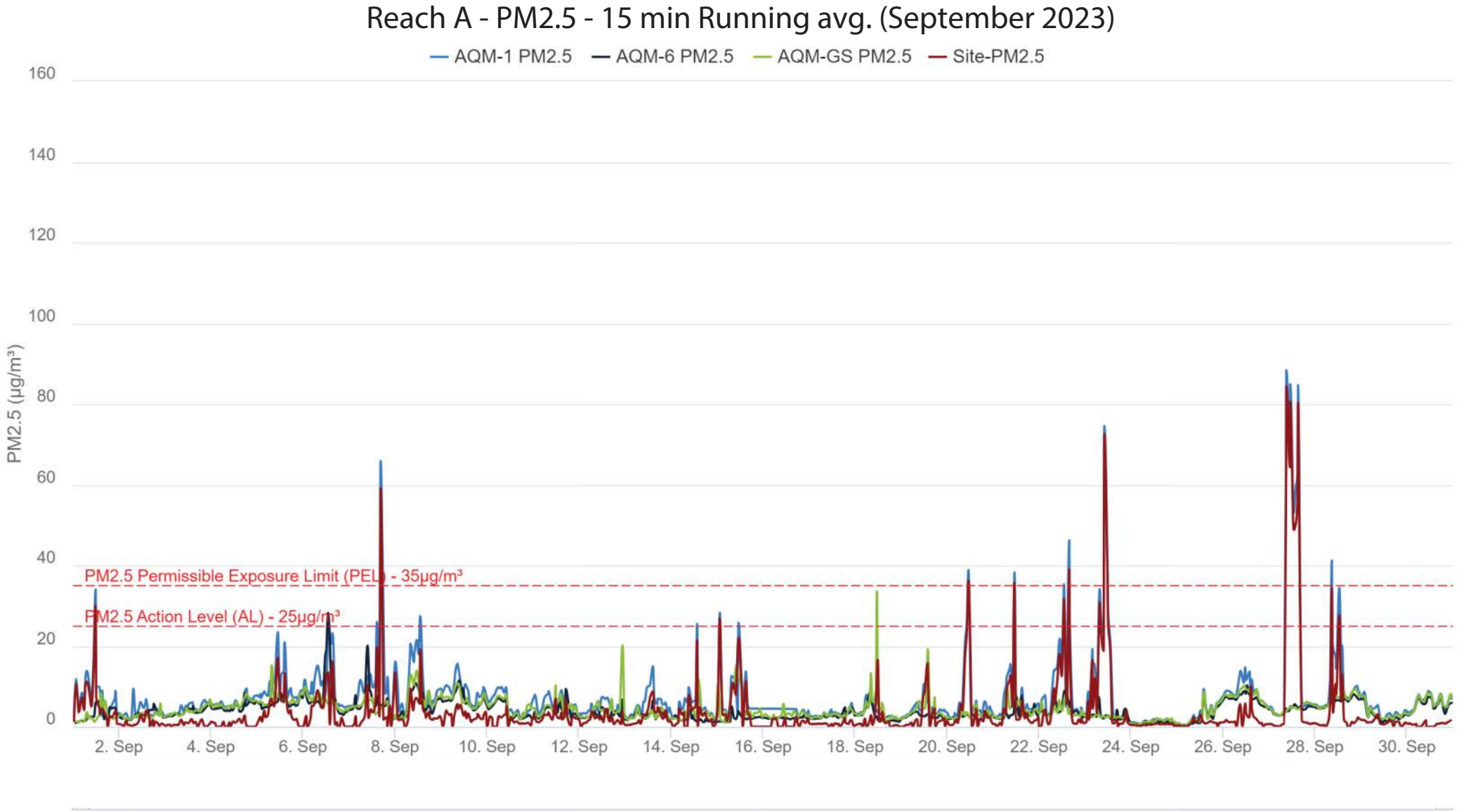
PM 10 µg/m^3

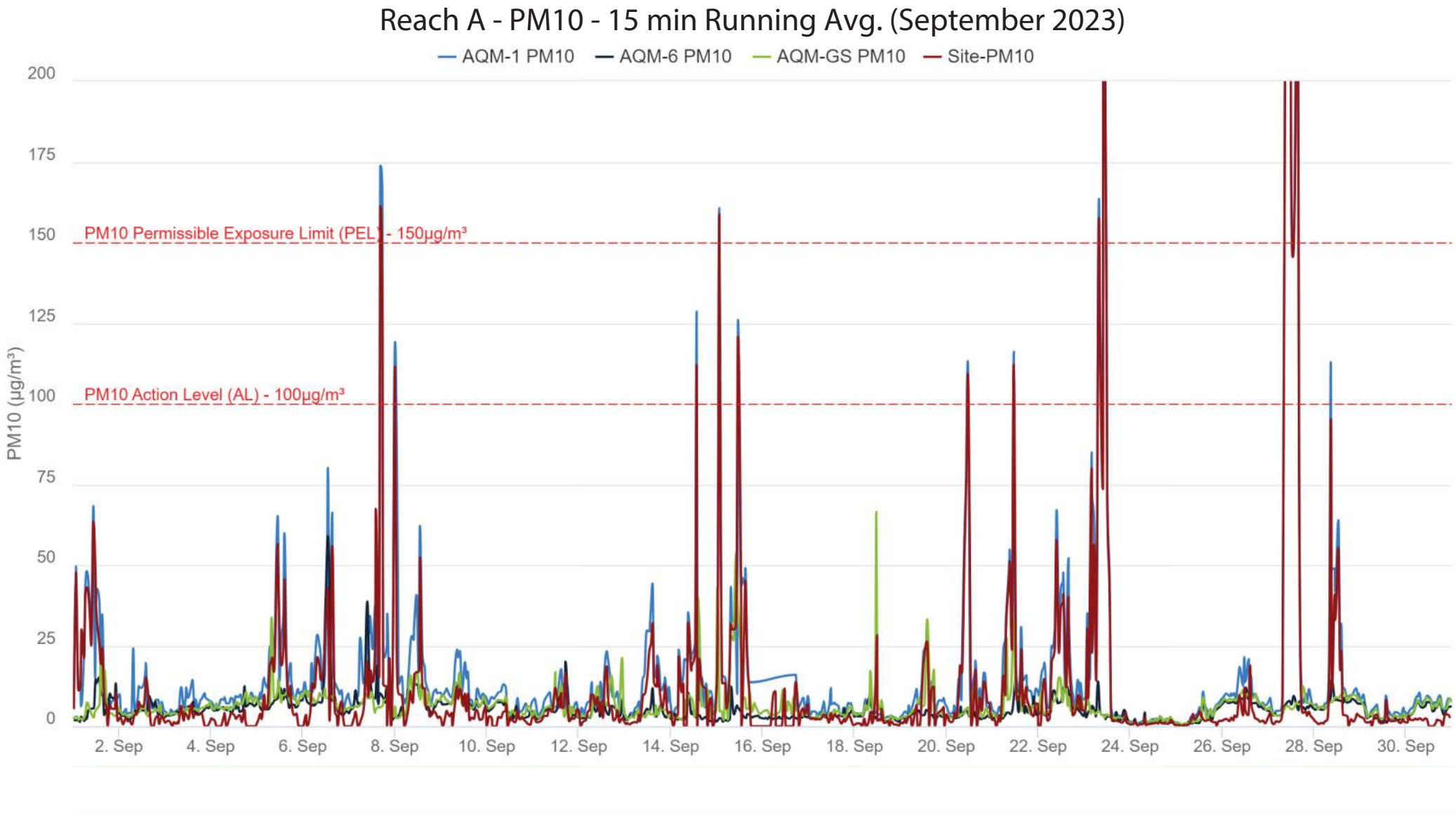
- PM 10 µg/m^3 levels surpassed the PEL (15-minute TWA) on 17 occasions (9/3, 9/5, 9/7, 9/8, 9/14, 9/15, 9/16, 9/23, 9/28, and 9/29) for between 13 and 66 minutes.
    - AQM-1 is located near the site access gate at Gouverneur Slip West and adjacent to another construction site and an FDR entry ramp.
        - Elevated readings on 9/7, 9/23 and 9/28 were related to onsite construction activity. A water truck was deployed to mitigate airborne dust.
        - Elevated readings on 9/15 were related to offsite activity.
    - AQM-CHR is located on the construction access road/shared use path in Reach B.
        - Elevated readings on 9/5 and 9/16 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
        - Elevated readings on 9/29 were related to vehicle traffic on the FDR.
        - Elevated readings on 9/7 were related to onsite construction activity. A water truck was deployed to mitigate airborne dust.
        - Elevated readings on 9/8 were related to offsite activity.
    - AQM-2 is located in Corlears Hook Park adjacent to Cherry Street; the elevated readings on 9/7 was related to third-party offsite construction activity in the vicinity of the monitor.
    - AQM-3 is located is located west of the FDR on Delancey Street; the elevated readings on 9/15 were related to third-party offsite construction activity in the vicinity of the monitor.
    - AQM-4 is located near the former Tennis house along the shared use path/construction access road and the FDR; the elevated readings 9/4 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.

Mitigation Measures

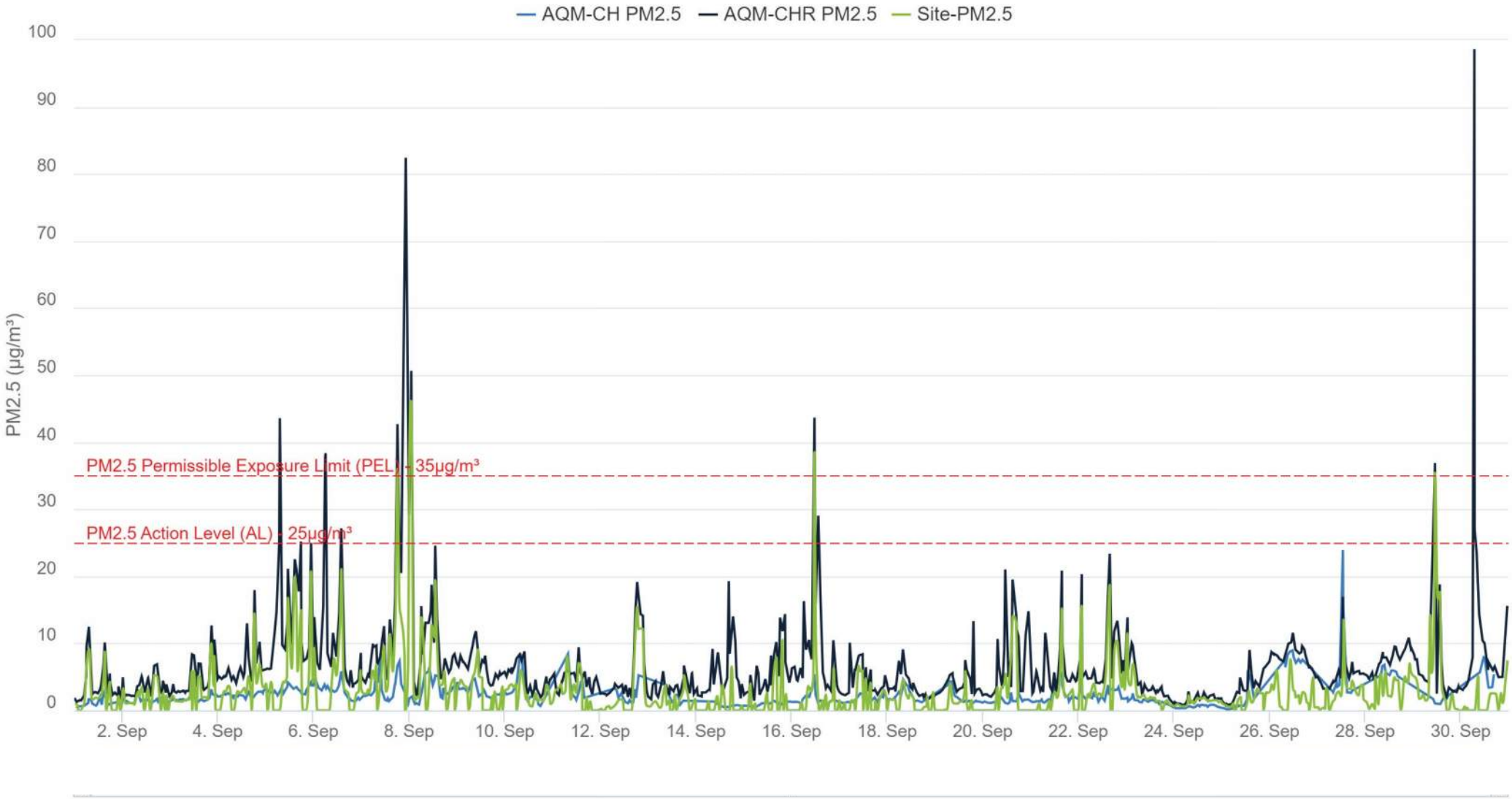
- Throughout the month, construction activity was closely monitored, and dust mitigation techniques were continuously implemented to successfully contain any airborne particulates created due to construction activity.

SEPTEMBER 2023 DATA PLOTS

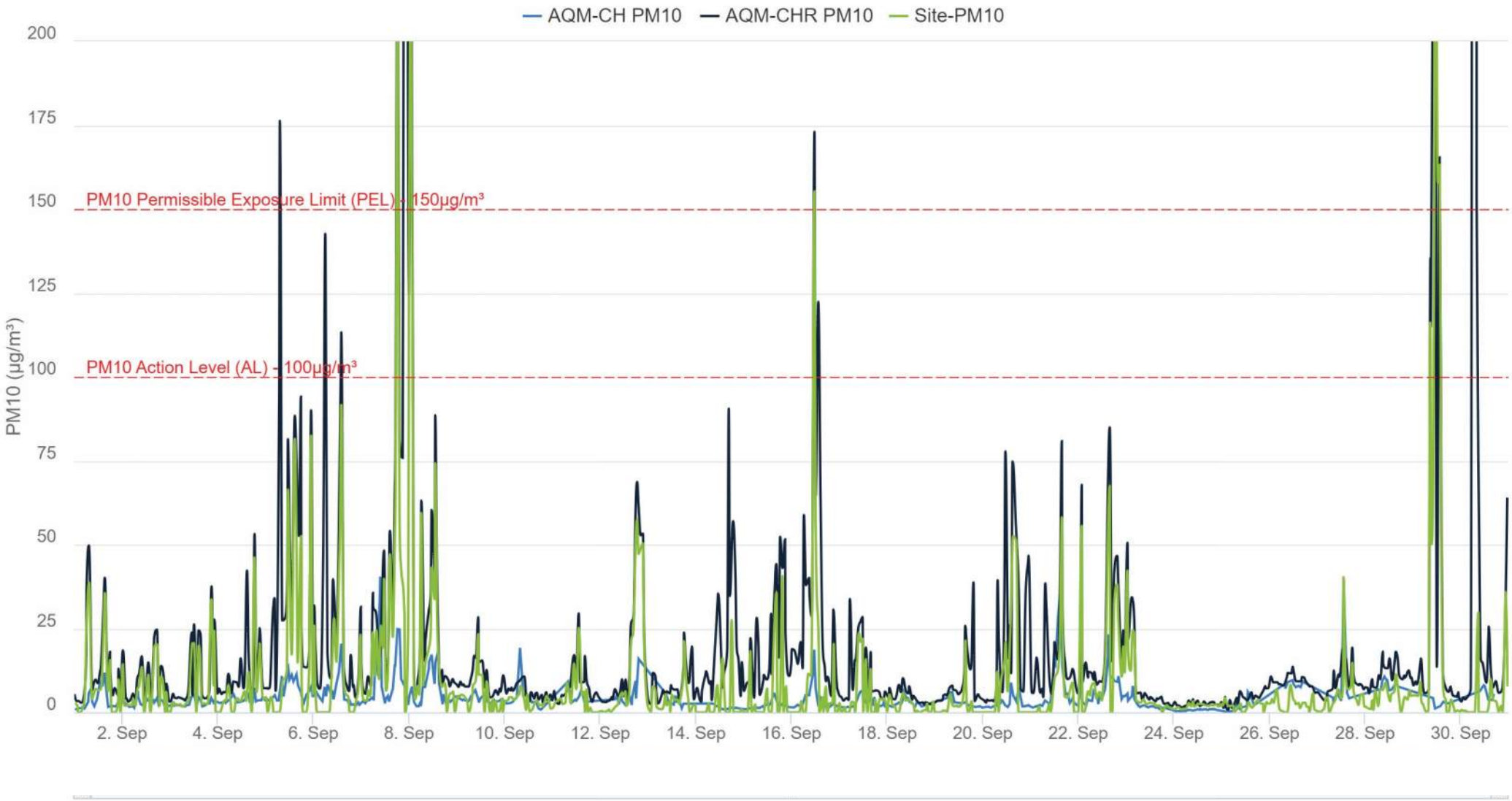

Reach A - PM2.5 - 15 min Running avg. (September 2023)
AQM-1 PM2.5
AQM-6 PM2.5
AQM-GS PM2.5
Site-PM2.5
160
140
120
100
80
60
40
20
0
PM2.5 (µg/m³)
PM2.5 Permissible Exposure Limit (PEL) - 35µg/m³
PM2.5 Action Level (AL) - 25µg/m³
2. Sep
4. Sep
6. Sep
8. Sep
10. Sep
12. Sep
14. Sep
16. Sep
18. Sep
20. Sep
22. Sep
24. Sep
26. Sep
28. Sep
30. Sep

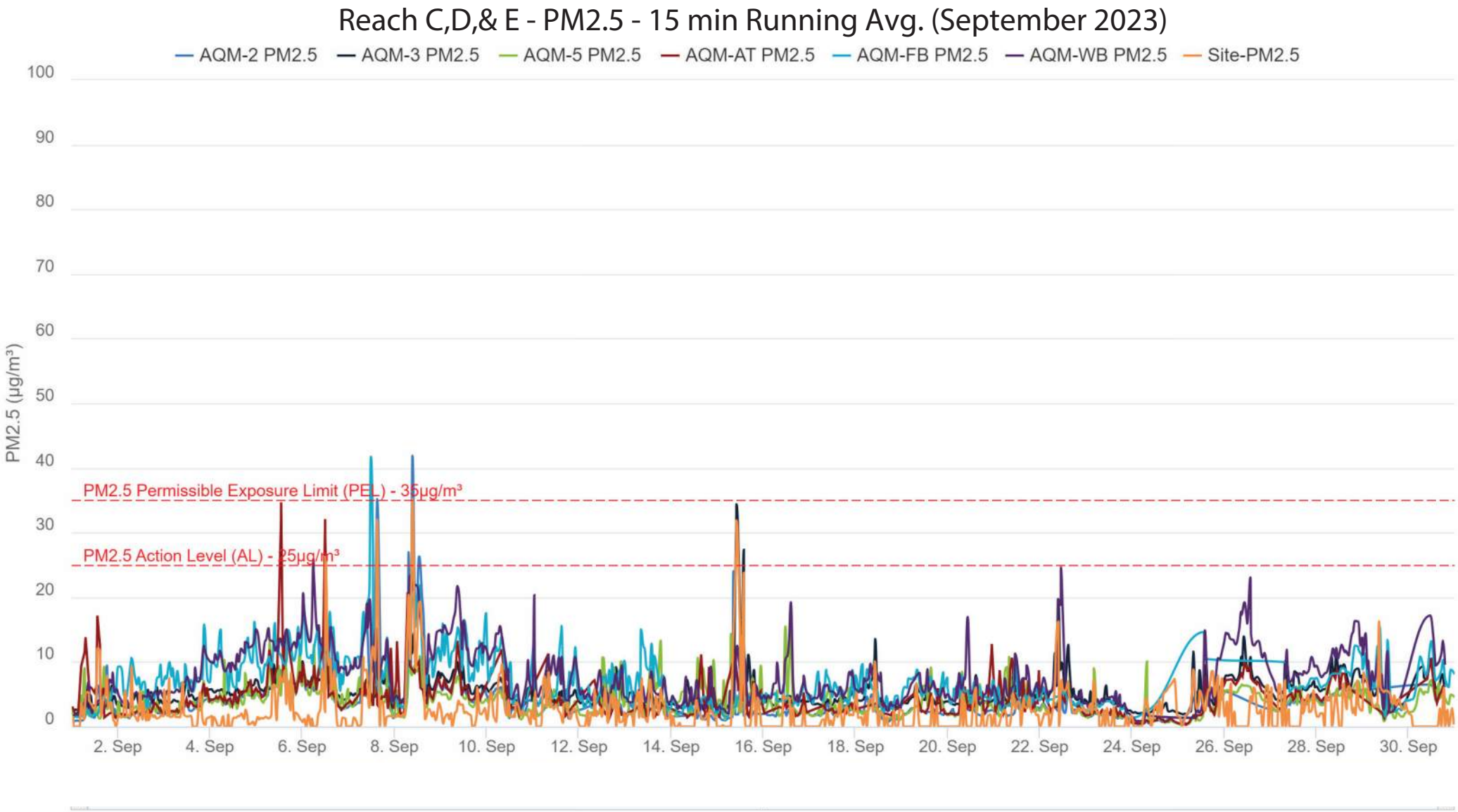

Reach A - PM10 - 15 min Running Avg. (September 2023)
AQM-1 PM10
AQM-6 PM10
AQM-GS PM10
Site-PM10
PM10 (µg/m³)
200
175
150
125
100
75
50
25
0
PM10 Permissible Exposure Limit (PEL) - 150µg/m³
PM10 Action Level (AL) - 100µg/m³
2. Sep
4. Sep
6. Sep
8. Sep
10. Sep
12. Sep
14. Sep
16. Sep
18. Sep
20. Sep
22. Sep
24. Sep
26. Sep
28. Sep
30. Sep

Reach B - PM2.5 - 15 min Running Avg. (September 2023)

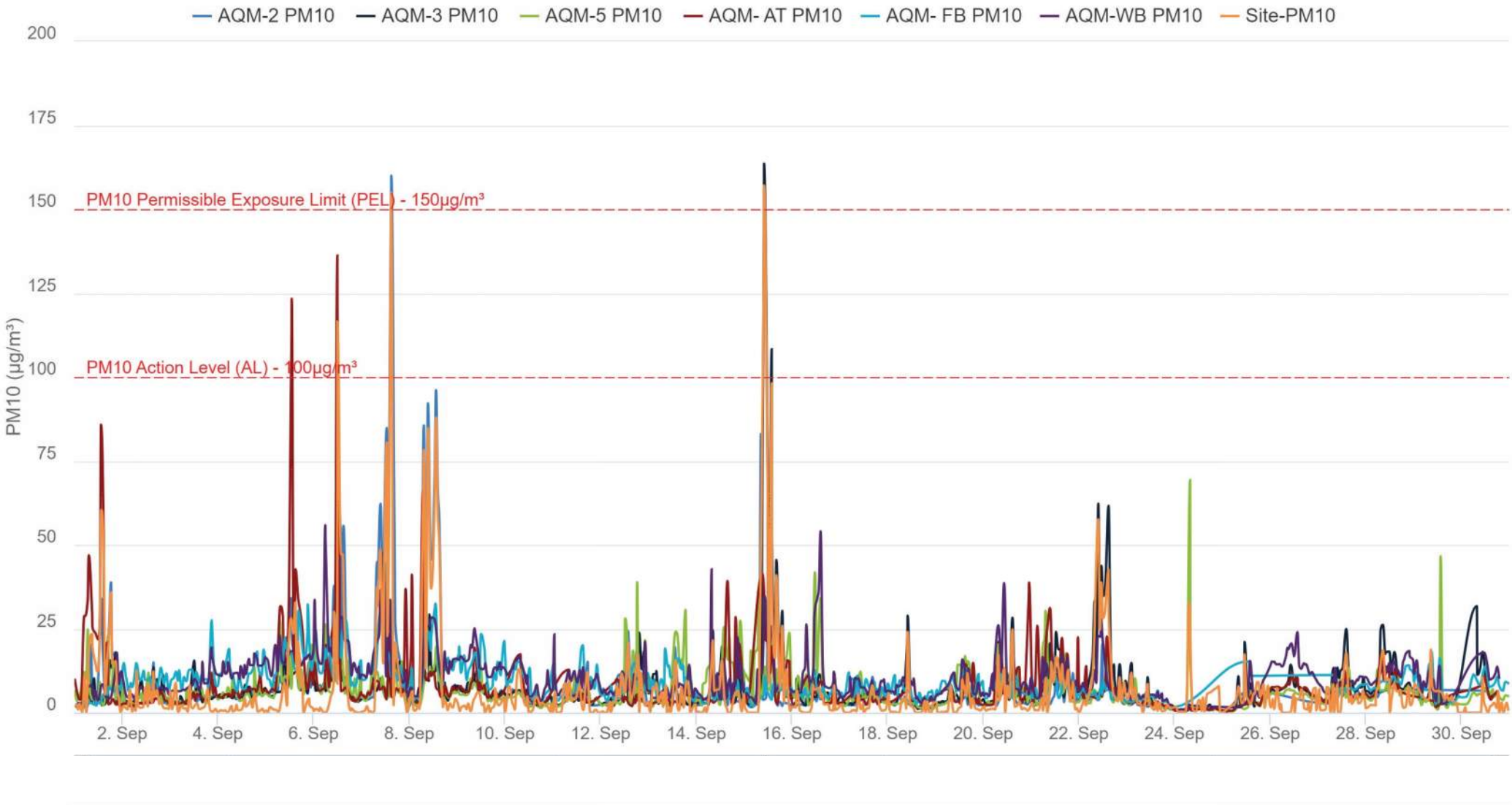


Reach B - PM10 - 15 min Running avg. (September 2023)

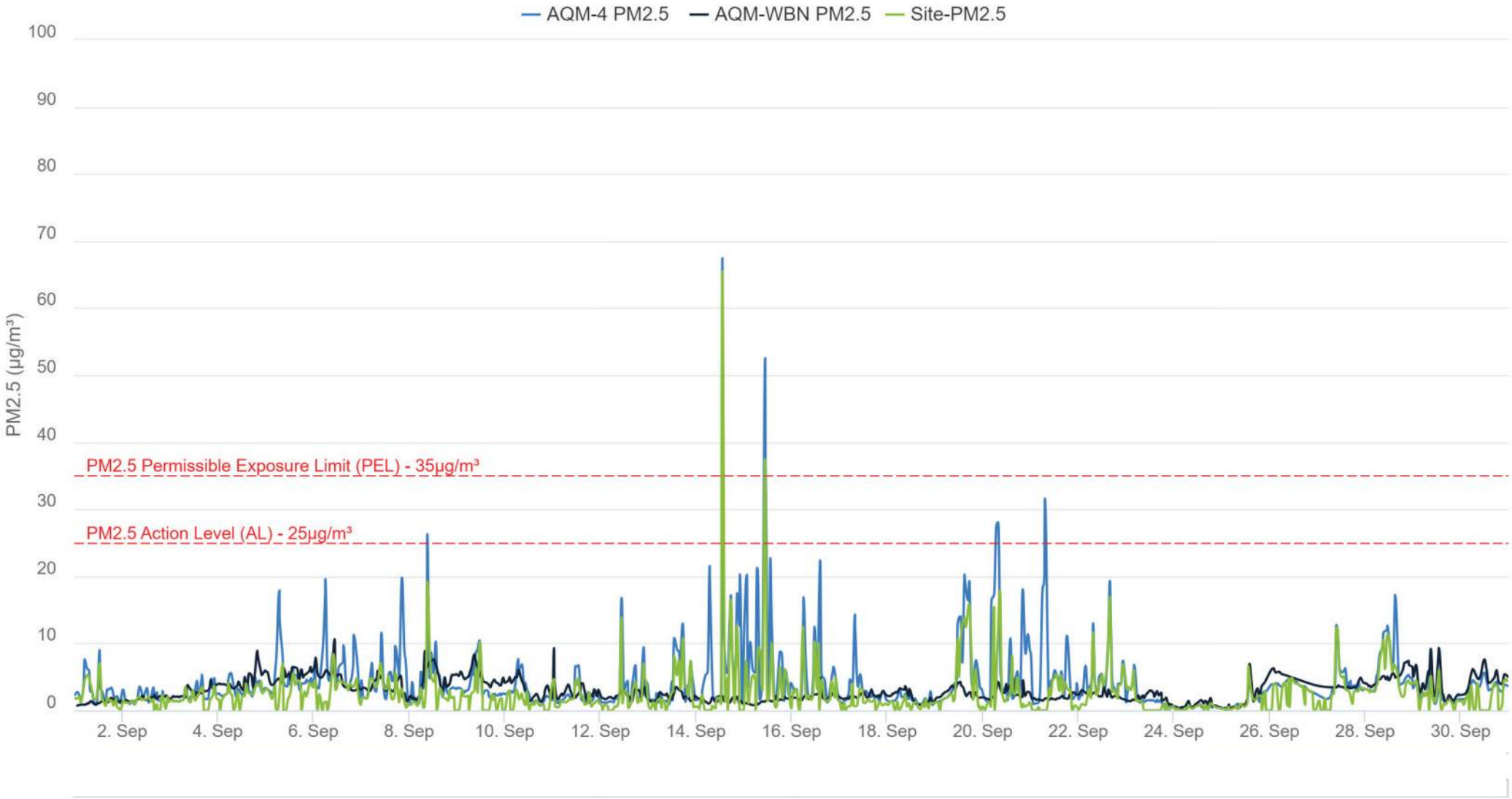


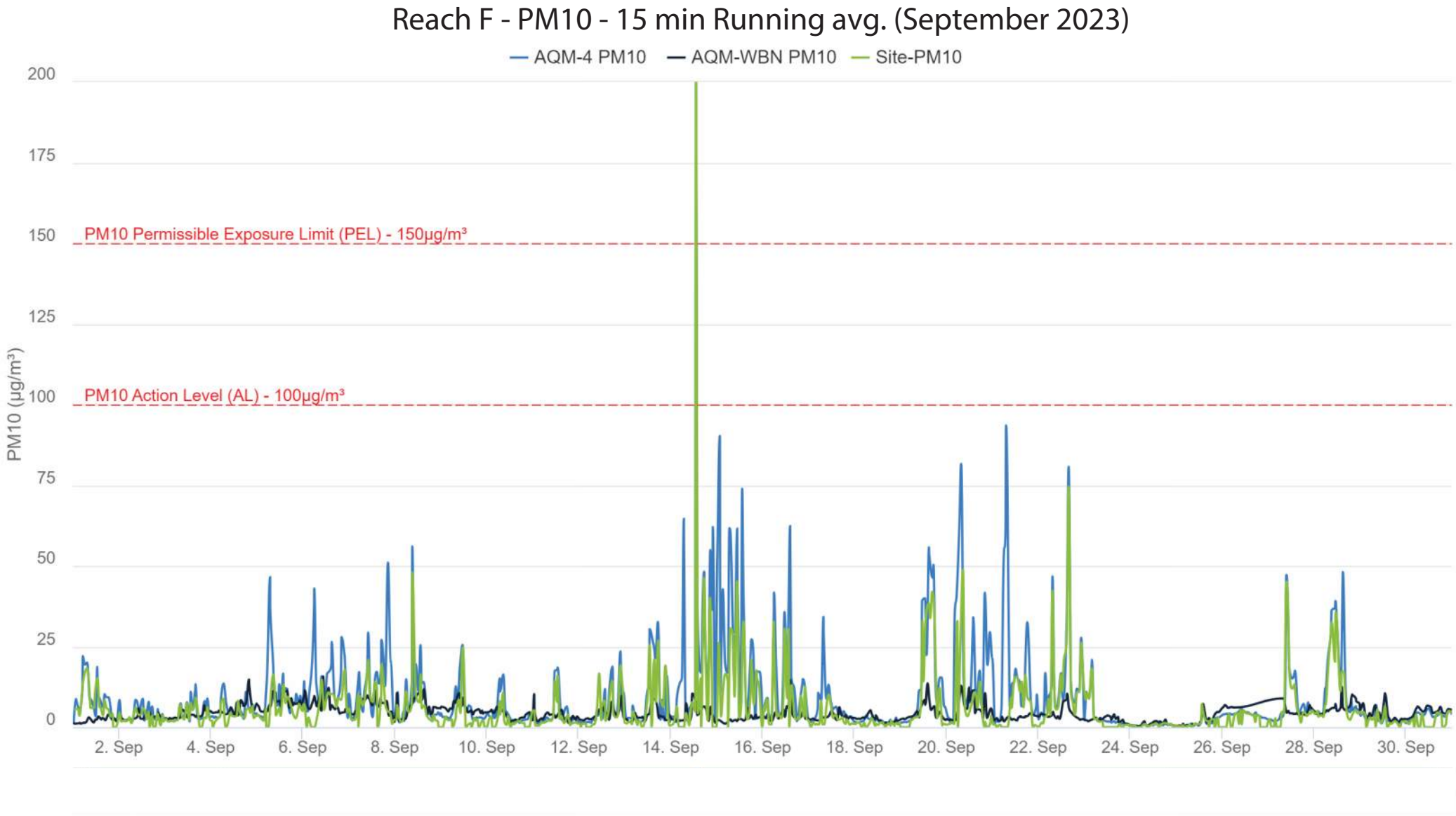

Reach C,D,& E - PM2.5 - 15 min Running Avg. (September 2023)
AQM-2 PM2.5
AQM-3 PM2.5
AQM-5 PM2.5
AQM-AT PM2.5
AQM-FB PM2.5
AQM-WB PM2.5
Site-PM2.5
PM2.5 (µg/m³)
100
90
80
70
60
50
40
30
20
10
0
PM2.5 Permissible Exposure Limit (PEL) - 35µg/m³
PM2.5 Action Level (AL) - 25µg/m³
2. Sep
4. Sep
6. Sep
8. Sep
10. Sep
12. Sep
14. Sep
16. Sep
18. Sep
20. Sep
22. Sep
24. Sep
26. Sep
28. Sep
30. Sep

Reach C,D,& E - PM10 - 15 min Running avg. (September 2023)

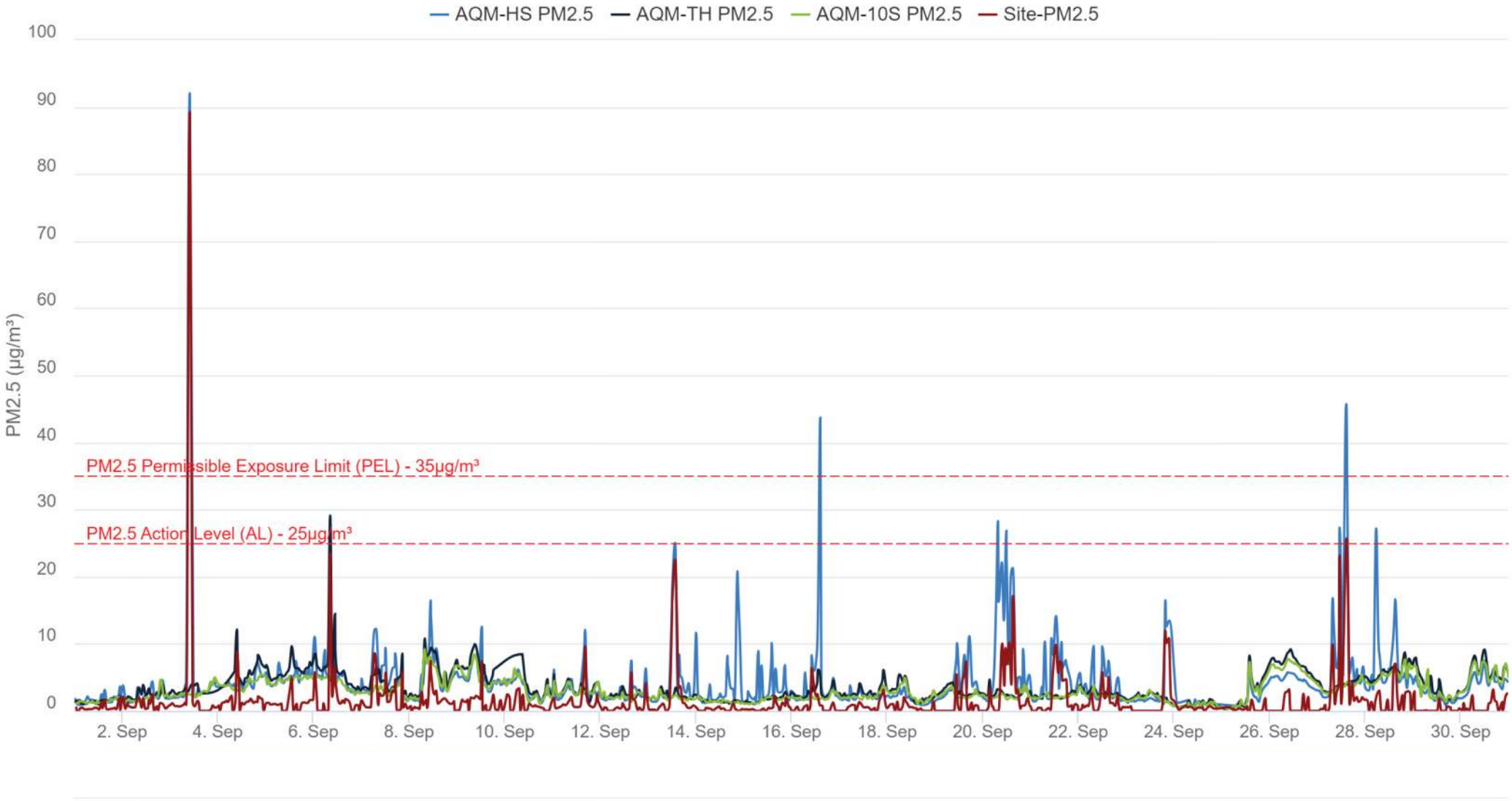


Reach F - PM2.5 - 15 min Running avg. (September 2023)

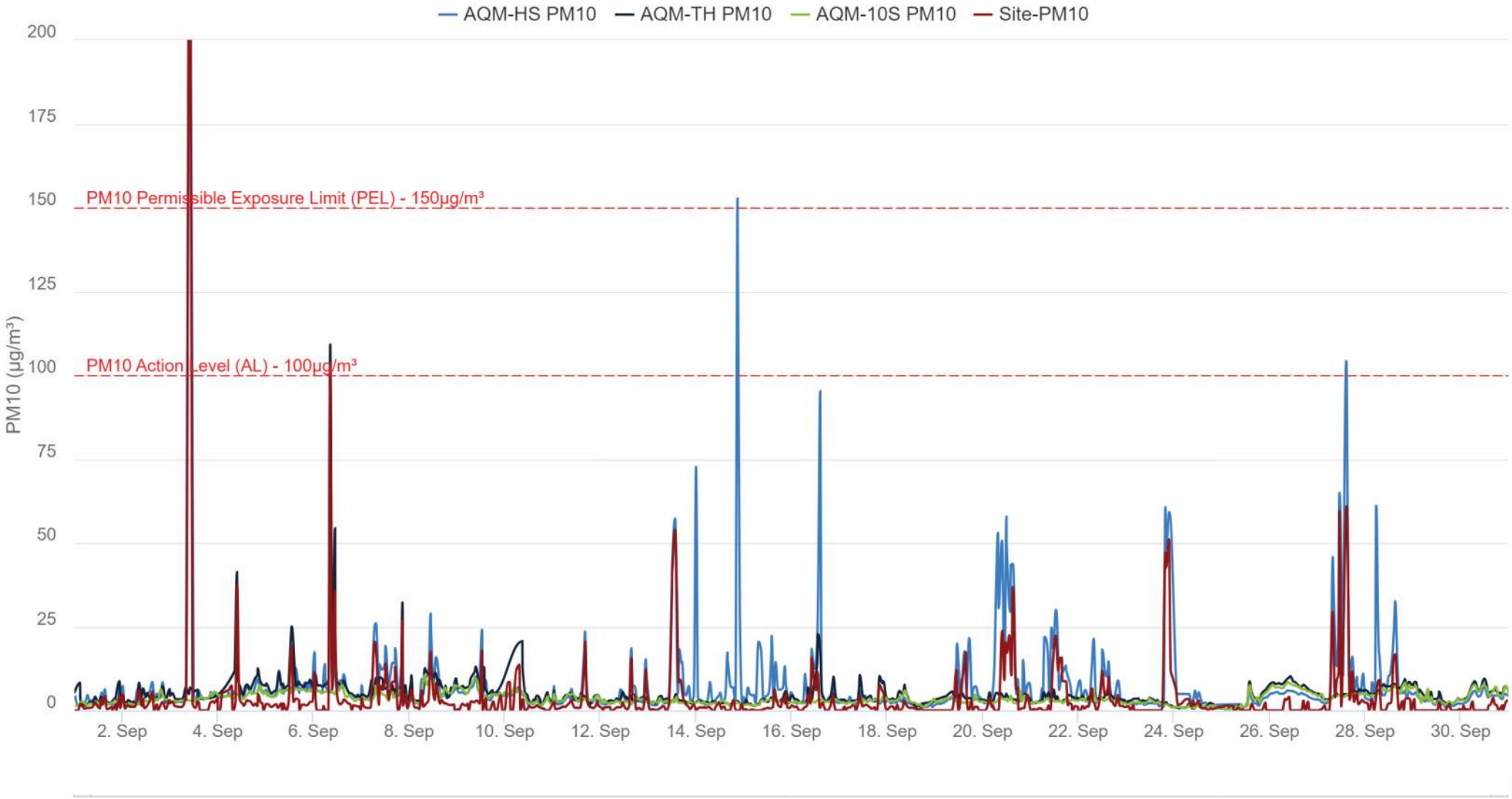



Reach F - PM10 - 15 min Running avg. (September 2023)
AQM-4 PM10
AQM-WBN PM10
Site-PM10
PM10 (µg/m³)
200
175
150
125
100
75
50
25
0
PM10 Permissible Exposure Limit (PEL) - 150µg/m³
PM10 Action Level (AL) - 100µg/m³
2. Sep
4. Sep
6. Sep
8. Sep
10. Sep
12. Sep
14. Sep
16. Sep
18. Sep
20. Sep
22. Sep
24. Sep
26. Sep
28. Sep
30. Sep

Reach G, H & I - PM2.5 - 15 min Running avg. (September 2023)



Reach G, H & I - PM10 - 15 min Running avg. (September 2023)



APPENDIX

I. ESCR Air Quality Management Program

Community health and safety is of utmost importance to the City of New York, the NYC Department of Design and Construction (DDC), and the East Side Coastal Resiliency Team. The ESCR Team is implementing a multi-level approach to Air Quality Management with includes:

- Step 1: Air Quality Management Plan
- Step 2: Daily Air Quality Mitigation Techniques
- Step 3: Daily Air Quality Monitoring
- Step 4: Air Quality oversight by environmental specialists

Step 1: The Air Quality Management Plan
The AQM Plan is submitted at the start of the project to outline the management of air quality for the project. It includes contractor roles and responsibilities, mitigation techniques, and action plans. This Plan is reviewed and approved by the Program Management / Construction Management (PMCM) Team HNTB-LiRo-Joint Venture, and the DDC.

Step 2: Daily Air Quality Mitigation Techniques
As mentioned in Chapter 6.6 of the EIS, Construction-Hazardous Materials Section "Dust management during soil-disturbing work would include the following: (1) use of water spray for roads, trucks, excavation areas and stockpiles; (2) use of anchored tarps to cover stockpiles; (3) use of truck covers during soil transport within site limits and during off-site transport; (4) employment of extra care during dry and/or high-wind periods; (5) use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface; and (6) use of a truck wheel wash at site access/egress points to prevent fugitive dust and off-site migration of dust and other particulates. The source(s) of any dust emissions would be identified and addressed immediately and appropriately.

Step 3: Daily Air Quality Monitoring
The air quality monitoring confirms the daily mitigation techniques in place are being implemented and are effective. Action levels are set to alert the contractor when a technique is not working, and adjustments are required to maintain the levels as set by the National Ambient Air Quality Standards (NAAQS) for PM pollution as mentioned above. Step 3 is implemented daily and mitigation techniques will vary depending on work activities. The EPA Standard Time Weighted Average (TWA) for analyzing PM levels is 24 hours, the ESCR project is analyzing levels more frequently at 15-minute TWA.

Step 4: Air Quality Oversight by Environmental Specialists
The oversight for environmental monitoring for the ESCR project is multi-tiered and includes relationships between several agencies and entities. As shown in the exhibit on the following page, a series of checks and balances have been implemented to assure compliance with environmental regulations. See *Fig. 4 East Side Coastal Resiliency Air Quality Monitoring Flow Chart*

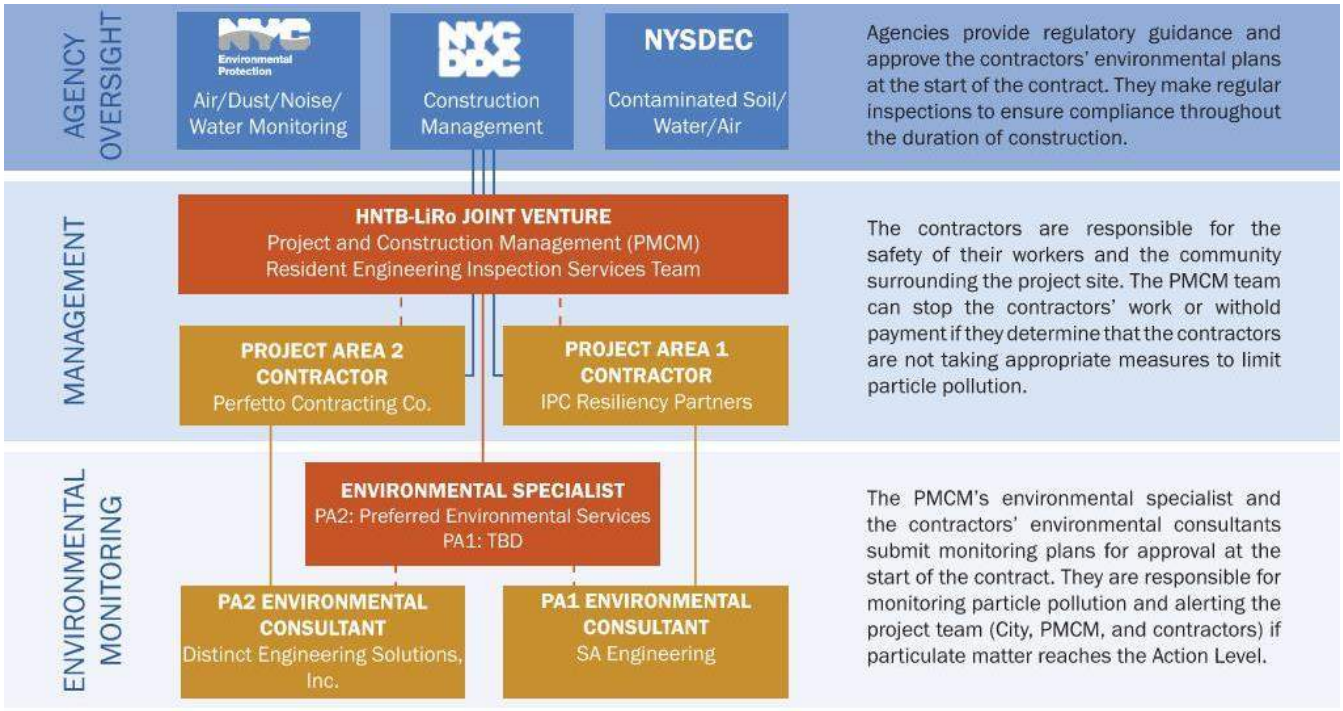


Fig.4 East Side Coastal Resiliency Air Quality Monitoring Flow Chart

II. RESOURCES

- ESCR Website: https://www1.nyc.gov/site/escr/index.page
- ESCR Environmental Review Process web page: https://www1.nyc.gov/site/escr/about/environmental-review.page
- FEIS Chapter 5.7 Hazardous Materials: https://www1.nyc.gov/assets/escr/downloads/pdf/FEIS/ESCR-EIS-Chapter-5.7-Hazardous-Materials.pdf
- FEIS Chapter 6.6 Construction Hazardous Materials: https://www1.nyc.gov/assets/escr/downloads/pdf/FEIS/ESCR-EIS-Chapter-6.6-Construction-Hazardous-Materials.pdf
- EPA Particulate Matter (PM) Pollution - Particulate Matter (PM) Basics: https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM
- EPA Particulate Matter (PM) Pollution - Setting and Reviewing Standards to Control Particulate Matter (PM) Pollution: https://www.epa.gov/pm-pollution/setting-and-reviewing-standards-control-particulate-matter-pm-pollution
- EPA Particulate Matter (PM) Pollution - National Ambient Air Quality Standards (NAAQS) for PM: https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm
- EPA Particulate Matter (PM) Pollution - Applying or Implementing Particulate Matter (PM) Standards: https://www.epa.gov/pm-pollution/applying-or-implementing-particulate-matter-pm-standards