EAST SIDE COASTAL RESILIENCY

SANDRESM1 | PROJECT AREA 1

AIR QUALITY MONITORING REPORT

Q4 | 2023

ISSUE DATE: APRIL 30, 2024
PERIOD COVERED: OCTOBER-DECEMBER 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).

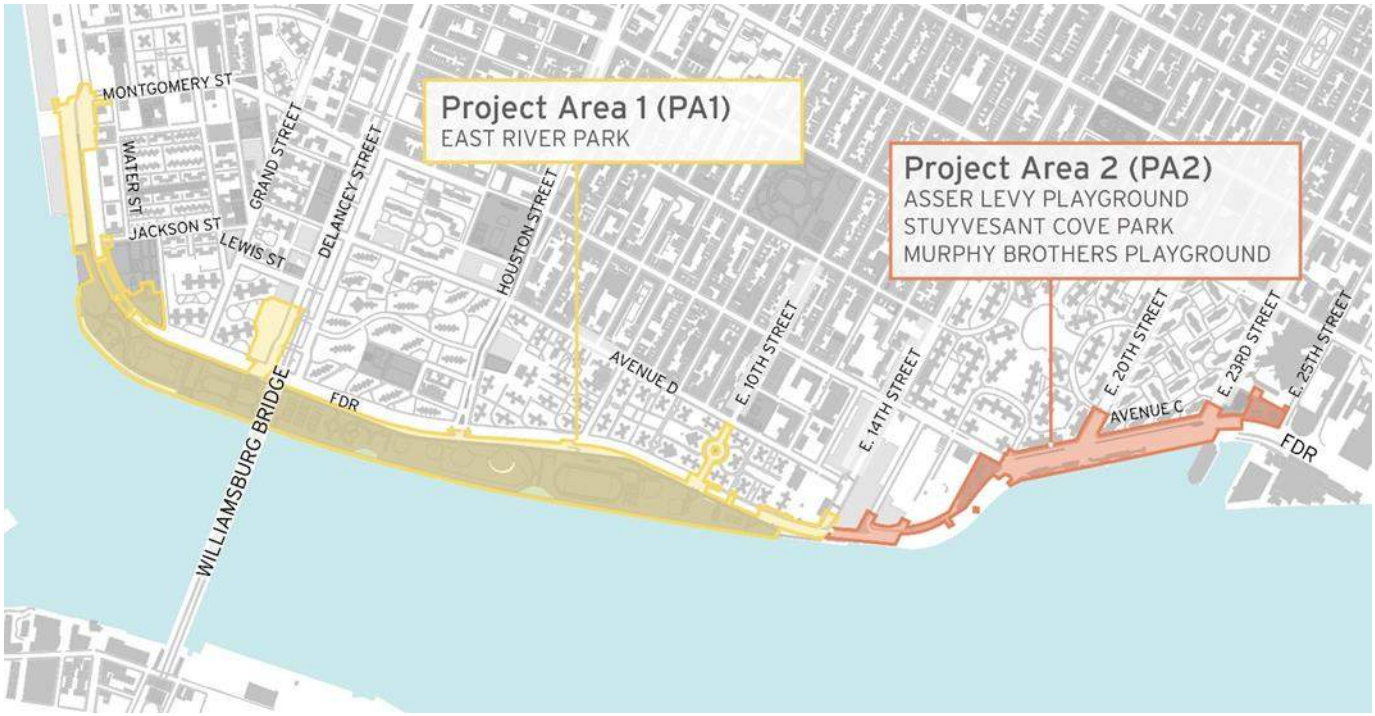


Fig.1 East Side Coastal Resiliency Project Areas

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.

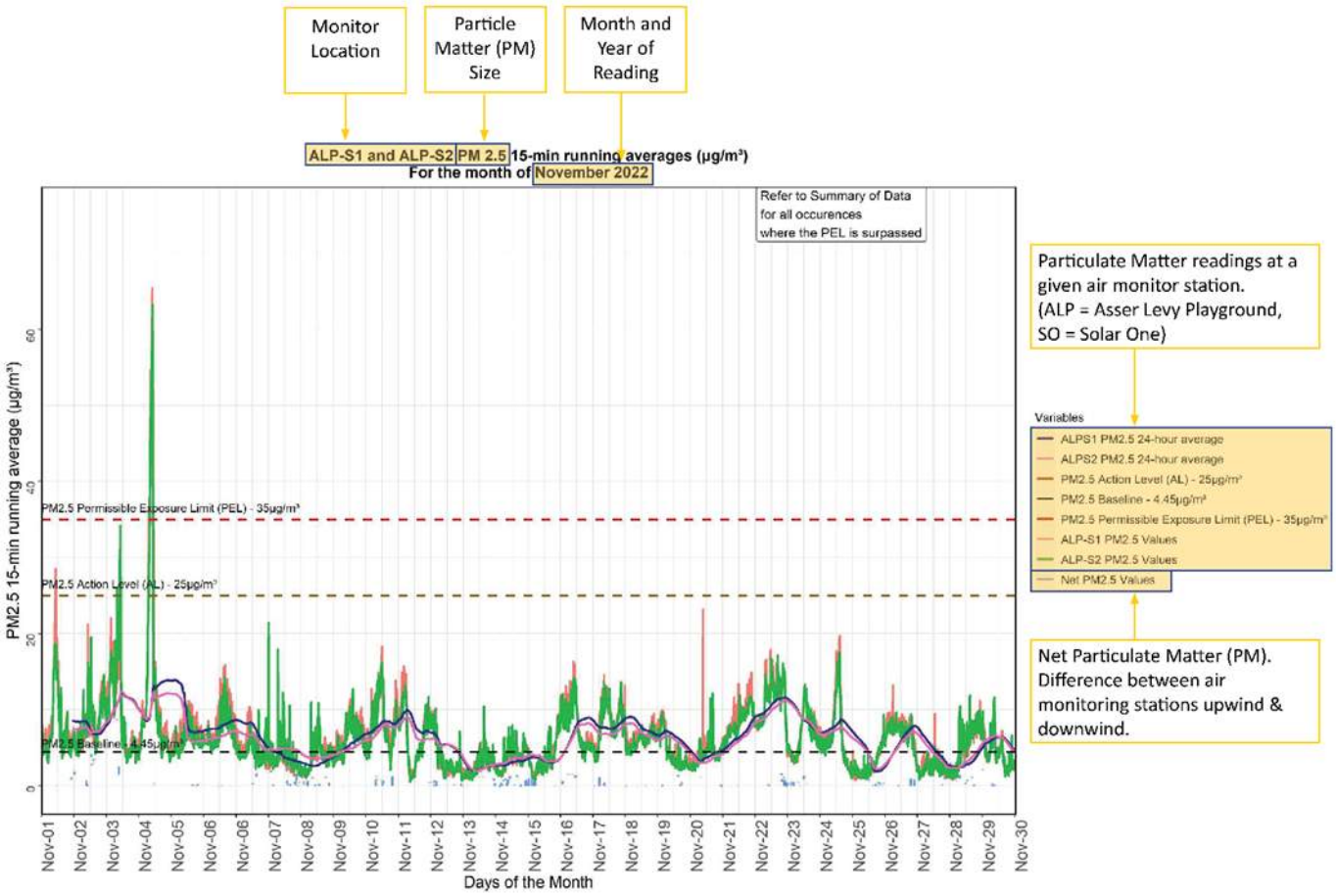


Fig.2 Sample Air Quality Data Plot

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) October through December 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

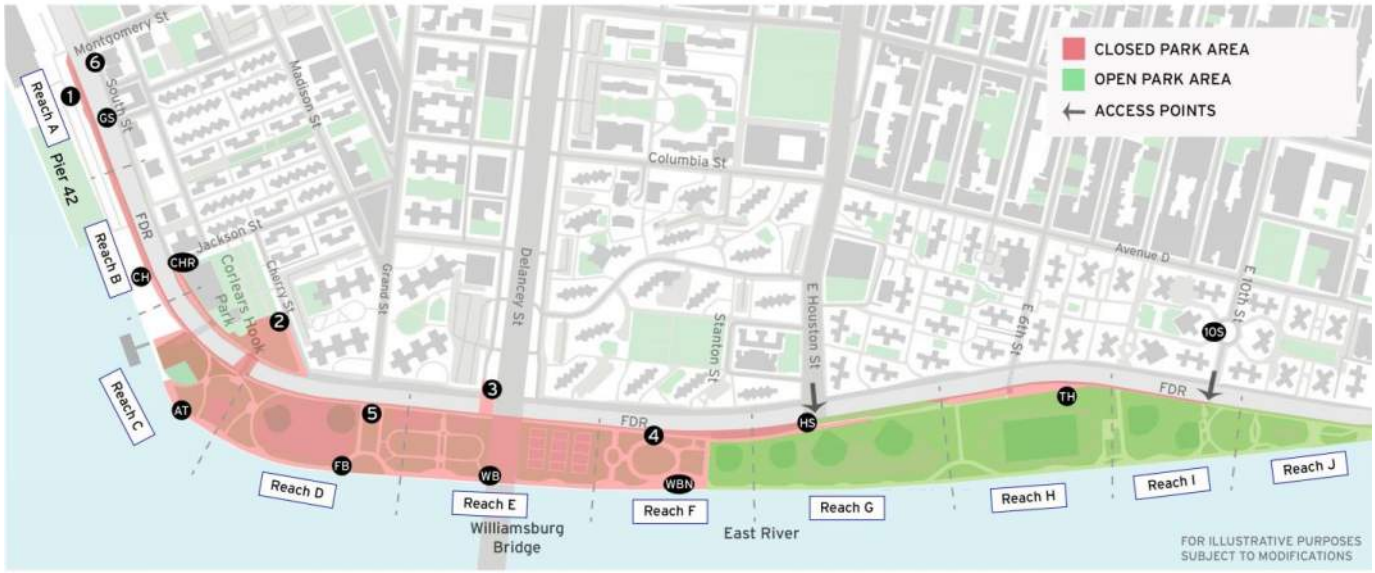


Fig.3B ESCR Project Area 1 Phase 1 Air Quality Monitoring Station Locations, as of March 24, 2023

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 October to December 2023:

Reach A:

- Pre-dig for floodwall sheets;
- Jet grout for floodwall sheets and monolith (7:00 AM – 3:30 PM; (Monday (M) – Friday (F) 11/1 - 11/10));
- Install floodwall sheets (7 AM - 3:30 PM, M – F 12/1 - 12/7); and
- Consolidated Edison (ConEd) utility work at Montgomery Street (7 AM - 3:30 PM, M - F 12/1 - 12/15).

Reach B:

- Shared path electrical work (7:00 AM – 3:30 PM, M – F 11/1 – 11/30).

Reach C: (7:00 AM – 3:30 PM; M-F and 3:00 PM - 11:00 PM; M - F)

- Excavate and backfill for electrical work at Corlears Hook Park;
- Jet grout at floodwall crossing;
- Form and pour proposed southern embayment wall and combi-wall south of proposed southern embayment;
- Pre-drill and drive amphitheater H-piles, deadmen sheets and install tie-rods;
- Form and pour Corlears West retaining wall;
- Prep pier caps for precast: scarify, form, pour, and drill holes for anchor-rods; and
- Place CA fill and install park drainage.

Reach D: (7:00 AM – 3:30 PM; M-F | 3:00 PM - 11:00 PM; M-F)

- Place fill materials;
- Dig for and place parks curb and athletic field stadium lighting foundations;
- Place drainage stone and turf for Fields 1 & 2;
- Prep pier caps for precast: scarify, form, pour, and drill holes for anchor-rods; and
- Install precast esplanade from proposed southern embayment to Fireboat House.

Reach E: (7:00 AM – 3:30 PM; M-F | 3:00 PM - 11:00 PM; M-F)

- Install cofferdam sheets and walers;
- Place fill materials;
- Drive combi-wall piles and pour pile plugs;
- Drill rock sockets under Williamsburg Bridge;
- Cutoff cap - form, pour, and strip (7 AM - 3:30 PM, M - F and 3 PM - 11 PM, M - F 12/1 - 12/15);
- Excavate, install SOE, and backfill for sewer work at Delancey Street bridge west retaining wall;
- Delancey Street bridge west retaining wall pier caps - form, pour, and strip; and
- Install precast esplanade from Fireboat House to Williamsburg Bridge.

Reach F: (7:00 AM – 3:30 PM; M-F and 3:00 PM - 11:00 PM; M - F)

- Drive combi-wall piles and pour pile plugs;
- Cofferdam work at NCM-057; and
- Cutoff cap - form, pour, and strip (7 AM - 3:30 PM, M - F all month and 3 PM - 11 PM, M - F 12/1 - 12/15).

Reach G:

- Set up new pedestrian traffic pattern on Houston St. ramp (7 AM - 3:30 PM; 10/11 - 10/13 & 9 PM - 5:30 AM; night of 10/13);
- Lead abatement for Houston St. pedestrian ramp demo (7 AM - 3:30 PM; 10/16 - 10/18);
- Demo Houston Street pedestrian ramp (CAT 316 Excavator) (3:30 PM - 12:00 AM; M - F 10/25 - 10/31);
- Remove existing Houston Street timber piles;
- Drill Houston Street ramp micro-piles (pile driving rig) (3pm - 11:30pm, M - F 11/1 - 11/16; 7am - 3:30pm 11/17);
- Close Fields 3, 4, and 5 to public starting 12/18/23; and
- Install H-piles and micro-piles for Houston St. retaining wall.

10th St.: (7:00 AM – 3:30 PM; M-F)

- Utility and sewer work.

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 October to December 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 additional 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 when PM levels surpasses both the AL as well as the PEL (15-minute TWA) to suppress construction activity effects on air quality in East River Park.

October 2023:

- PM2.5 levels surpassed the PEL (15-minute TWA) at AQM-CH on October 19th; AQM-AT on October 25th; AQM-FB on October 2nd; AQM-5 on October 25th; AQM-4 on October 11th; AQM-WBN on October 3rd; AQM-HS on October 3rd, October 4th, October 5th, October 6th, October 10th, October 11th, October 12th, October 13th, October 18th, and October 19th; and AQM-TH on October 25th.

- PM10 levels surpassed the PEL (15-minute TWA) at AQM-CH on October 19th; AQM-CHR on October 19th; AQM-AT on October 25th; AQM-FB on October 25th; AQM-5 on October 14th and October 25th; AQM-WB on October 19th; AQM-4 on October 11th; and AQM-HS on October 12th.

November 2023:

- PM2.5 levels surpassed the PEL (15-minute TWA) at AQM-1 on November 5th; AQM-CH on November 17th; AQM-CHR on November 5th and November 9th; AQM-FB on November 15th, November 16th, November 17th, November 22nd, November 27th, and November 28th; AQM-3 on November 1st, November 8th, November 14th, and November 30th; and AQM-4 on November 4th.

- PM10 levels surpassed the PEL (15-minute TWA) at AQM-3 on November 1st, November 8th, November 14th, and November 30th; AQM-FB on November 5th, November 16th, November 27th, and November 28th; and AQM-4 on November 4th.

December 2023:

- PM2.5 levels surpassed the PEL (15-minute TWA) at AQM-1 on December 15th; AQM-CH on December 8th; AQM-CHR on December 16th and December 22nd; AQM-FB on December 9th; AQM-WB on December 2nd, December 9th, and December 26th; AQM-3 on December 16th; AQM-4 on December 1st and December 22nd; and AQM-HS on December 1st and December 26th.

- PM10 levels surpassed the PEL (15-minute TWA) at AQM-1 on December 15th; AQM-CHR on December 22nd; and AQM-3 on December 16th and December 22nd.

Baselines:

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

PART 2

Summary of Data October 2023

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

- AQM-CHR on 10/19 for 12 minutes;
- AQM-AT on 10/25 for 70 minutes;
- AQM-FB on 10/2 for 18 minutes;
- AQM-5 on 10/25 for 3 minutes;
- AQM-4 on 10/11 for 17 minutes;
- AQM-WBN on 10/3 for 20 minutes;
- AQM-HS on 10/3 for 17 minutes, 10/4 for 14 minutes, 10/5 for 51 minutes and 14 minutes, 10/6 for 15 minutes, 10/10 for 27 minutes, 10/11 for 60 minutes, 10/12 for 44 minutes, 10/13 for 14 minutes, 10/18 for 12 minutes, and 10/19 for 62 minutes; and
- AQM-TH on 10/25 for 16 minutes.

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

- AQM-CH on 10/19 for 3 minutes;
- AQM-CHR on 10/19 for 15 minutes;
- AQM-AT on 10/25 for 62 minutes;
- AQM-FB on 10/25 for 29 minutes;
- AQM-5 on 10/14 and 10/25 for 2 minutes;
- AQM-WB on 10/19 for 3 minutes;
- AQM-4 on 10/11 for 16 minutes; and
- AQM-HS on 10/12 for 16 minutes.

For the month of October 2023, PM net 2.5 levels were surpassed on 10/3, 10/4, 10/5, 10/10, 10/11, 10/12, 10/13, 10/18, 10/19, and 10/25. PM net 10 were exceeded on 10/4, 10/11, 10/12, 10/13, 10/14, 10/16, 10/17, 10/19, and 10/25.

For the month of October 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 17 occasions (10/2, 10/3, 10/4, 10/5, 10/6, 10/10, 10/11, 10/12, 10/13, 10/19, and 10/25) for between 3 and 70 minutes.
    - AQM-CHR is located on the construction access road/shared use path in Reach B; elevated readings on 10/19 were related to anomalous readings during instrument calibration.
    - AQM-FB is located in the vicinity of the Fire Boat House; elevated readings on 10/2 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; elevated readings on 10/25 were related to onsite 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 10/25 were related to onsite construction activities. A water truck was deployed to mitigate airborne dust.
    - AQM-4 is located adjacent to the shared use path/construction access road; elevated readings on 10/19 were related to anomalous readings during instrument calibration.

- AQM-WBN is north of the Williamsburg Bridge; the elevated reading on 10/3 was related to onsite construction activities. A hose 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 10/3 were related to unknown offsite activities.
  - The elevated readings on 10/4, 10/5, 10/6, 10/10, 10/11, 10/18, and 10/19 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
  - The elevated readings on 10/12 and 10/13 were related to onsite construction activities. A water truck was deployed to mitigate airborne dust.
- AQM-TH is located near the Track House in the vicinity of the shared use path and open sections of East River Park; the elevated readings on 10/25 were related to unknown offsite activities.

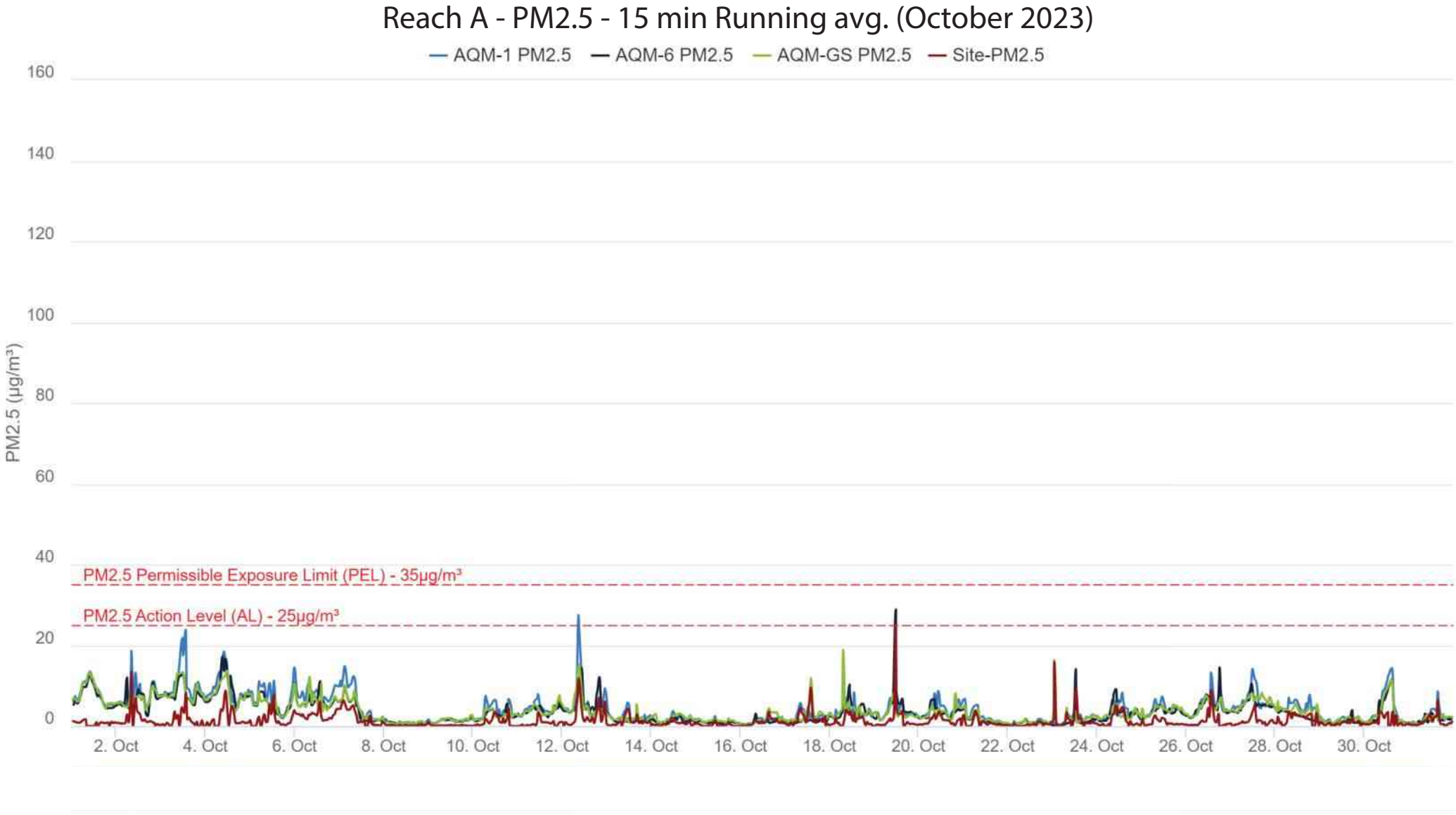
PM 10 µg/m^3

- PM 10 µg/m^3 levels surpassed the PEL (15-minute TWA) 9 occasions (10/11, 10/12, 10/14, 10/19, and 10/25) for between 2 and 62 minutes.
  - AQM-CH is located on Jackson Street adjacent to the FDR; elevated readings on 10/19 were related to anomalous readings during instrument calibration.
  - AQM-CHR is located on the construction access road/shared use path in Reach B; elevated readings on 10/19 were related to anomalous readings during instrument calibration.
  - AQM-AT is located near the former amphitheater and Corlears Hook pedestrian bridge; elevated readings on 10/25 were related to onsite construction activities. A water truck was deployed to mitigate airborne dust.
  - AQM-FB is located in the vicinity of the Fire Boat House; elevated readings on 10/25 were related to onsite 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 10/14 and 10/25 were related to onsite construction vehicle traffic. 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 10/11 were related to anomalous readings during instrument calibration.
  - AQM-WB is in the vicinity of the Williamsburg Bridge along the East River; elevated readings on 10/19 were related to anomalous readings during instrument calibration.
  - AQM-HS is located near the Houston Street ramp at the exit to the construction on the FDR; elevated readings on 10/12 were related to onsite construction activities. A water truck was deployed to mitigate airborne dust.

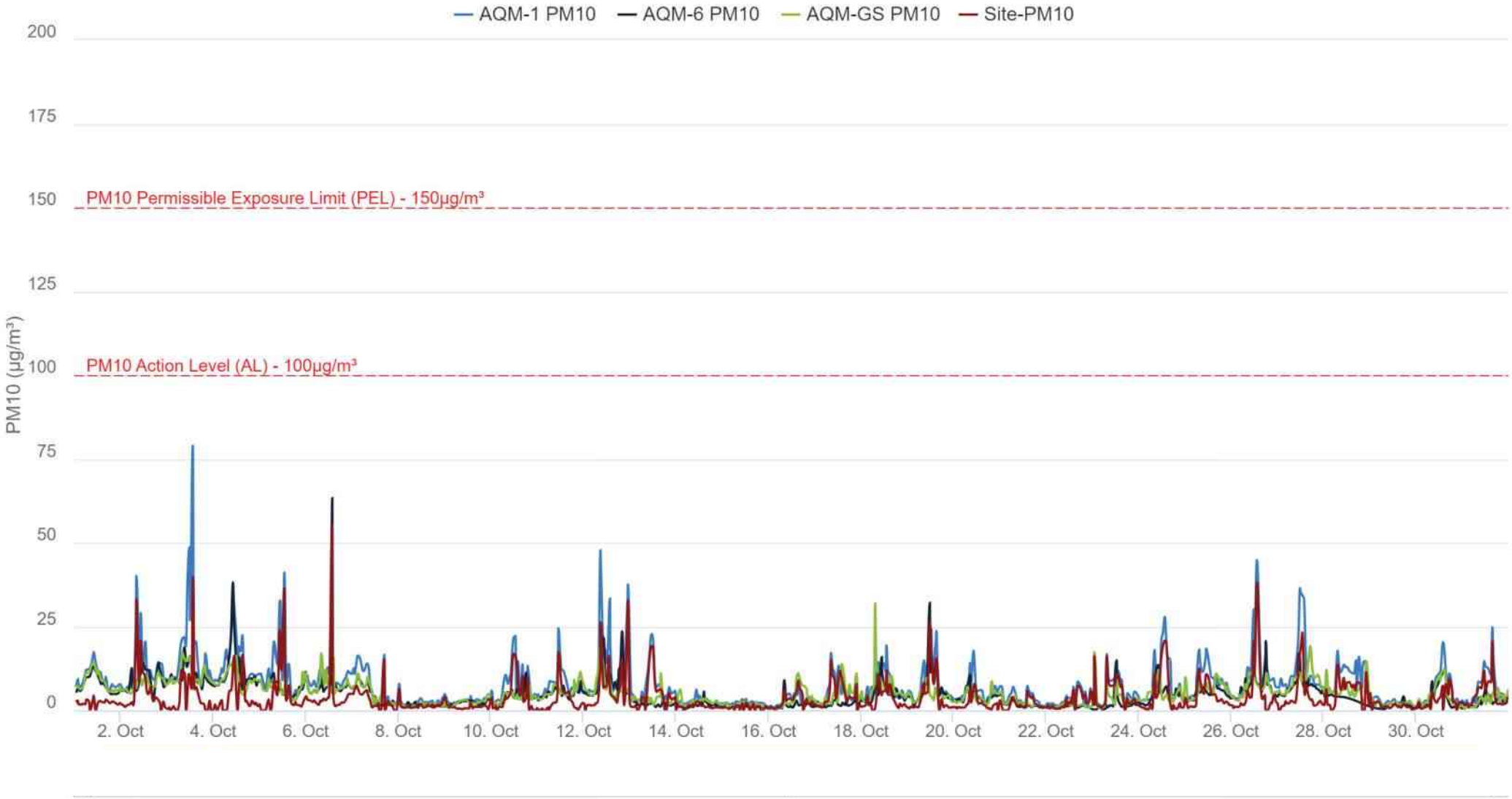
Mitigation Measures

- 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.

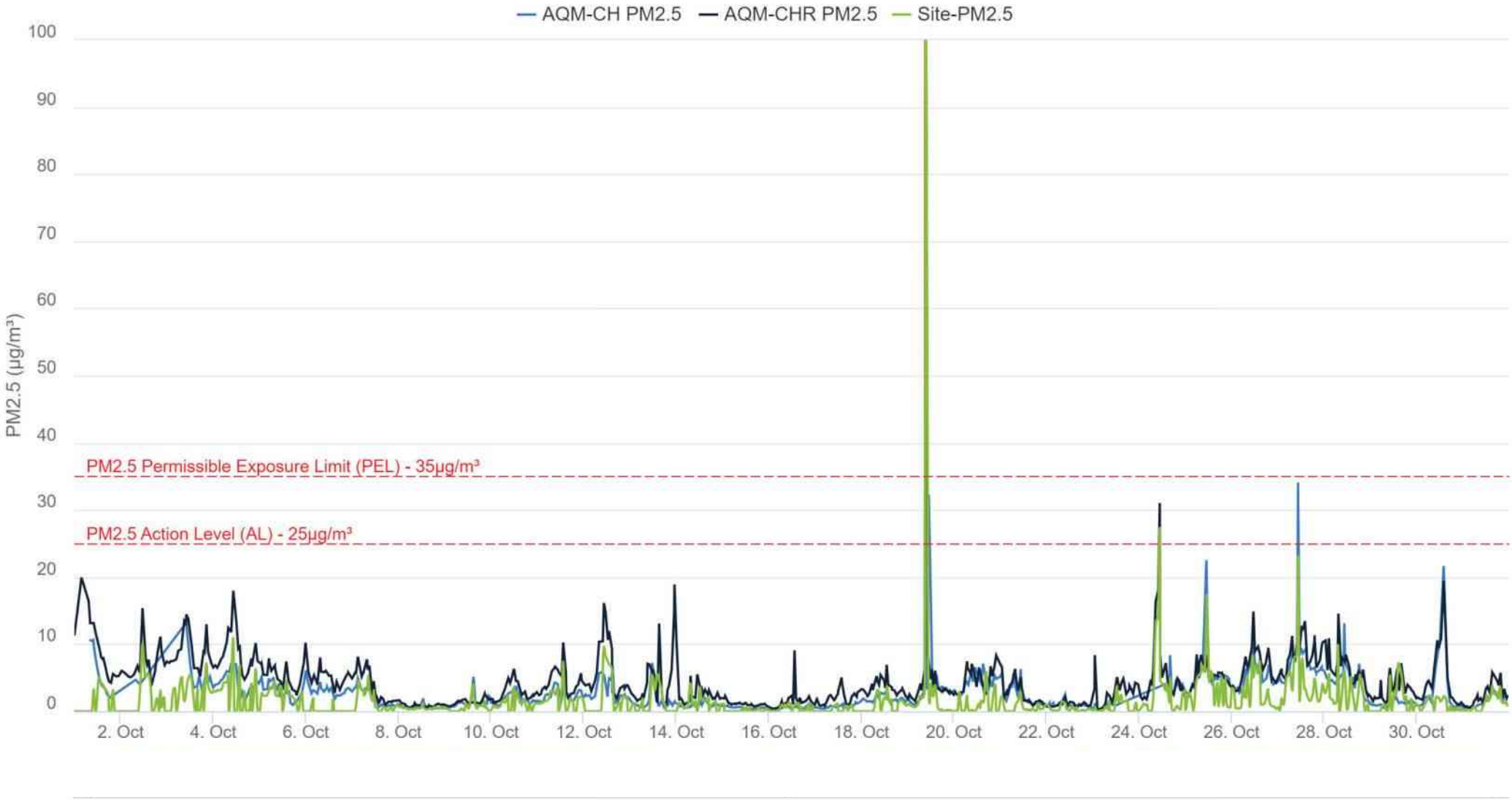
OCTOBER 2023 DATA PLOTS


Reach A - PM2.5 - 15 min Running avg. (October 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. Oct
4. Oct
6. Oct
8. Oct
10. Oct
12. Oct
14. Oct
16. Oct
18. Oct
20. Oct
22. Oct
24. Oct
26. Oct
28. Oct
30. Oct

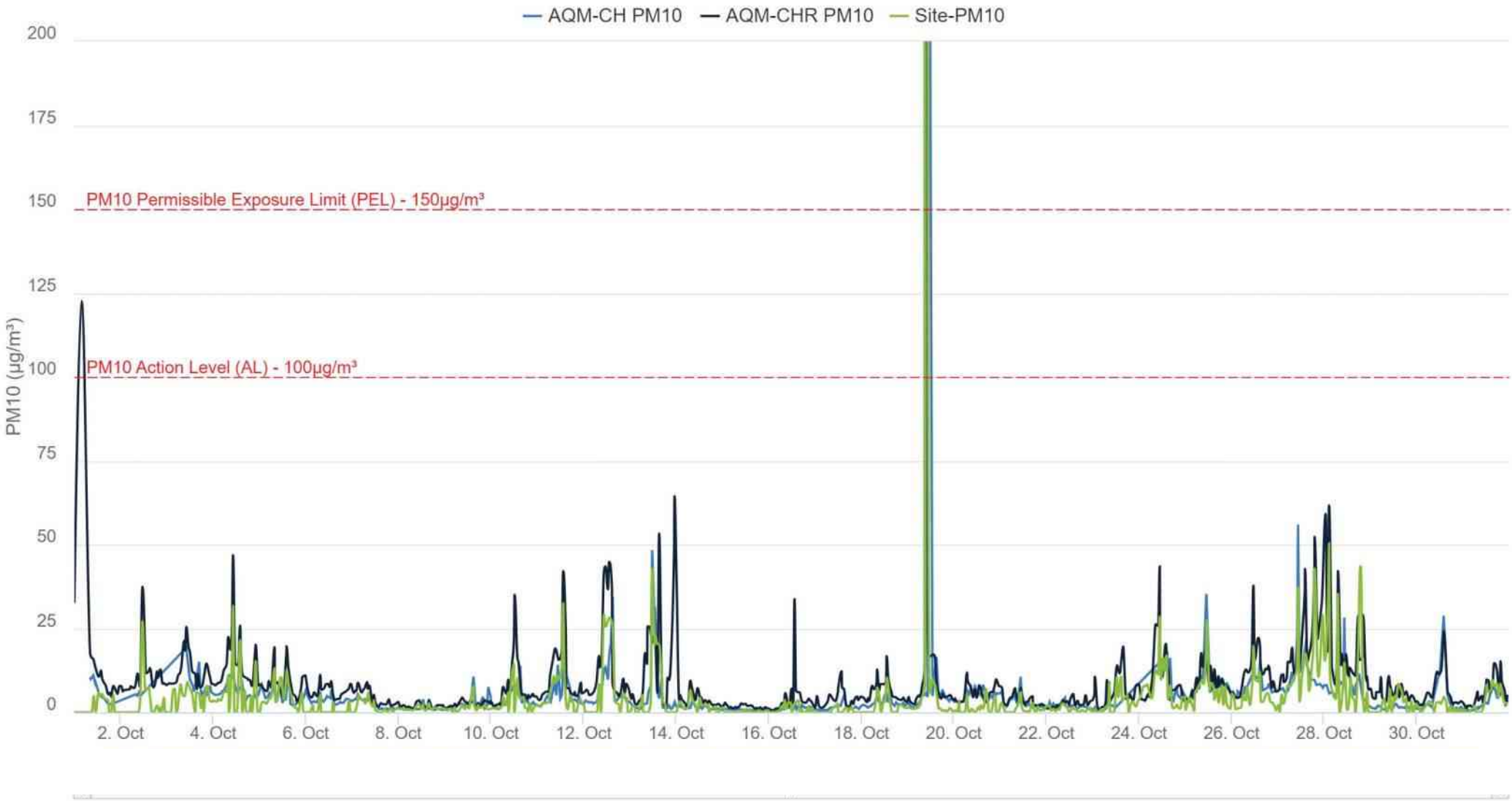
Reach A - PM10 - 15 min Running Avg. (October 2023)



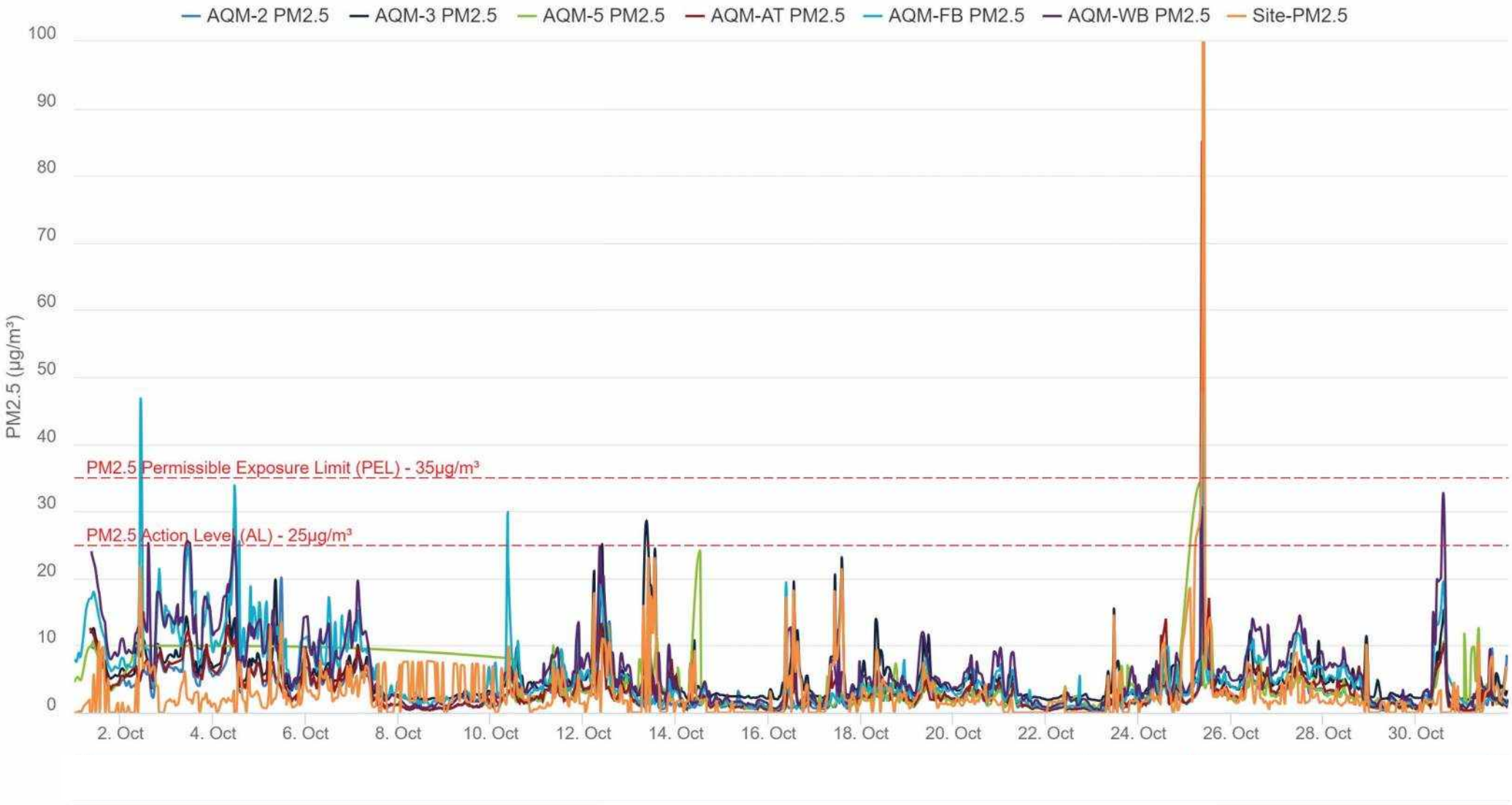
Reach B - PM2.5 - 15 min Running Avg. (October 2023)



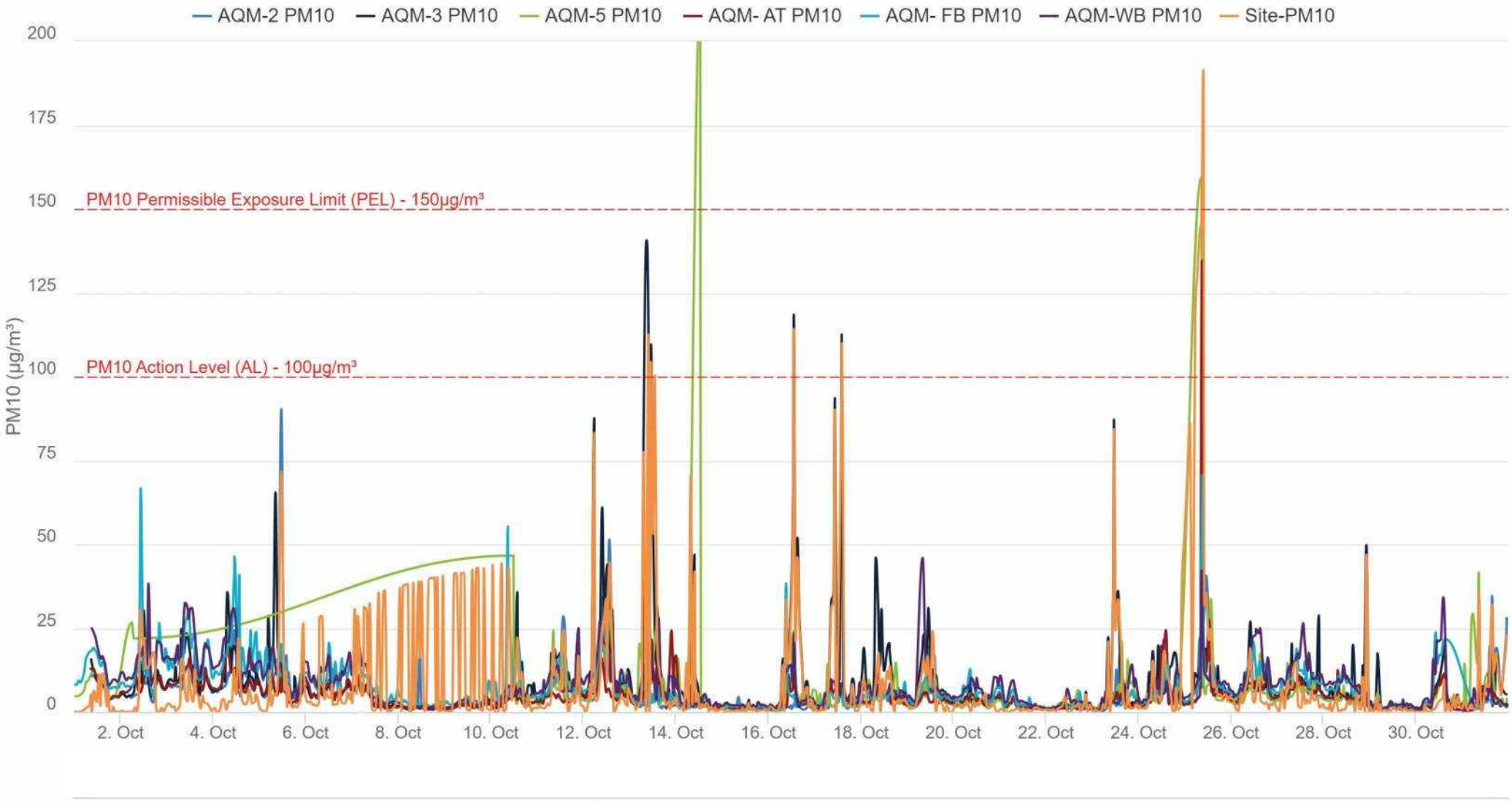
Reach B - PM10 - 15 min Running avg. (October 2023)



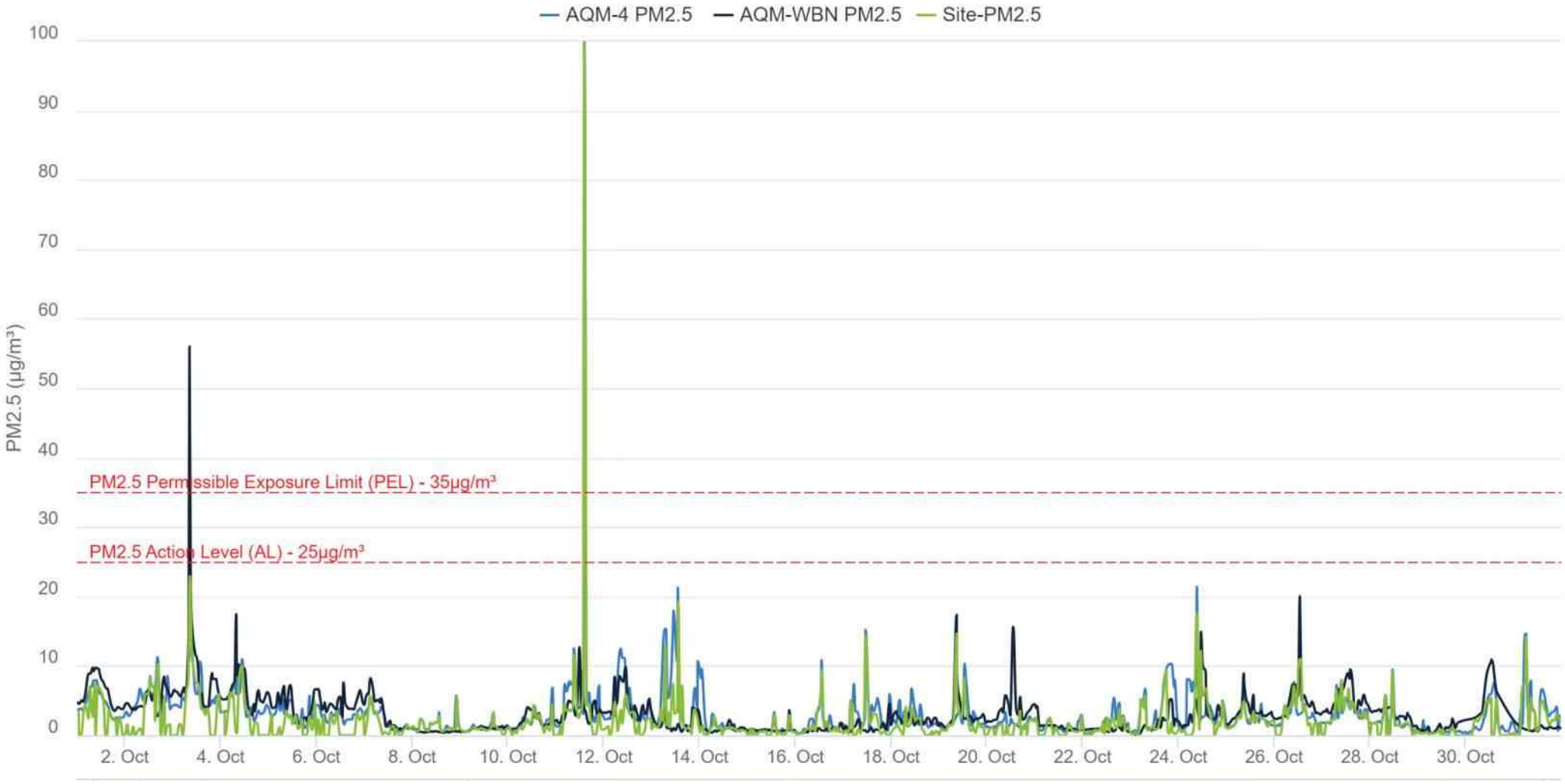
Reach C,D,& E - PM2.5 - 15 min Running Avg. (October 2023)



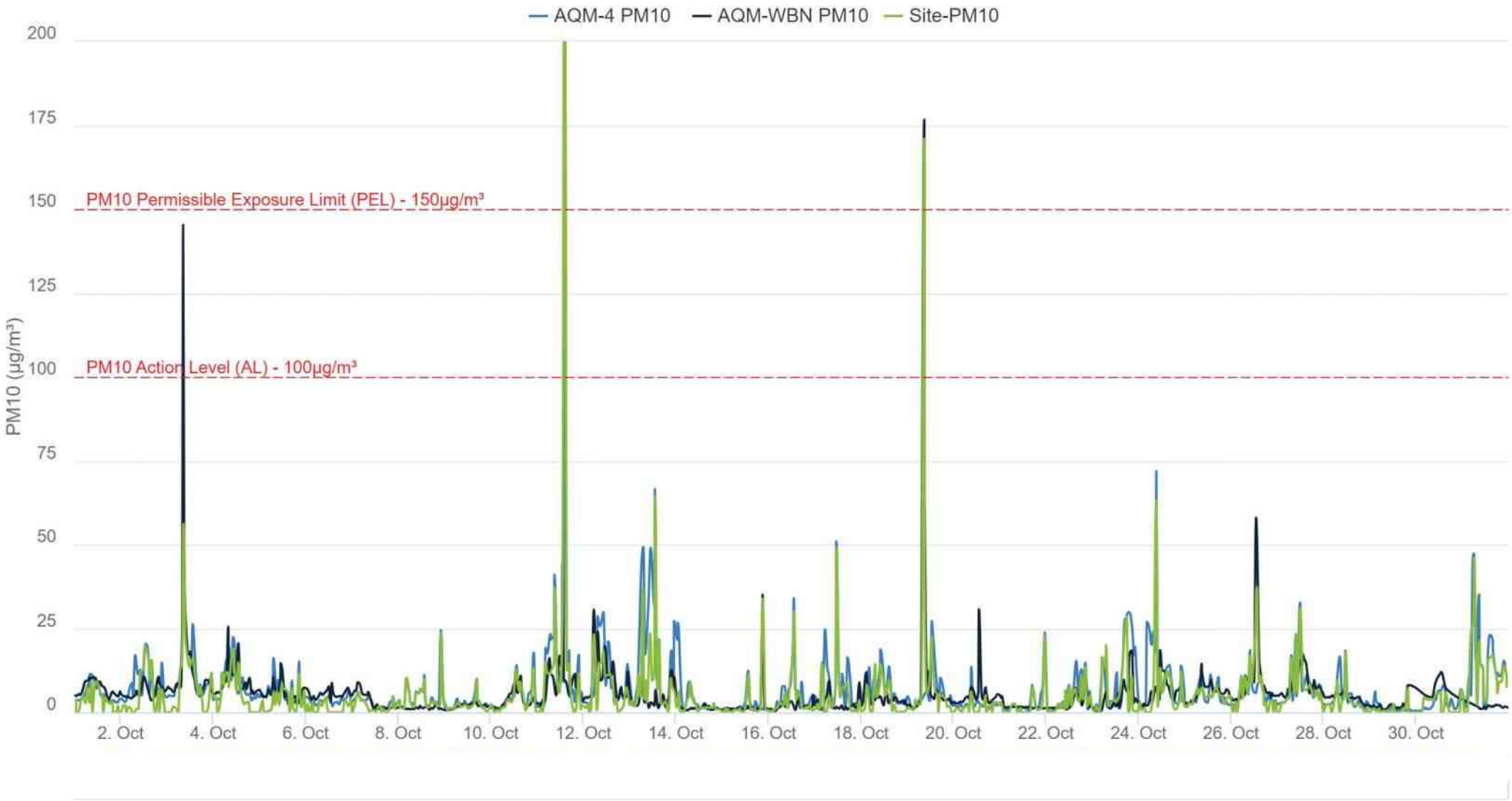
Reach C,D,& E - PM10 - 15 min Running avg. (October 2023)

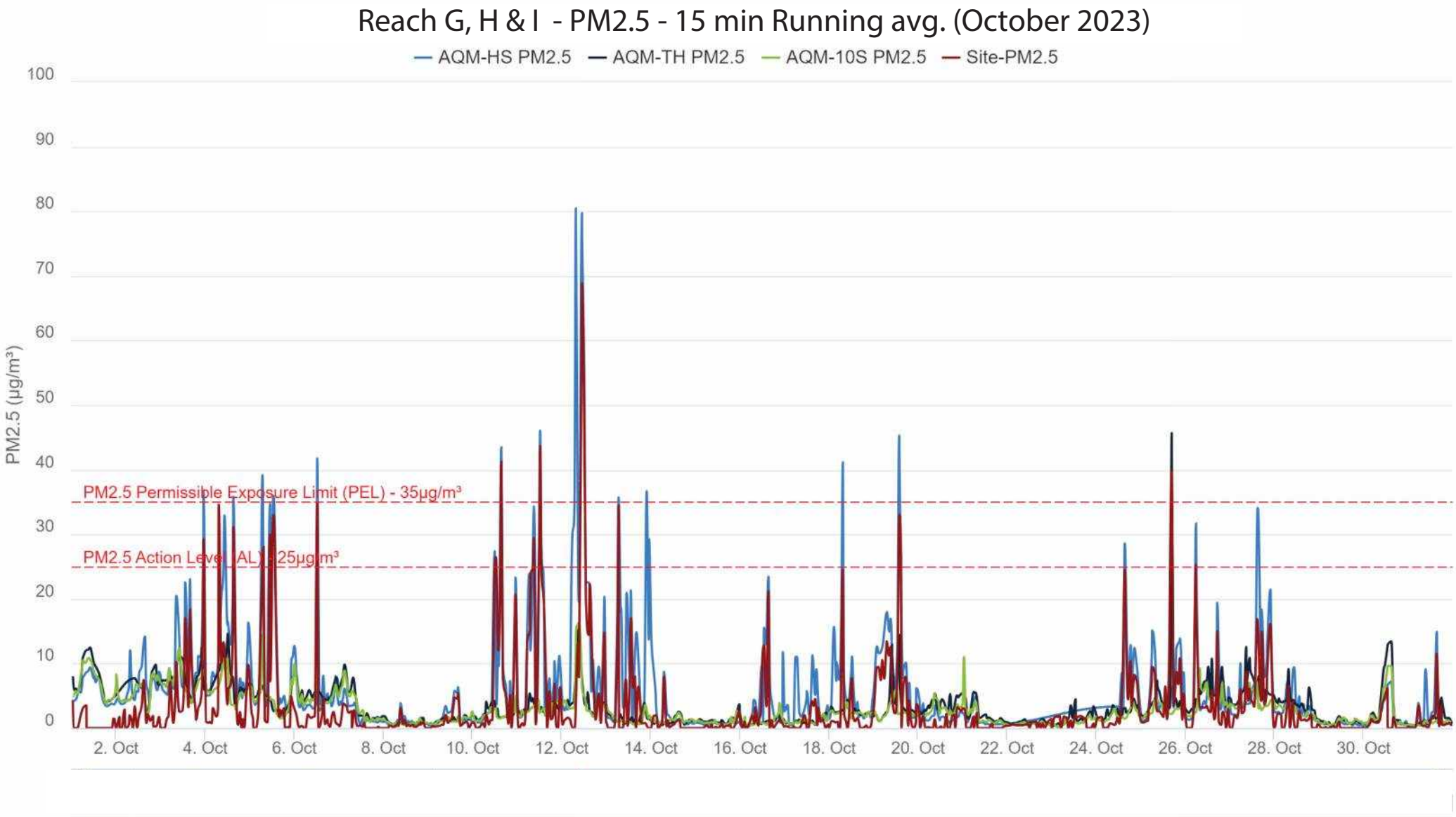


Reach F - PM2.5 - 15 min Running avg. (October 2023)



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




Reach G, H & I - PM2.5 - 15 min Running avg. (October 2023)
AQM-HS PM2.5
AQM-TH PM2.5
AQM-10S 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. Oct
4. Oct
6. Oct
8. Oct
10. Oct
12. Oct
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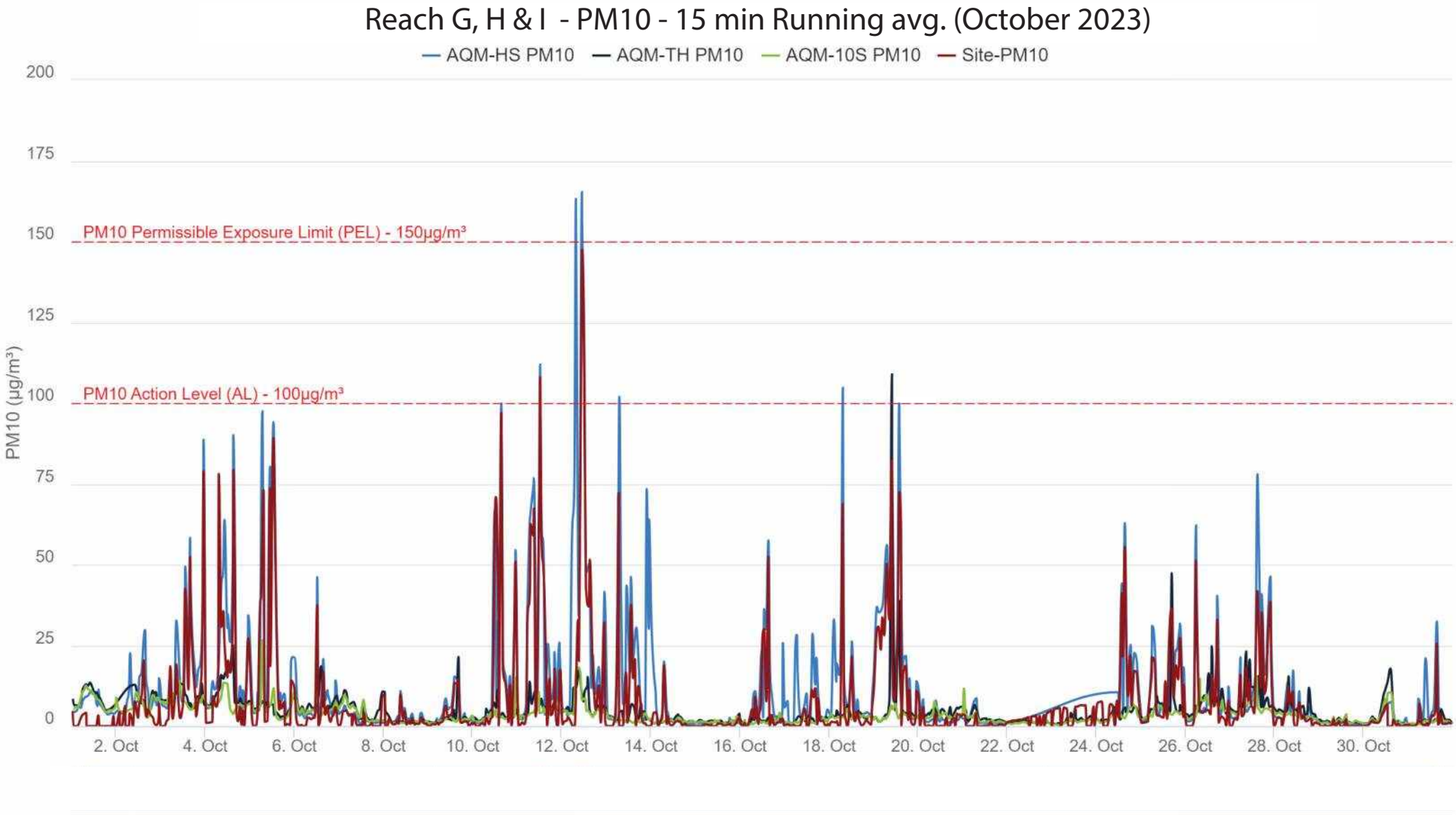
16. Oct
18. Oct
20. Oct
22. Oct
24. Oct
26. Oct
28. Oct
30. Oct


Reach G, H & I - PM10 - 15 min Running avg. (October 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)
200
175
150
125
100
75
50
25
0
2. Oct
4. Oct
6. Oct
8. Oct
10. Oct
12. Oct
14. Oct
16. Oct
18. Oct
20. Oct
22. Oct
24. Oct
26. Oct
28. Oct
30. Oct

Summary of Data November 2023

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

- AQM-1 on 11/5 for 16 minutes;
- AQM-CH on 11/17 for 15 minutes;
- AQM-CHR on 11/5 for 20 minutes and 11/9 for 19 minutes;
- AQM-FB on 11/15 for 146 minutes, 11/16 for 29 and 151 minutes, 11/17 for 15 and 58 minutes. 11/22 for 39 minutes, 11/27 for 126 minutes, and 11/28 for 120 minutes;
- AQM-3 on 11/1 for 21 minutes, 11/8 for 17 minutes, 11/14 for 15 and 17 minutes, and 11/30 for 18 minutes; and
- AQM-4 on 11/4 for 35 minutes.

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

- AQM-3 on 11/1 for 29 minutes, 11/8 for 21 minutes, 11/14 for 16 and 18 minutes, and 11/30 for 18 minutes;
- AQM-FB on 11/5 for 25 minutes, 11/16 for 21 and 93 minutes, 11/27 for 69 minutes, and 11/28 for 36 minutes; and
- AQM-4 on 11/4 for 34 minutes.

For the month of November 2023, PM net 2.5 levels were exceeded on 11/1, 11/2, 11/4, 11/8, 11/14, 11/15, 11/16, 11/17, 11/21, 11/28, and 11/30. PM net 10 levels were exceeded on 11/1, 11/2, 11/4, 11/8, 11/14, 11/15, 11/16, 1/28, and 11/30.

For the month of November 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 18 occasions (11/1, 11/4, 11/5, 11/8, 11/9, 11/14, 11/15, 11/16, 11/17, 11/22, 11/27, 11/28, and 11/30) for between 15 and 151 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 11/5 were related to unknown offsite activities.
    - AQM-CH is located on Jackson Street adjacent to the FDR; elevated readings on 11/17 were related to offsite construction activity under a different contract.
    - AQM-CHR is located on the construction access road/shared use path in Reach B.
        - Elevated readings on 11/5 were related to unknown offsite activities.
        - Elevated readings on 11/9 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.
        - Elevated readings on 11/15, 11/16, 11/22, 11/27, and 11/28 were related to offsite construction activity under a different contract.
        - Elevated readings on 11/17 were related to onsite construction activity. A water truck was deployed to mitigate airborne dust.
    - AQM-3 is located is located west of the FDR on Delancey Street.
        - Elevated readings on 11/1 and 11/30 were related to offsite construction activity under a different contract.

        - Elevated readings on 11/8 and 11/14 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; elevated readings on 11/4 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.

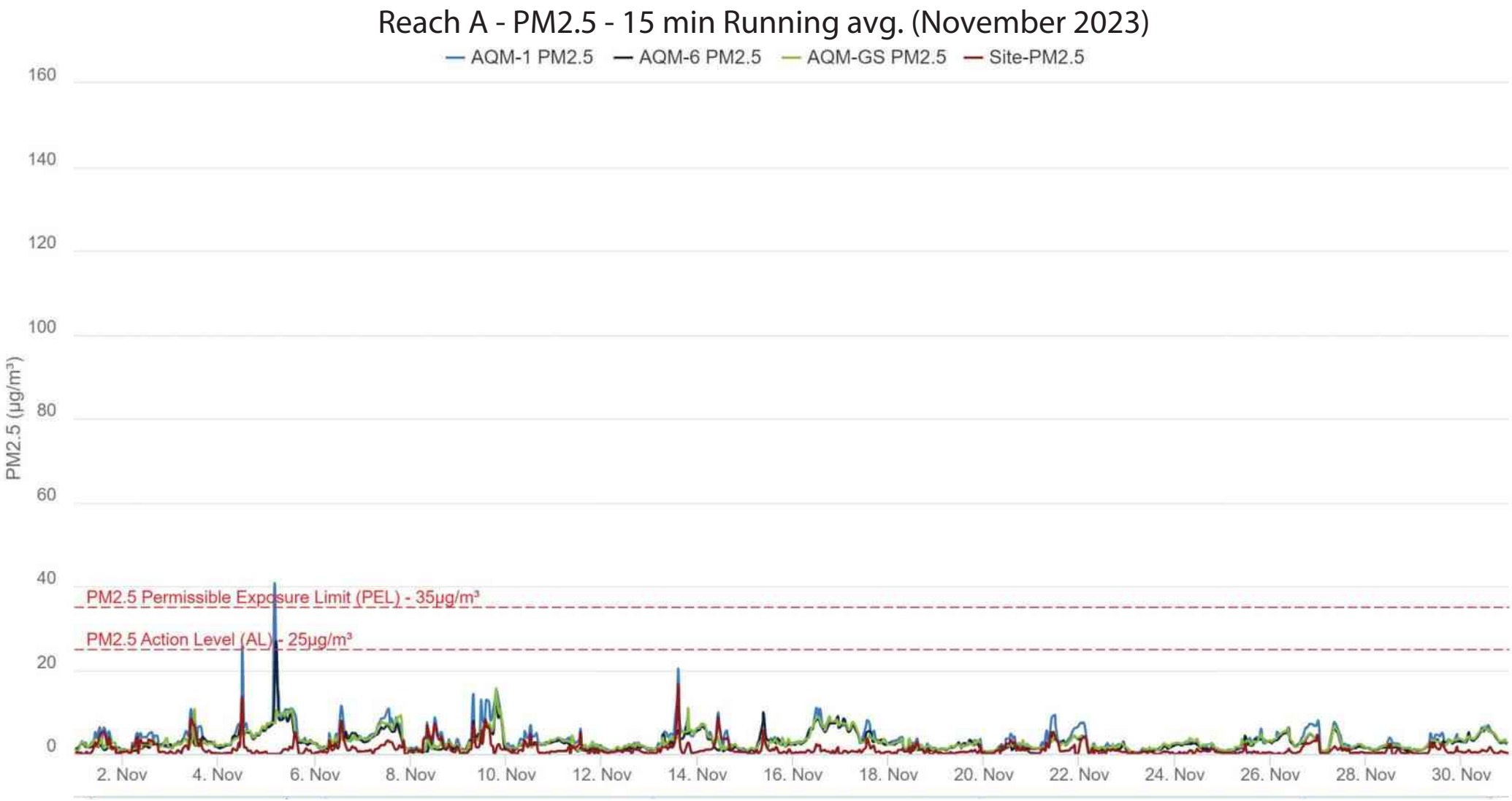
PM 10 µg/m^3

- PM 10 µg/m^3 levels surpassed the PEL on 11 occasions (11/1, 11/4, 11/8, 11/14, 11/15, 11/16, 11/27, 11/28, and 11/30) for between 16 and 93 minutes:
    - AQM-FB is located in the vicinity of the Fire Boat House
        - Elevated readings on 11/15, 11/22, 11/27, and 11/28 were related to offsite construction activity under a different contract.
        - Elevated readings on 11/17 were related to onsite construction activity. A water truck was deployed to mitigate airborne dust.
    - AQM-3 is located is located west of the FDR on Delancey Street.
        - Elevated readings on 11/1 and 11/30 were related to offsite construction activity under a different contract.
        - Elevated readings on 11/8 and 11/14 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; elevated readings on 11/4 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.

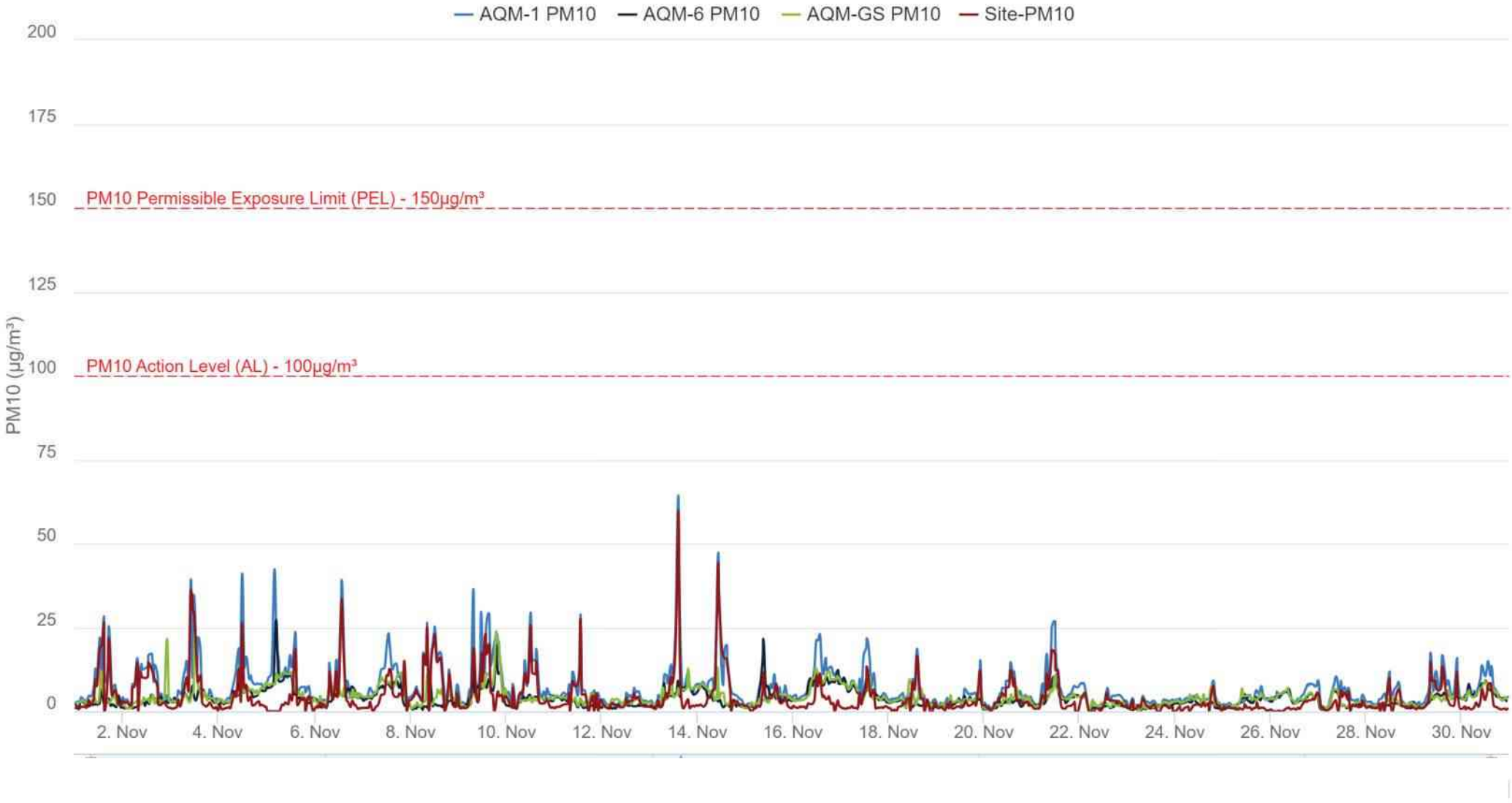
Mitigation Measures:

- 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.

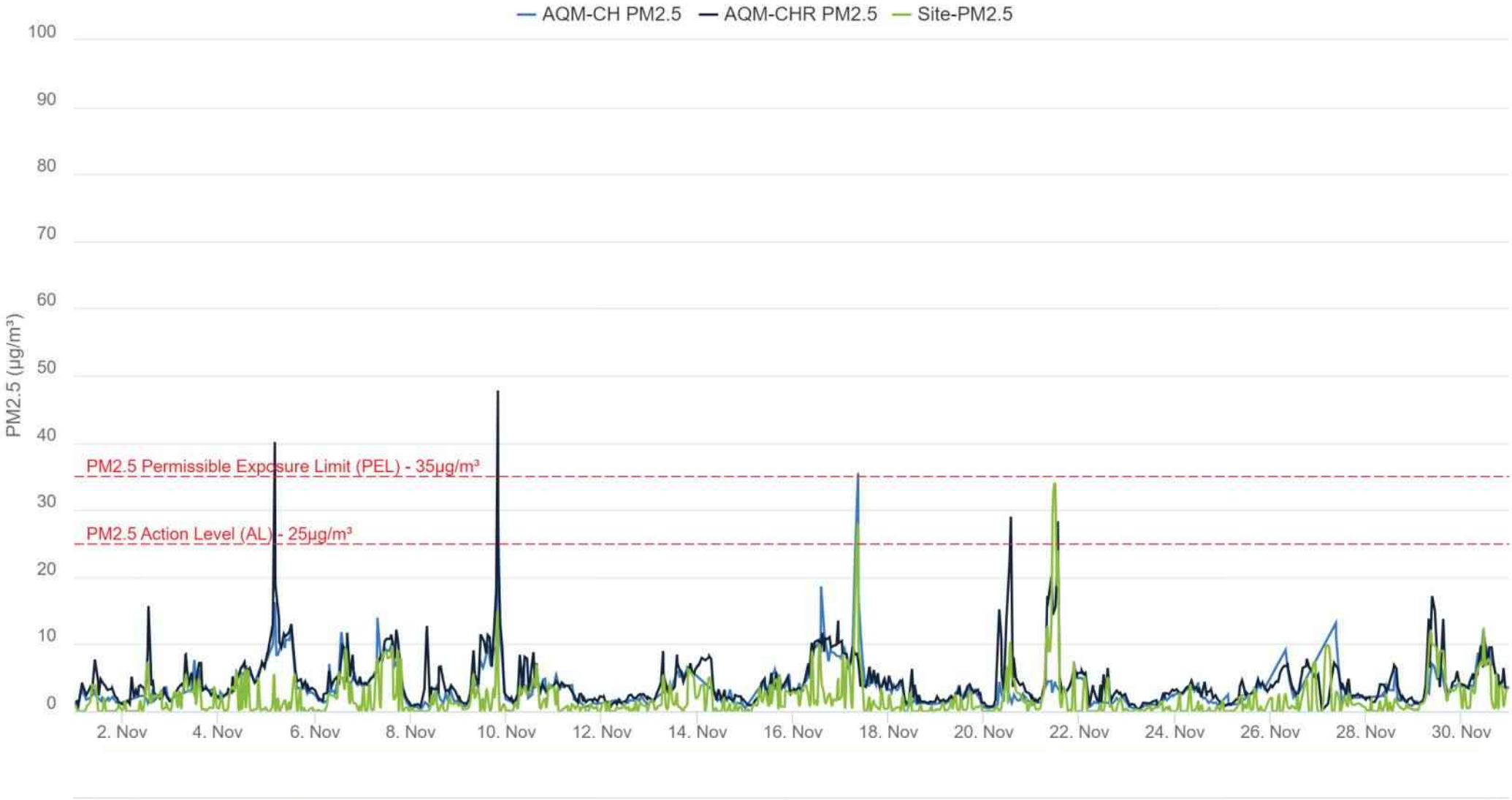
NOVEMBER 2023 DATA PLOTS


Reach A - PM2.5 - 15 min Running avg. (November 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. Nov
4. Nov
6. Nov
8. Nov
10. Nov
12. Nov
14. Nov
16. Nov
18. Nov
20. Nov
22. Nov
24. Nov
26. Nov
28. Nov
30. Nov

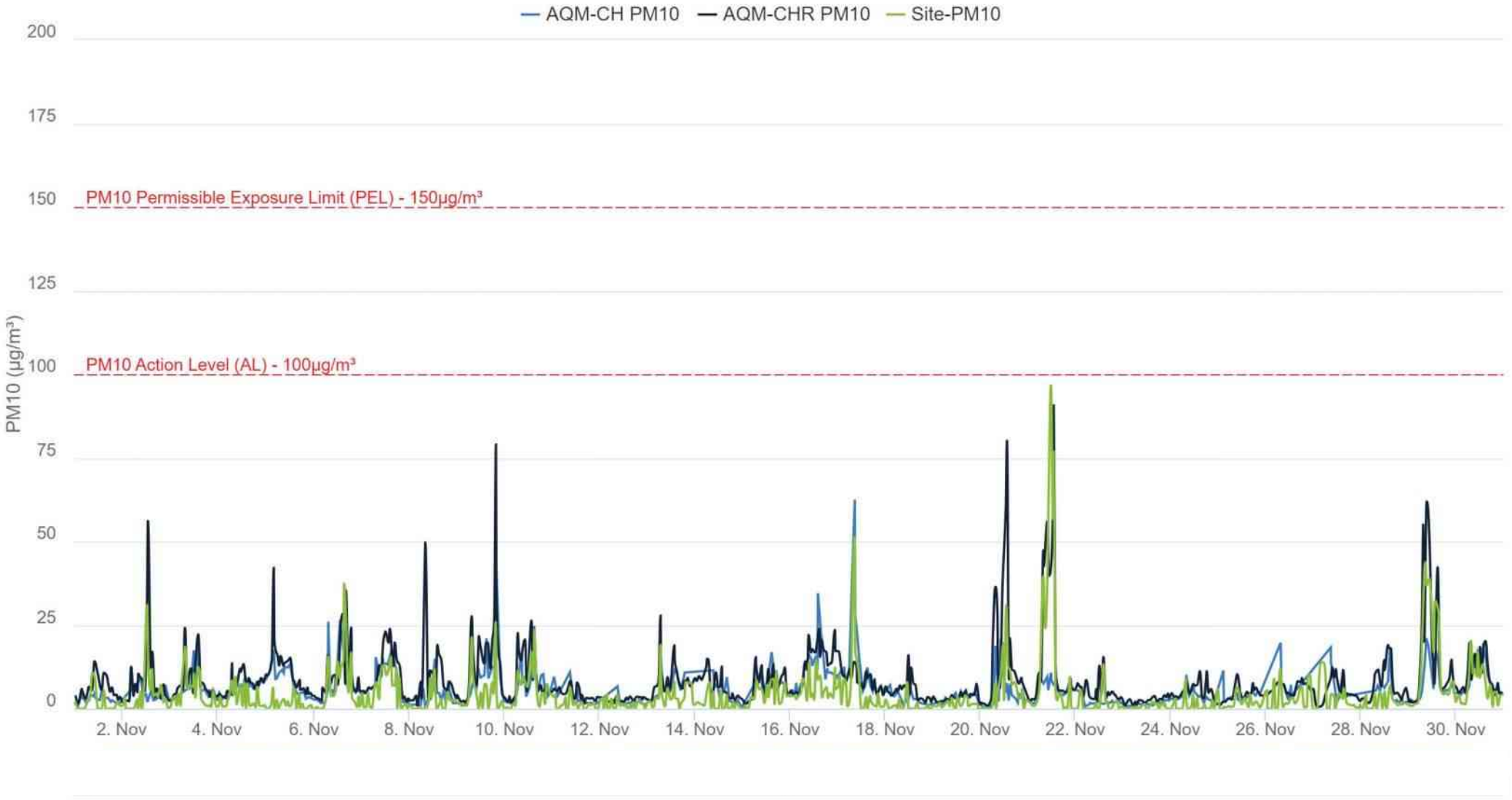
Reach A - PM10 - 15 min Running Avg. (November 2023)

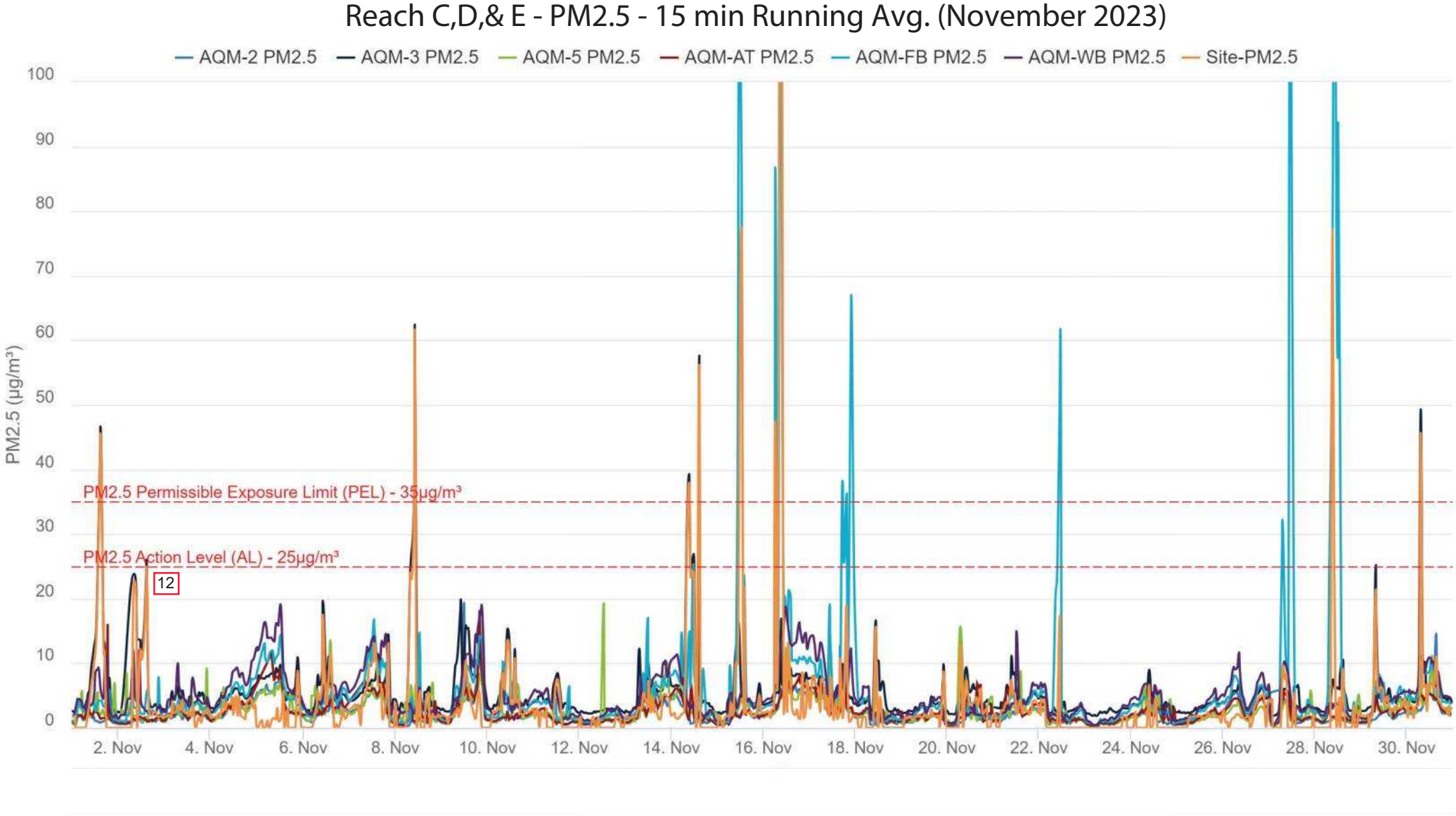


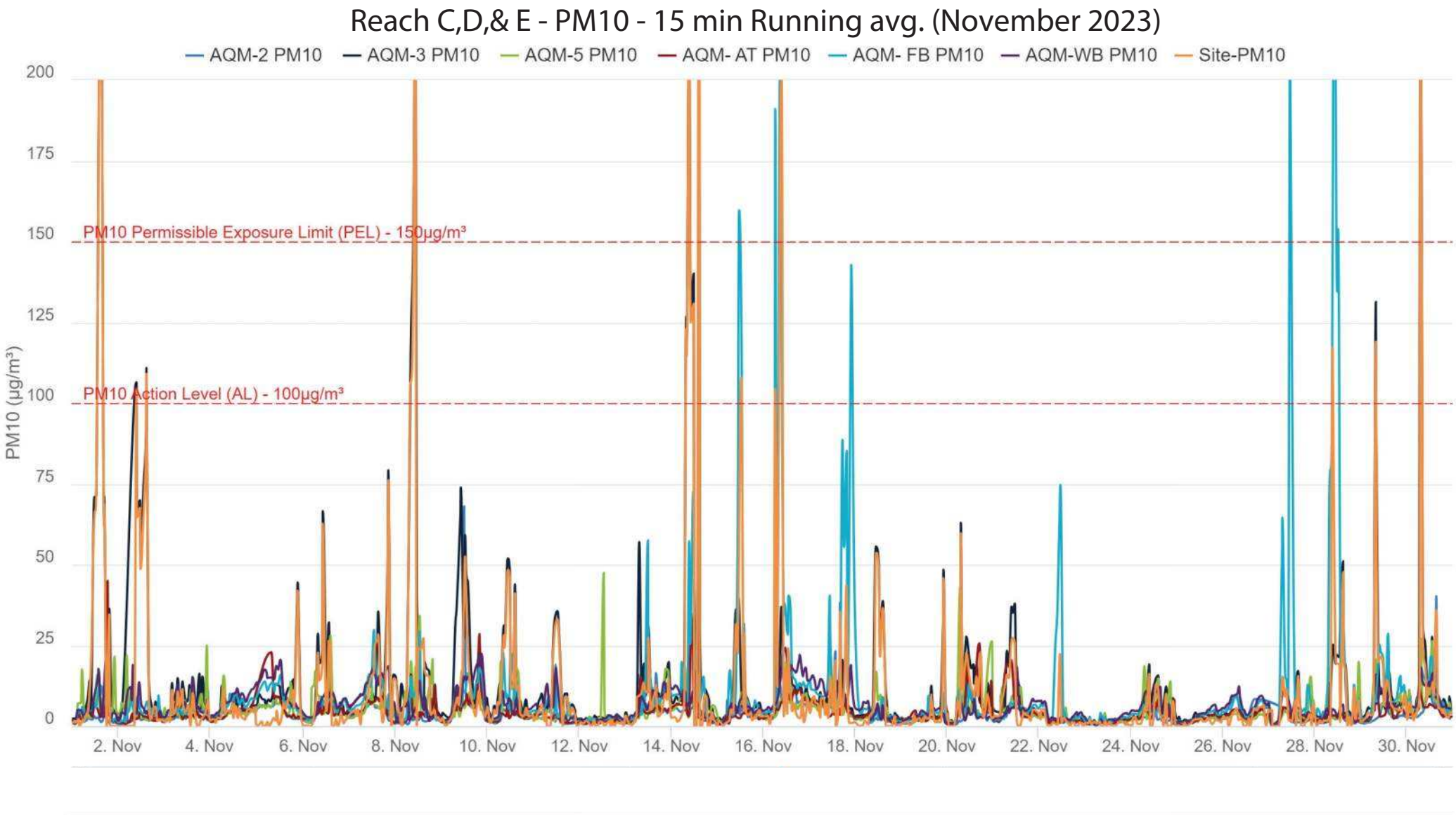
Reach B - PM2.5 - 15 min Running Avg. (November 2023)



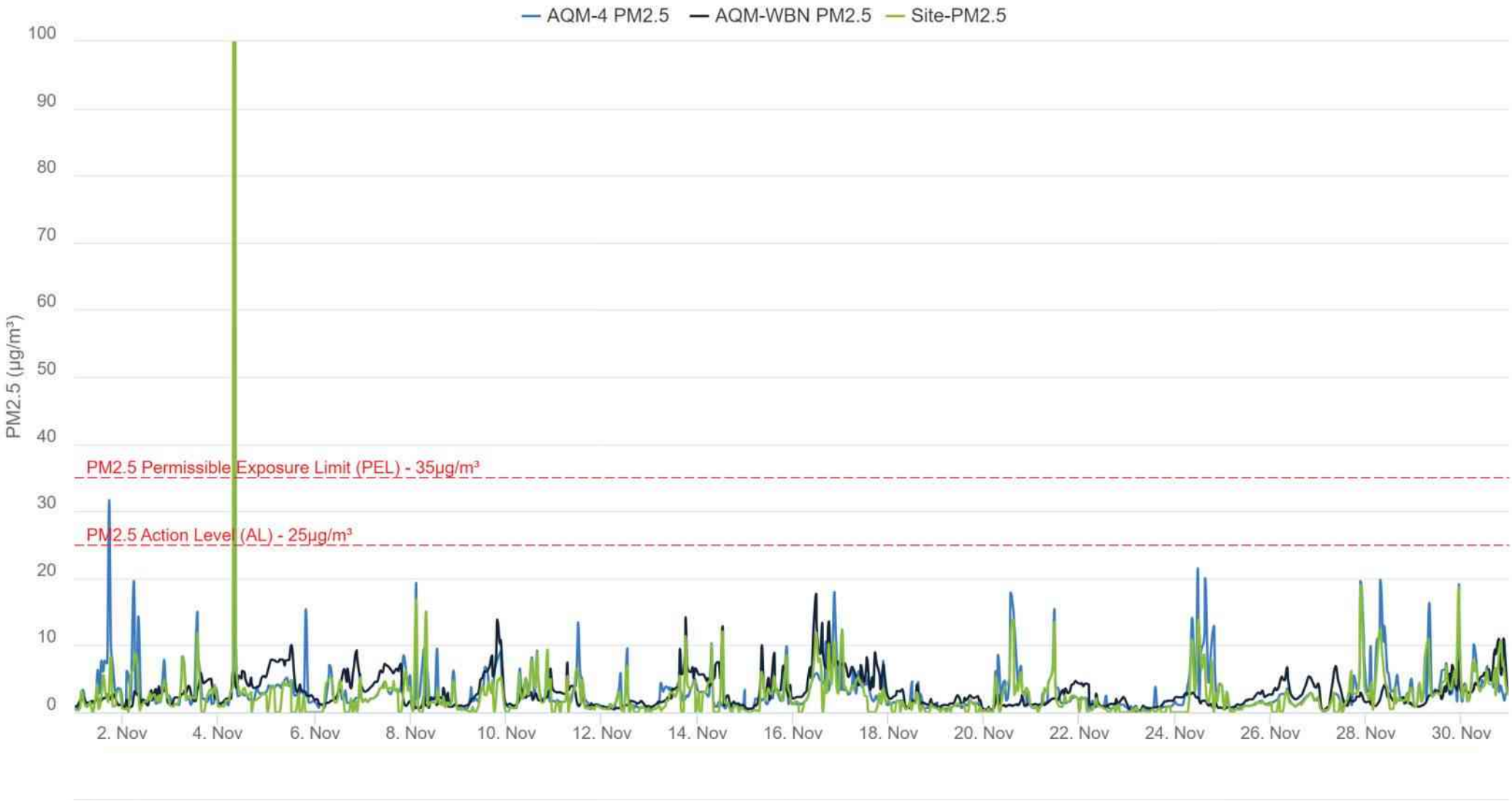
Reach B - PM10 - 15 min Running avg. (November 2023)



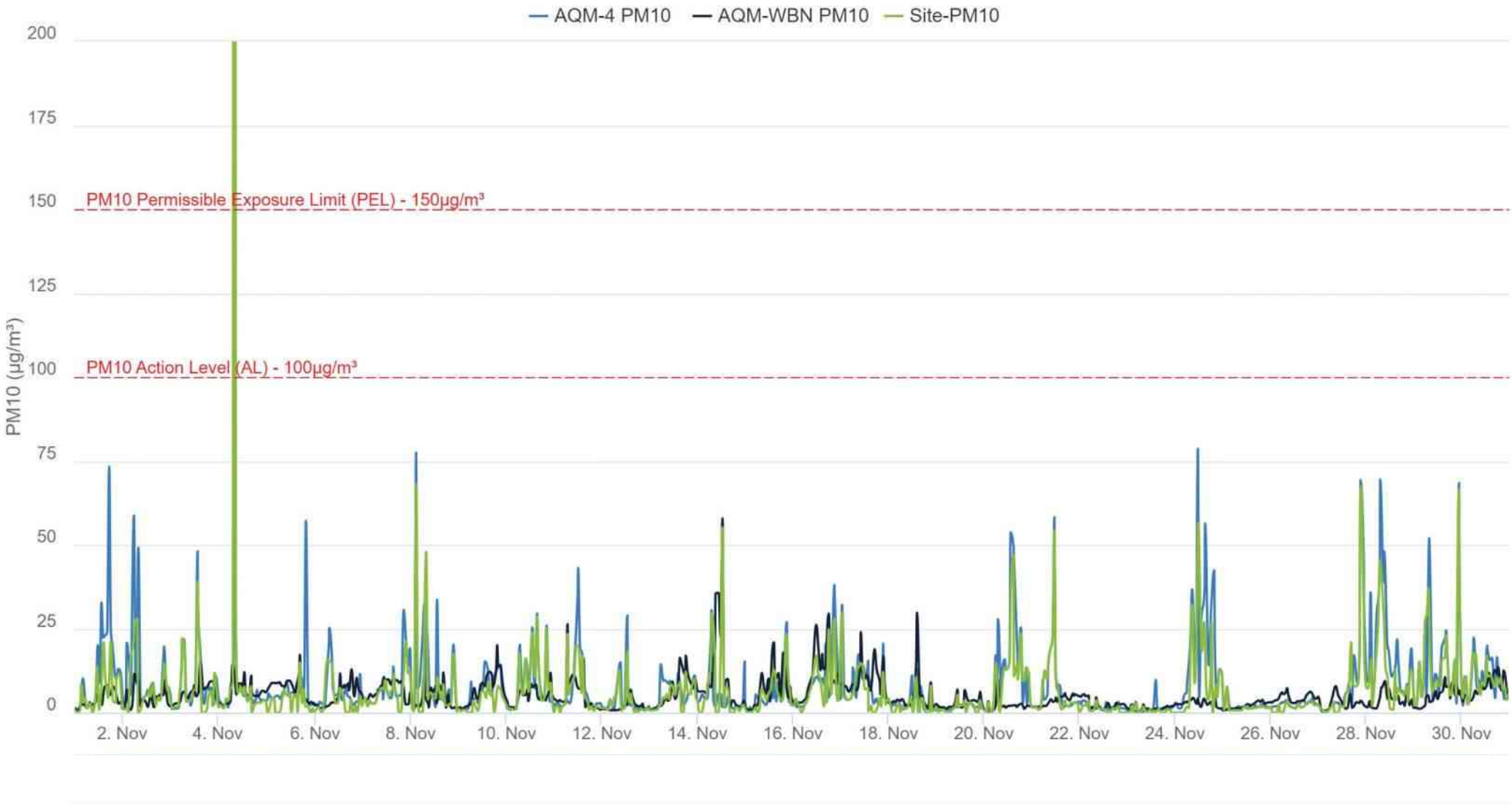

Reach C,D,& E - PM2.5 - 15 min Running Avg. (November 2023)
AQM-2 PM2.5
AQM-3 PM2.5
AQM-5 PM2.5
AQM-AT PM2.5
AQM-FB PM2.5
AQM-WB PM2.5
Site-PM2.5
PM2.5 (µg/m³)
100
90
80
70
60
50
40
30
20
10
0
PM2.5 Permissible Exposure Limit (PEL) - 35µg/m³
PM2.5 Action Level (AL) - 25µg/m³
12
2. Nov
4. Nov
6. Nov
8.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


Reach C,D,& E - PM10 - 15 min Running avg. (November 2023)
AQM-2 PM10
AQM-3 PM10
AQM-5 PM10
AQM- AT PM10
AQM- FB PM10
AQM-WB 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. Nov
4. Nov
6. Nov
8. Nov
10. Nov
12. Nov
14. Nov
16. Nov
18. Nov
20. Nov
22. Nov
24. Nov
26. Nov
28. Nov
30. Nov

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



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



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

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

Summary of Data December 2023

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

- AQM-1 on 12/15 for 21 minutes;
- AQM-CH on 12/8 for 20 minutes;
- AQM-CHR on 12/16 for 14 minutes and 12/22 for 20 minutes;
- AQM-FB on 12/9 for 26 minutes;
- AQM-WB on 12/2 for 29 minutes, 12/9 for 20 minutes, and 12/26 for 37 minutes;
- AQM-3 on 12/16 for 15 minutes
- AQM-4 on 12/1 for 13 minutes and 12/22 for 15 minutes; and
- AQM-HS on 12/1 for 17 minutes and 12/26 for 8 minutes.

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

- AQM-1 on 12/15 for 20 minutes;
- AQM-CHR on 12/22 for 19 minutes; and
- AQM-3 on 12/16 for 15 minutes and 12/22 for 18 minutes.

For the month of December 2023, PM net 2.5 levels were exceeded on 12/1, 12/8, 12/9, 12/15, 12/16, 12/20, 12/22, 12/26, and 12/27. PM net 10 levels were exceeded on 12/9, 12/15, 12/16, and 12/22.

For the month of December 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 14 occasions (12/1, 12/2, 12/8, 12/9, 12/15, 12/16, 12/22, and 12/26) for between 8 and 37 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 12/15 were related to onsite construction activity. A water truck was deployed to mitigate airborne dust.
    - AQM-CH is located on Jackson Street adjacent to the FDR.
        - Elevated readings on 12/8 were related to offsite construction activity under a different contract.
        - Elevated readings on 12/26 were related to unknown offsite 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 12/16 and 12/22 were related to onsite construction vehicle traffic. 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 12/9 were due to unknown offsite activity. A water truck was deployed to mitigate airborne dust.
    - AQM-WB is in the vicinity of the Williamsburg Bridge along the East River; elevated readings on 12/2, 12/9, and 12/26 were related to onsite construction activity. A water truck was deployed to mitigate airborne dust.
    - AQM-3 is located is located west of the FDR on Delancey Street; the elevated readings on 12/16 were related to onsite construction activity.
    - AQM-4 is located near the former Tennis house along the shared use path/construction access road and the FDR; the elevated readings on 12/4 and 12/22 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 12/1 were related to unknown offsite activities.
    - The elevated readings on 12/26 were caused by onsite construction activities.

PM 10 µg/m^3

- PM 10 µg/m^3 levels surpassed the PEL (15-minute TWA) on four occasions (12/15, 12/16, and 12/22) for between 15 and 20 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 12/15 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 12/22 were related to onsite construction vehicle traffic. A water truck was deployed to mitigate airborne dust.
    - AQM-3 is located is located west of the FDR on Delancey Street; the elevated readings on 12/16 and 12/22 were related to onsite construction activity.

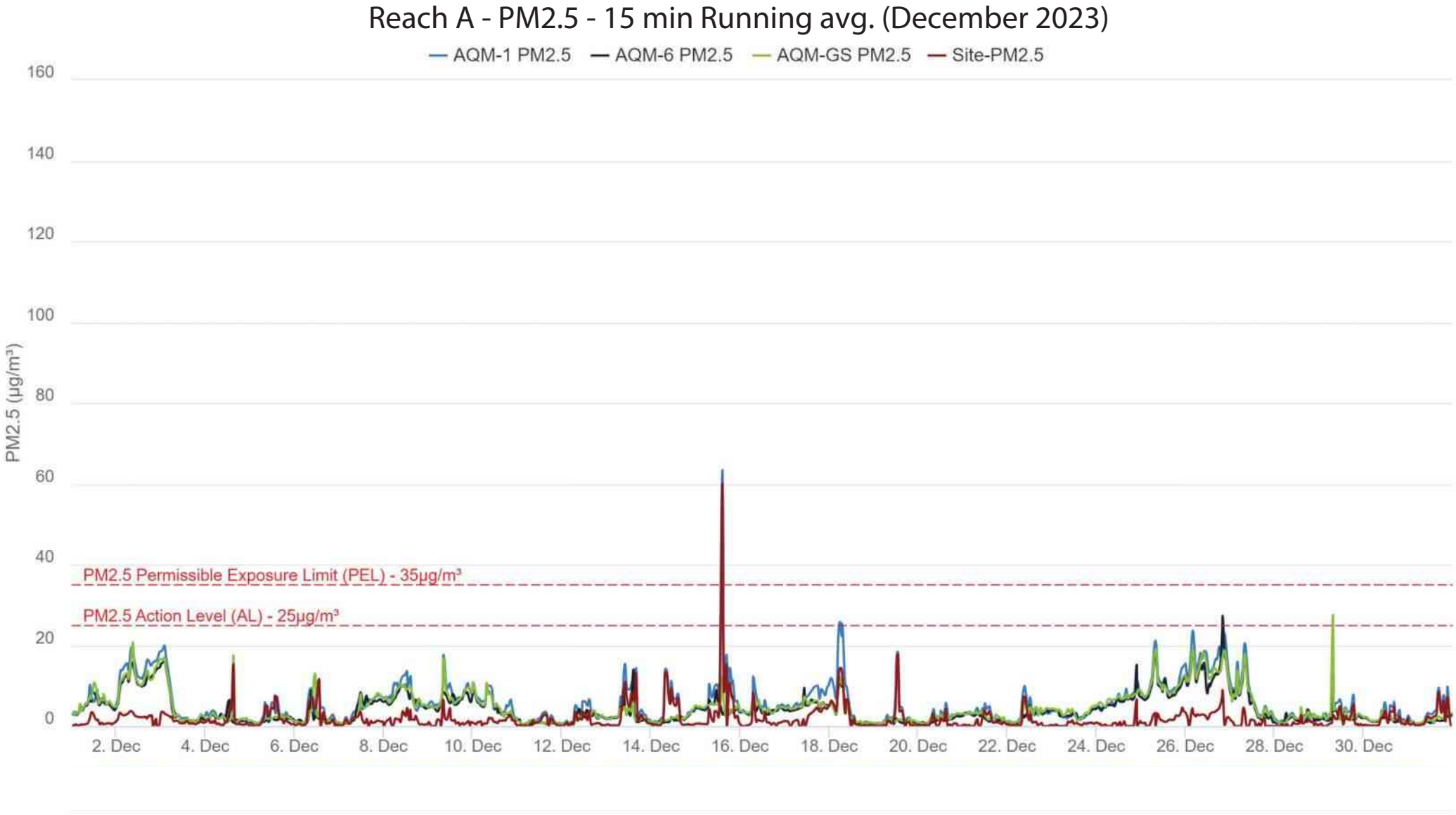
Mitigation Measures

- 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.

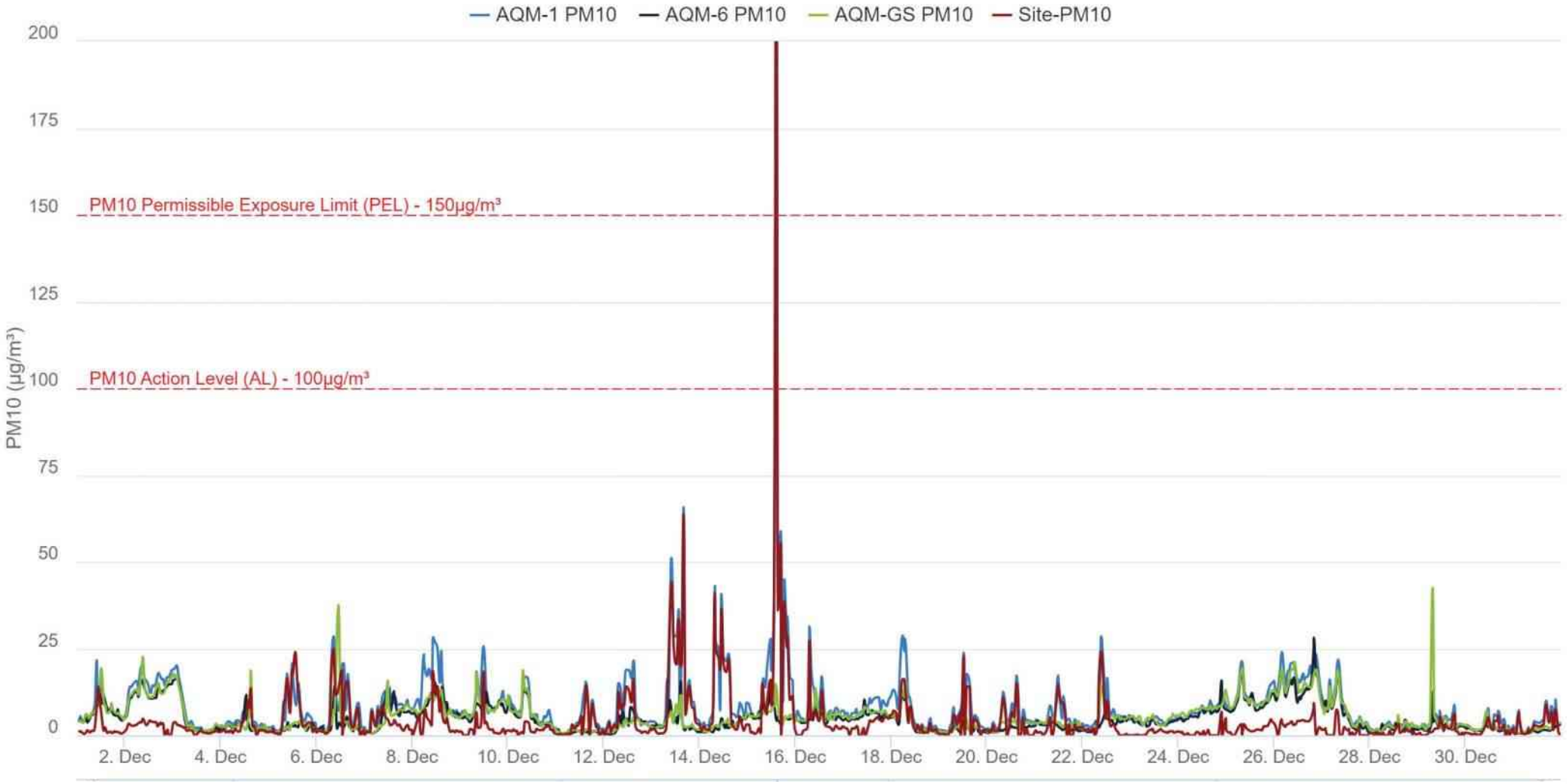
Notes

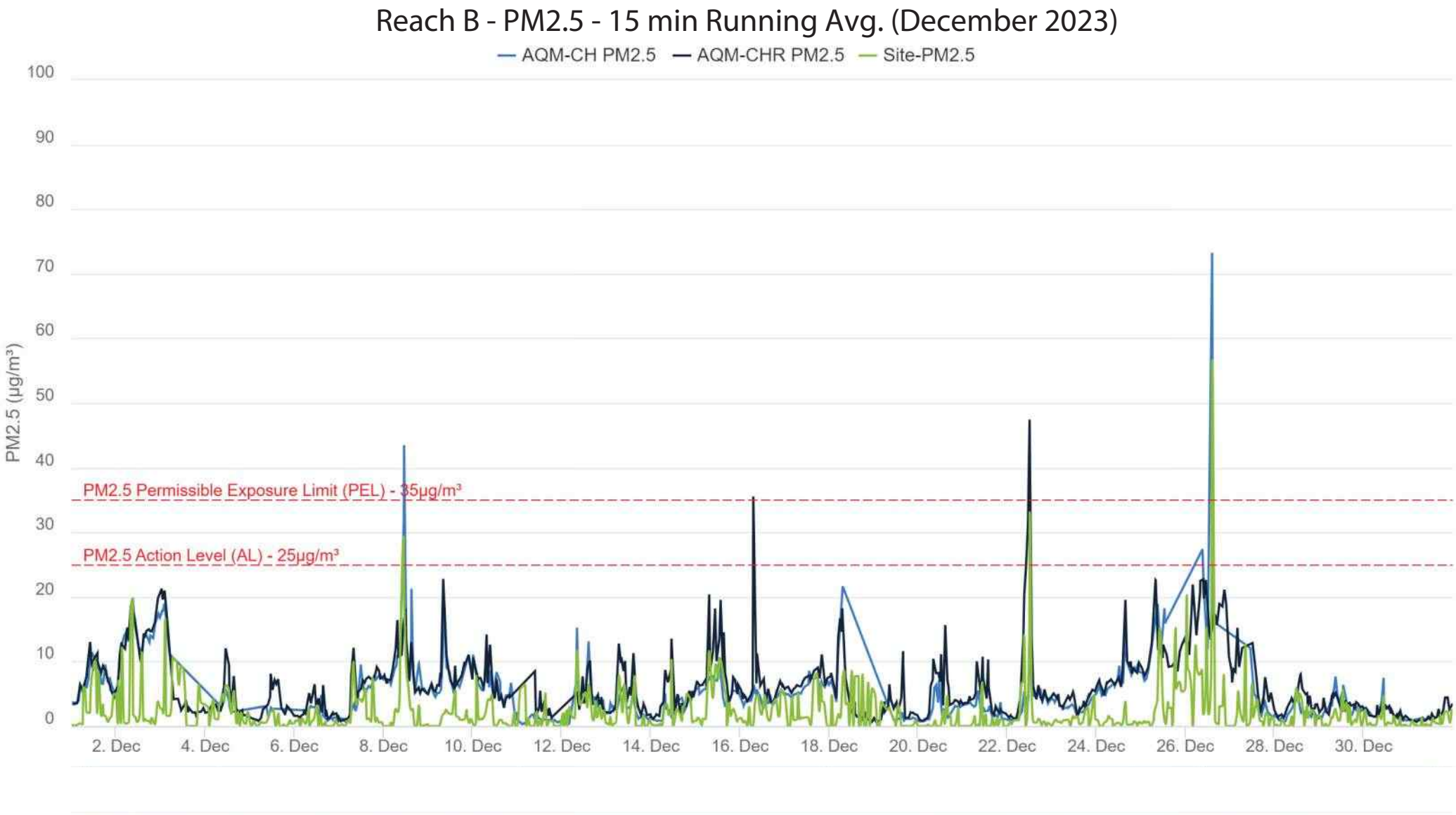
- AQM-TH was disconnected from power and not monitoring from December 6th to December 27th.

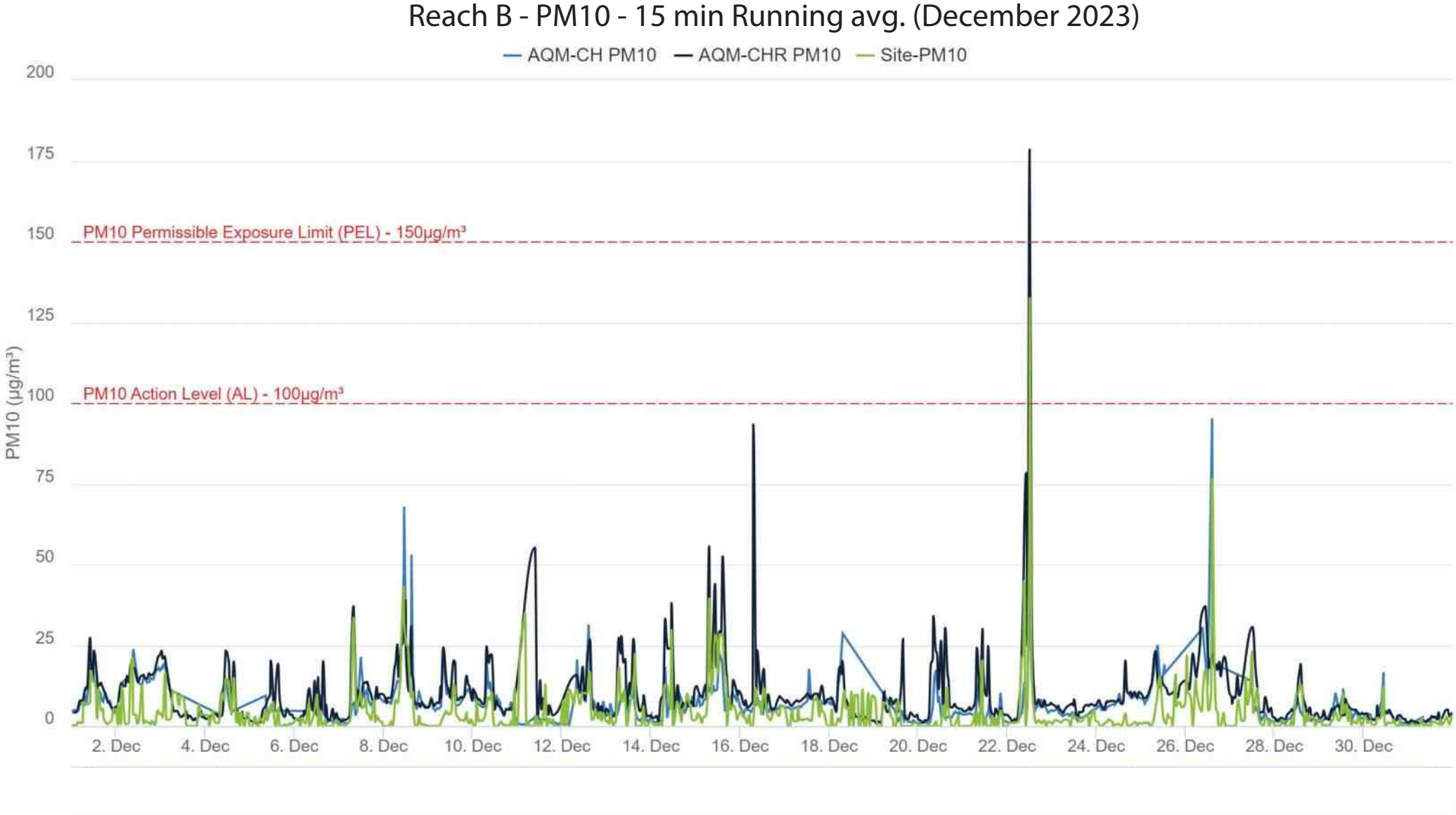
DECEMBER 2023 DATA PLOTS

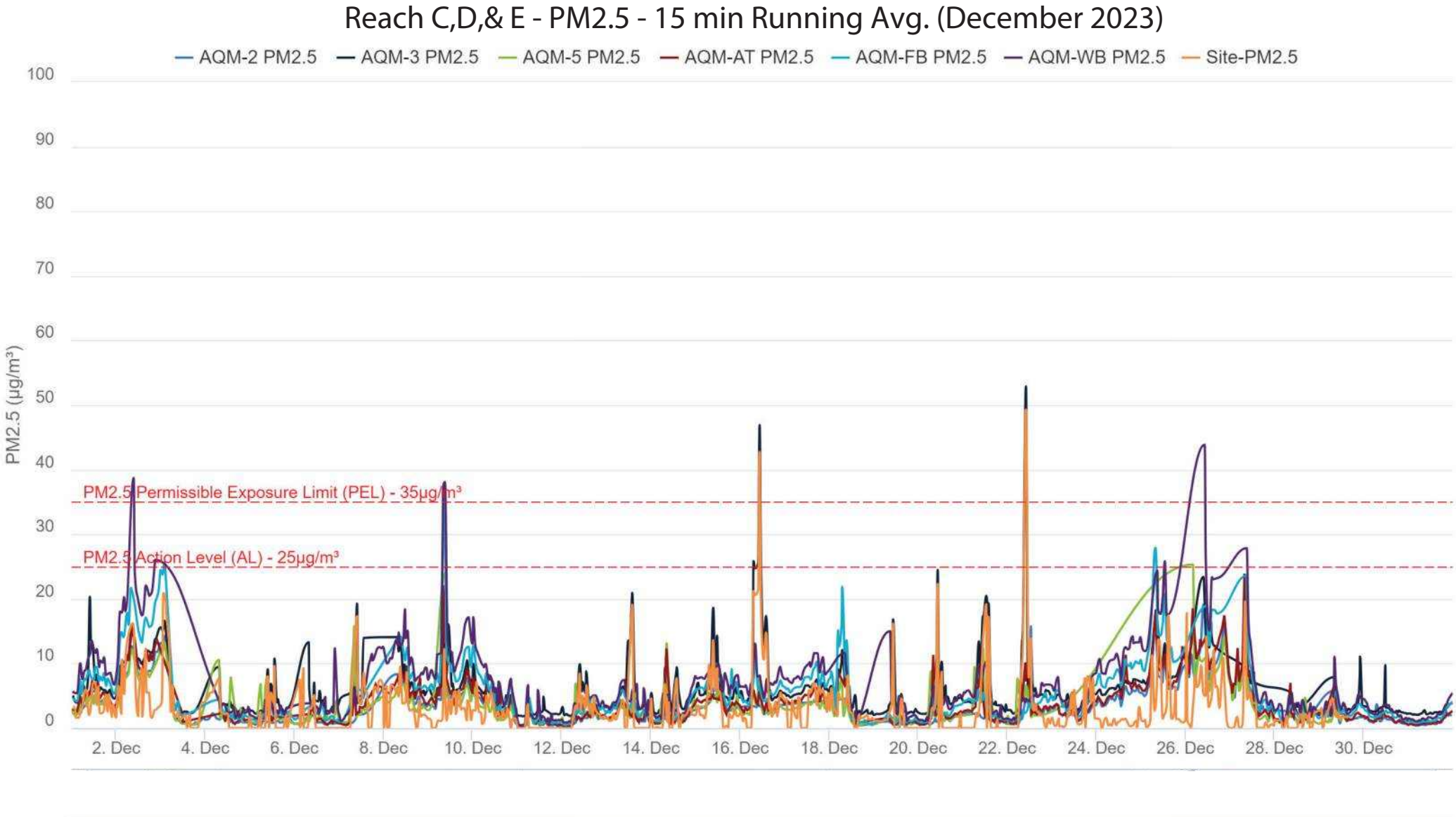

Reach A - PM2.5 - 15 min Running avg. (December 2023)
AQM-1 PM2.5
AQM-6 PM2.5
AQM-GS PM2.5
Site-PM2.5
PM2.5 (µg/m³)
160
140
120
100
80
60
40
20
0
PM2.5 Permissible Exposure Limit (PEL) - 35µg/m³
PM2.5 Action Level (AL) - 25µg/m³
2. Dec
4. Dec
6. Dec
8. Dec
10. Dec
12. Dec
14. Dec
16. Dec
18. Dec
20.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

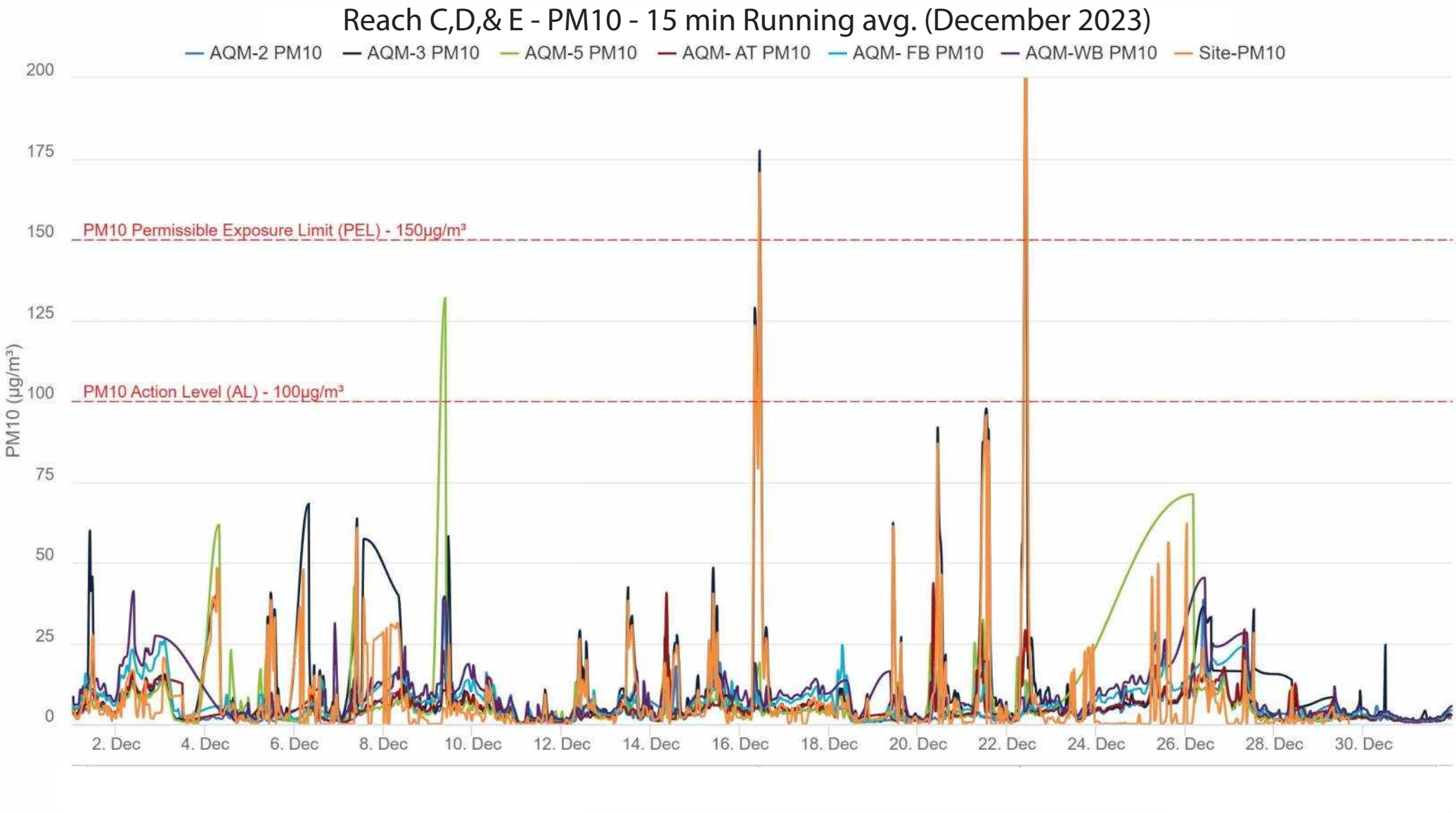
Reach A - PM10 - 15 min Running Avg. (December 2023)



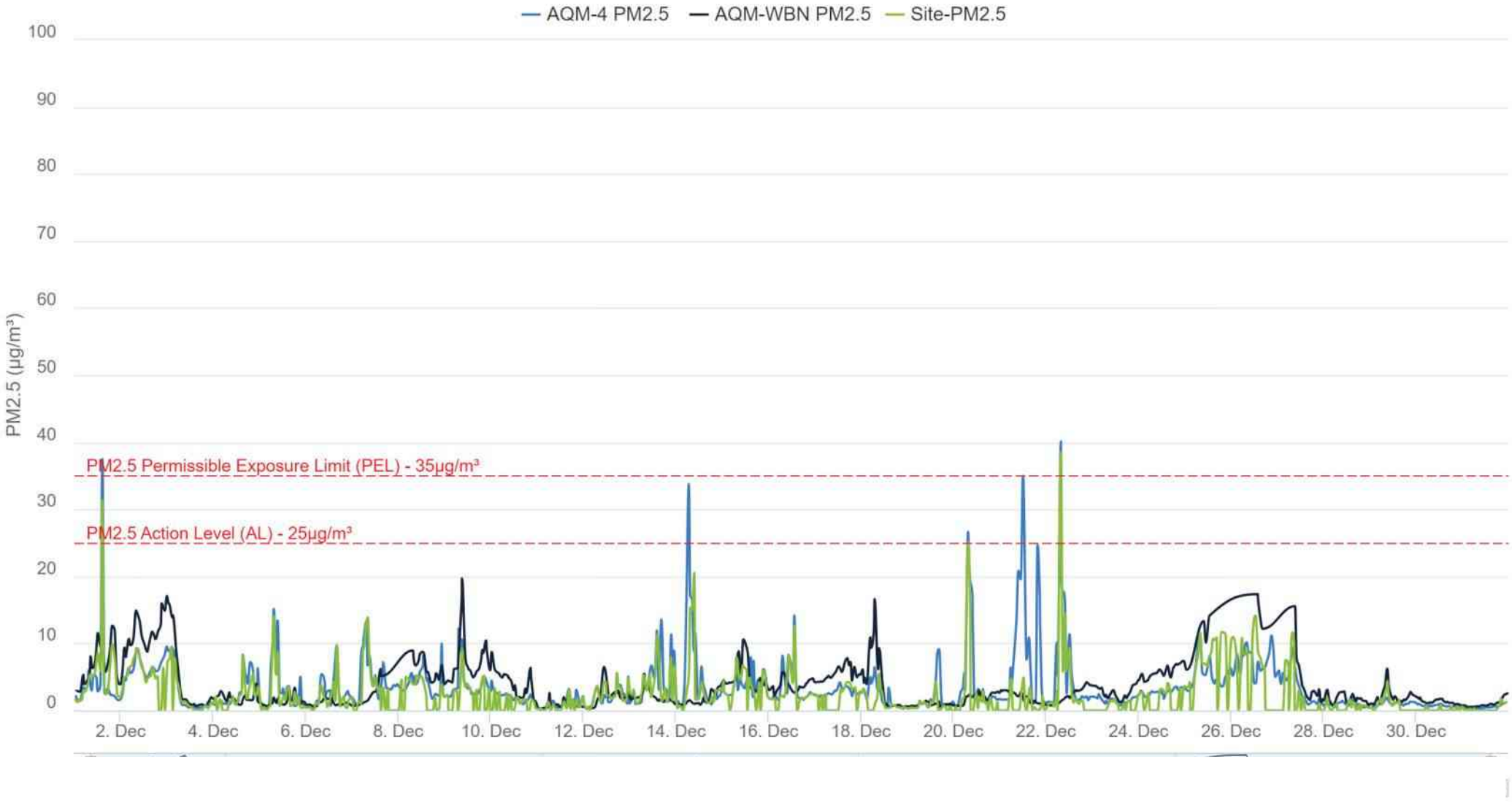

Reach B - PM2.5 - 15 min Running Avg. (December 2023)
AQM-CH PM2.5
AQM-CHR PM2.5
Site-PM2.5
PM2.5 (µg/m³)
100
90
80
70
60
50
40
30
20
10
0
PM2.5 Permissible Exposure Limit (PEL) - 35µg/m³
PM2.5 Action Level (AL) - 25µg/m³
2. Dec
4. Dec
6. Dec
8. Dec
10. Dec
12. Dec
14. Dec
16. Dec
18. Dec
20. Dec
22.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


Reach B - PM10 - 15 min Running avg. (December 2023)
AQM-CH PM10
AQM-CHR 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. Dec
4. Dec
6. Dec
8. Dec
10. Dec
12. Dec
14. Dec
16. Dec
18. Dec
20. Dec
22. Dec
24. Dec
26. Dec
28. Dec
30. Dec

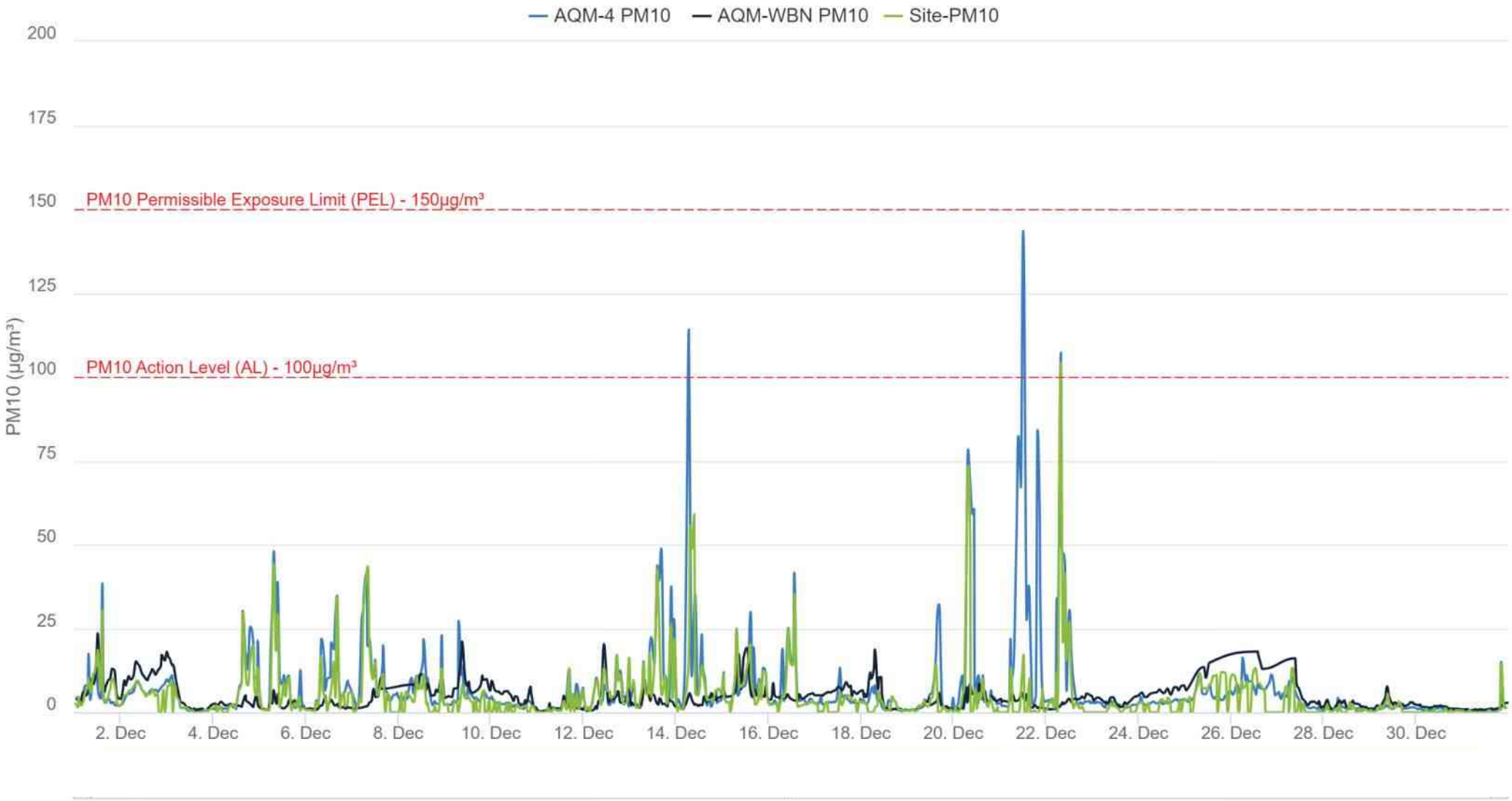

Reach C,D,& E - PM2.5 - 15 min Running Avg. (December 2023)
AQM-2 PM2.5
AQM-3 PM2.5
AQM-5 PM2.5
AQM-AT PM2.5
AQM-FB PM2.5
AQM-WB PM2.5
Site-PM2.5
PM2.5 (µg/m³)
100
90
80
70
60
50
40
30
20
10
0
PM2.5 Permissible Exposure Limit (PEL) - 35µg/m³
PM2.5 Action Level (AL) - 25µg/m³
2. Dec
4. Dec
6. Dec
8. Dec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

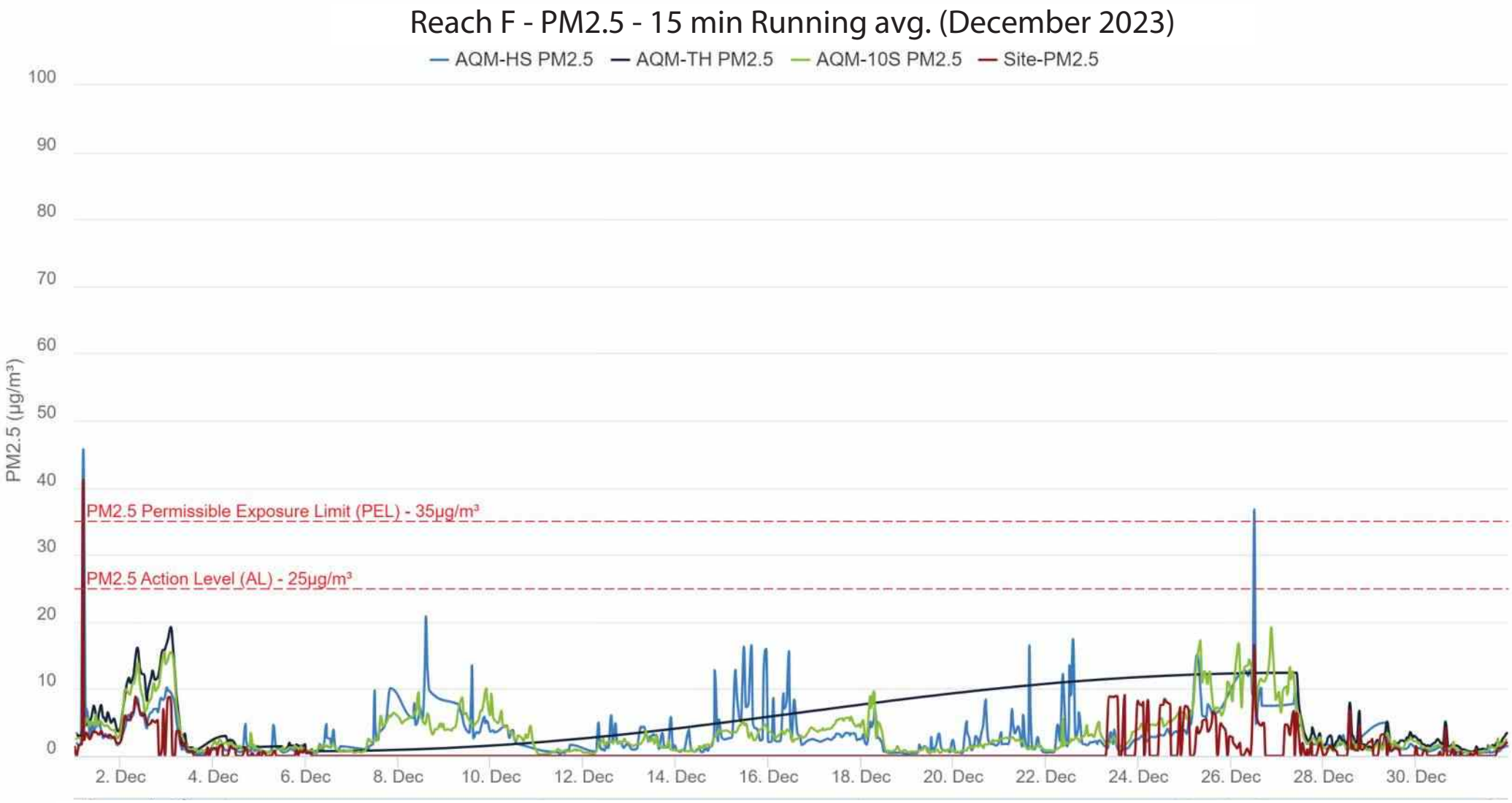

Reach C,D,& E - PM10 - 15 min Running avg. (December 2023)
AQM-2 PM10
AQM-3 PM10
AQM-5 PM10
AQM- AT PM10
AQM- FB PM10
AQM-WB PM10
Site-PM10
PM10 (µg/m³)
200
175
150
125
100
75
50
25
0
PM10 Permissible Exposure Limit (PEL) - 150µg/m³
PM10 Action Level (AL) - 100µg/m³
2. Dec
4. Dec
6. Dec
8. Dec
10. Dec
12. Dec
14. Dec
16. Dec
18. Dec
20. Dec
22. Dec
24. Dec
26. Dec
28. Dec
30. Dec

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

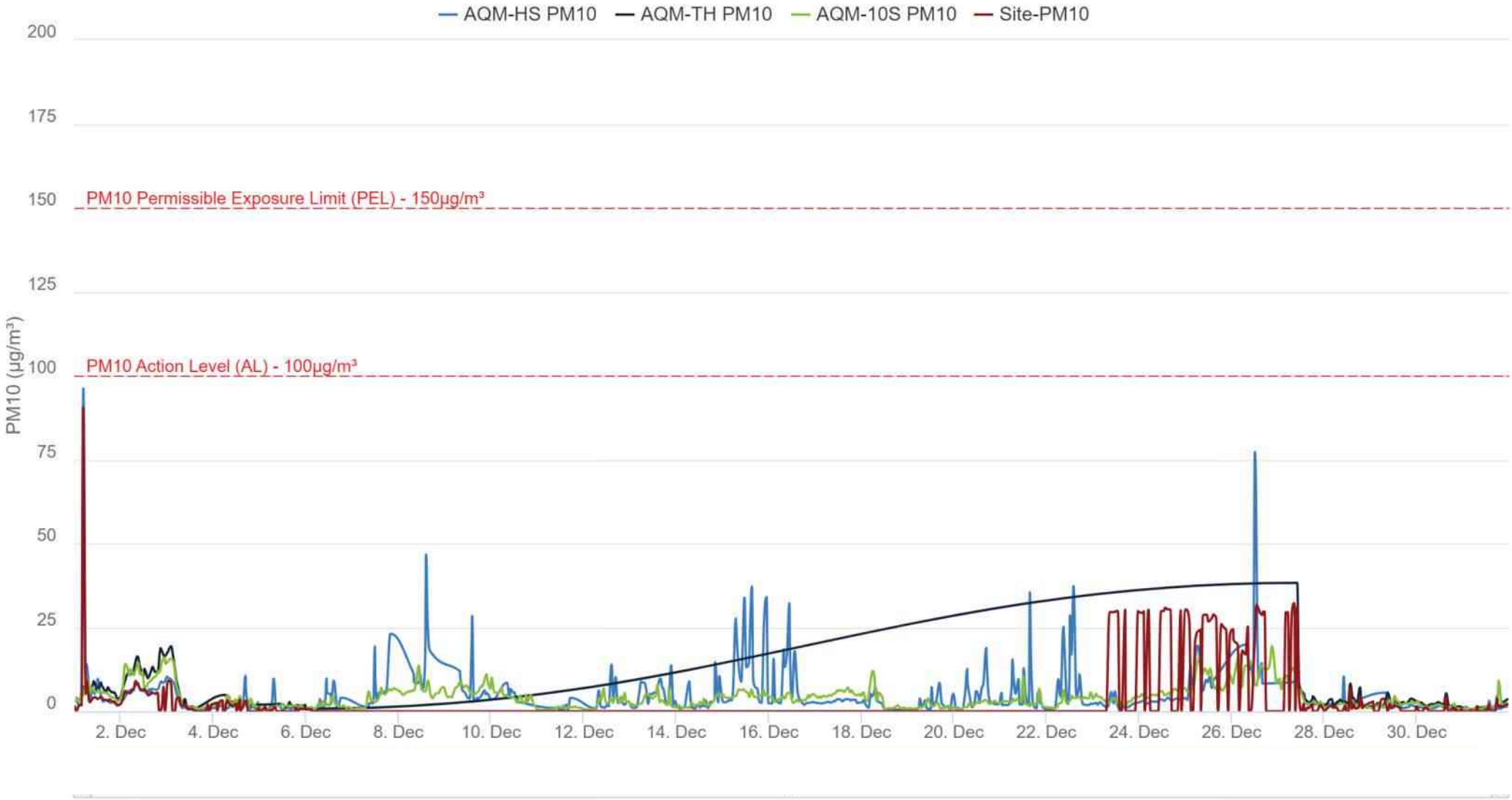


Reach F - PM10 - 15 min Running avg. (December 2023)




Reach F - PM2.5 - 15 min Running avg. (December 2023)
AQM-HS PM2.5
AQM-TH PM2.5
AQM-10S 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. Dec
4. Dec
6. Dec
8. Dec
10. Dec
12. Dec
14. Dec
16. Dec
18. Dec
20. Dec
22. Dec
24. Dec
26. Dec
28. Dec
30. Dec

Reach G, H & I - PM10 - 15 min Running avg. (December 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*

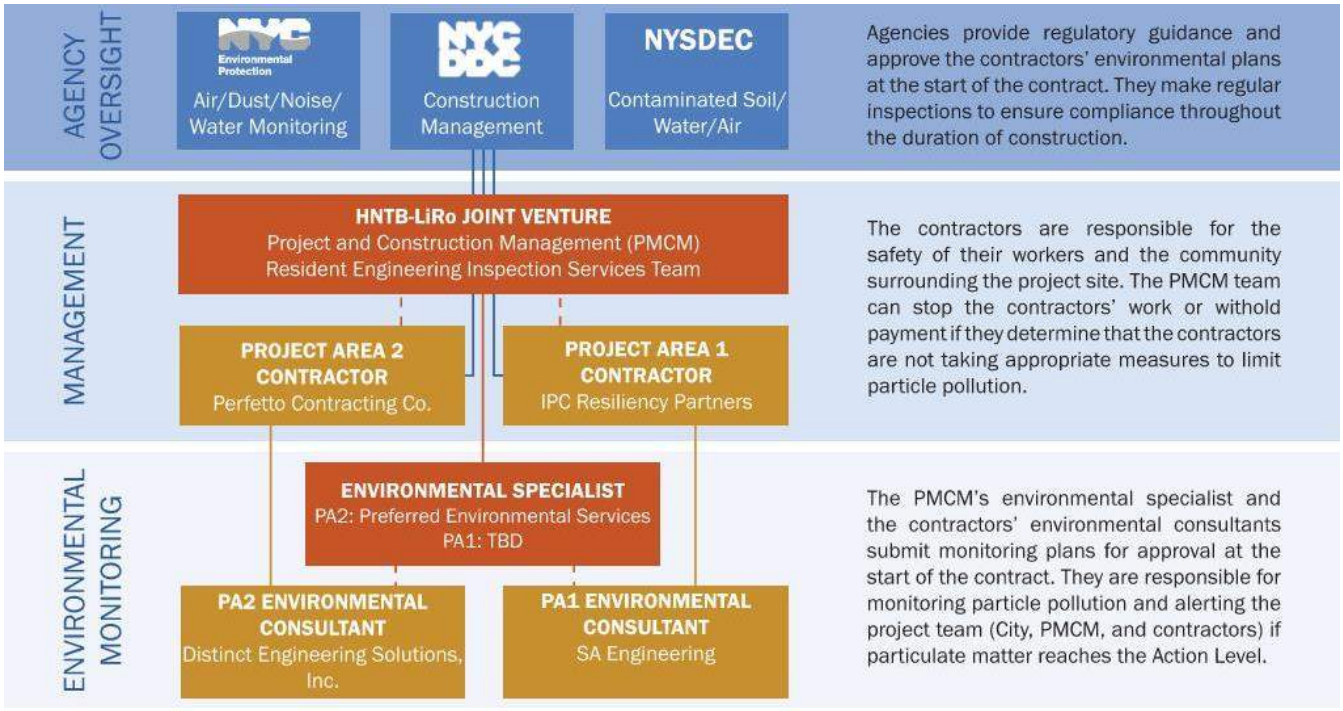


Fig.4 East Side Coastal Resiliency Air Quality Monitoring Flow Chart

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