

Community Air Monitoring Project for VOCs in South Portland/Portland, Maine



August 24, 2022
EPA National Ambient Air Monitoring Conference
Pittsburgh, PA

Andrew Johnson, Director
Division of Air Quality Assessment

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

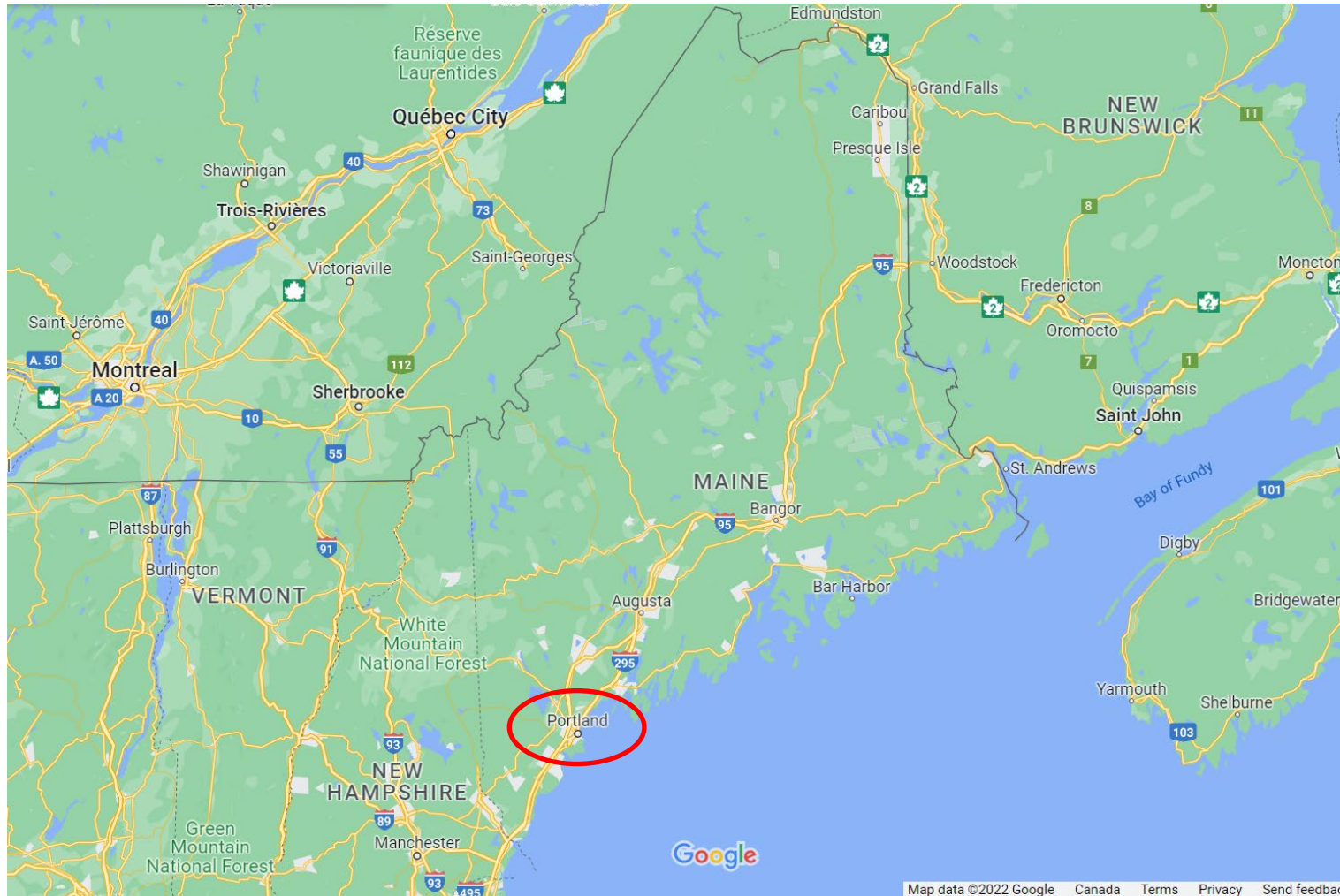
Protecting Maine's Air, Land and Water

Presentation Outline

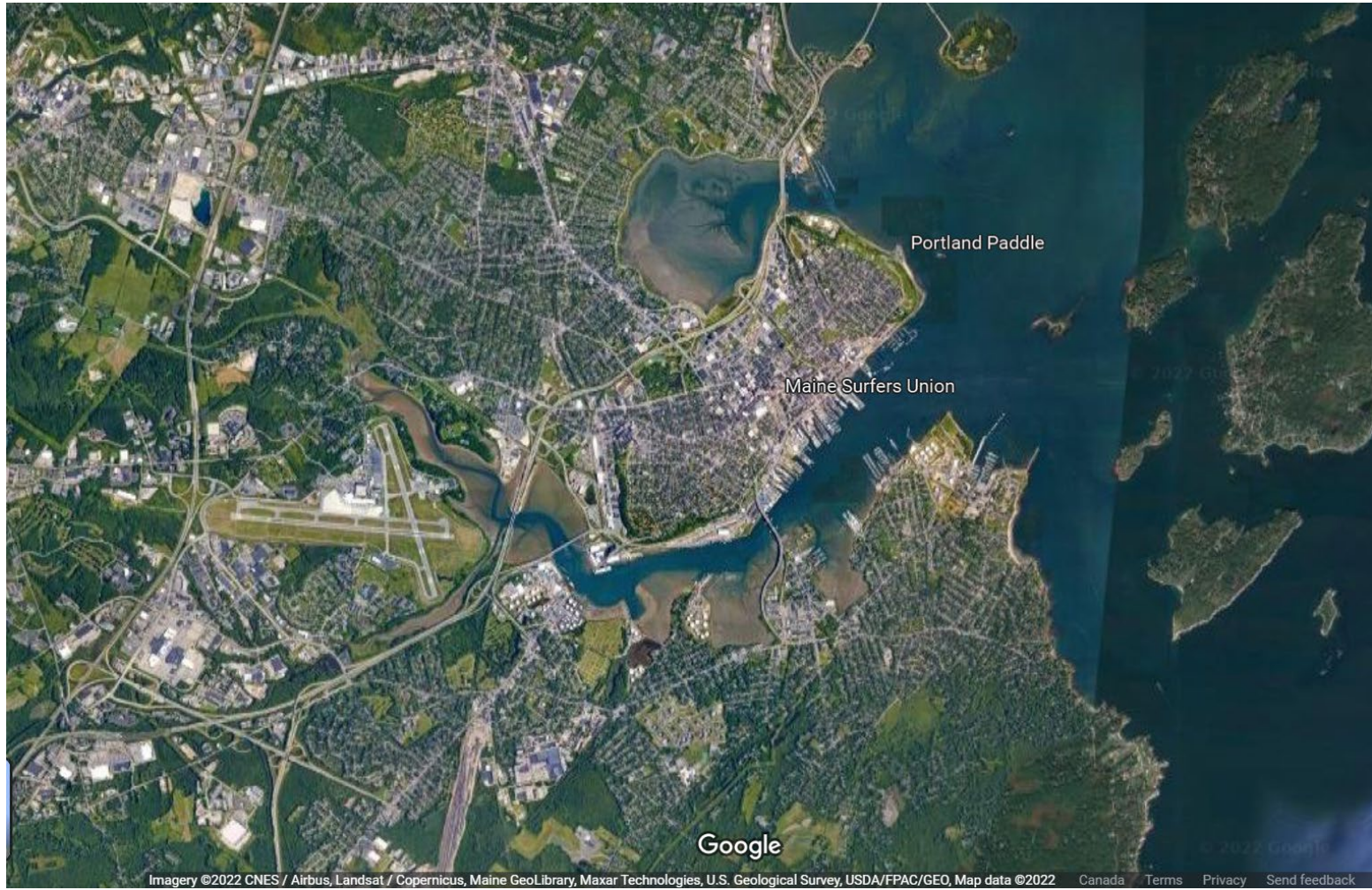
- The setting.
- Community concerns.
- Stakeholders planning process.
- Adopted monitoring plan details.
- Results to date.
- Next steps



The setting: Northern New England



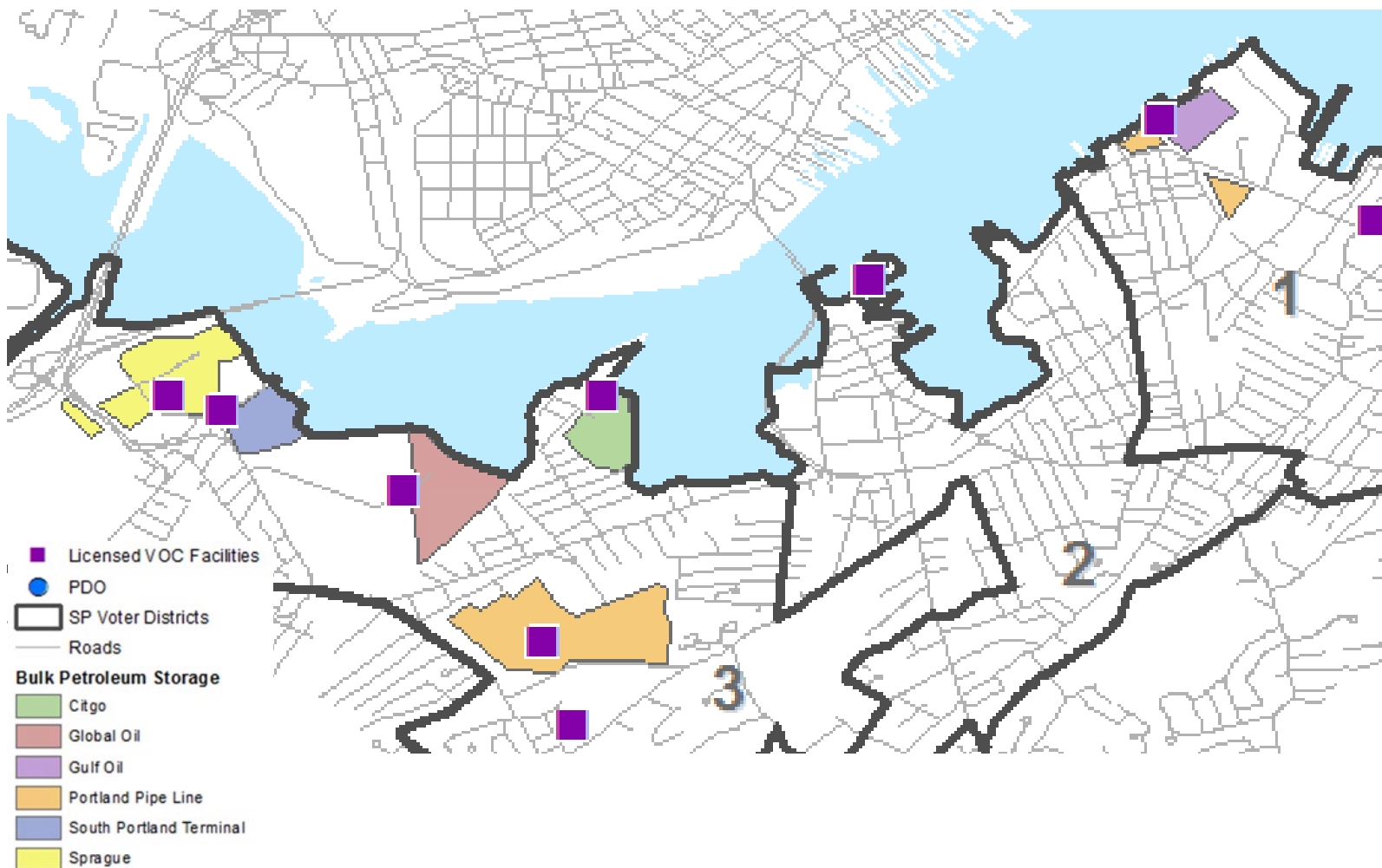
The setting: Greater Portland Area



The setting: South Portland/Portland



Map of Licensed VOC Facilities



Community Concerns: Long history on air quality



Overview of Ambient Air Monitoring and Air Quality in Maine and the South Portland Area

Andrew Johnson, Director
Division of Air Quality Assessment
Bureau of Air Quality

Presented at
South Portland City Council Work Session on Air Quality
February 24, 2014

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

Protecting Maine's Air, Land and Water

Community Concerns: recent issues

- Public notice re: EPA consent agreements on emissions violations by two facilities.
- Citizen concerns over air emissions and/or odors from the petroleum product storage facilities.
- Repeated requests for air quality monitoring done within City boundaries.
- DEP promised it would work with the City on accomplishing that goal



April 19, 2019 S.P. City Council Workshop

Stakeholders Planning Group

- South Portland City officials.
- South Portland City Council members.
- Petroleum storage facilities managers & their attorneys.
- Maine Center for Disease Control staff.
- DEP Bureau of Air Quality monitoring, laboratory and licensing and compliance staff.
- Media representatives (on occasion).



Numerous Meetings (14) 2019 - 2022

- May 23, 2019
- June 6, 2019
- June 20, 2019
- July 25, 2019
- August 14, 2019
- August 29, 2019 (Portland City Officials)
- November 20, 2019
- November 26, 2019 (South Portland City Council)
- April 30, 2020 (CAAC)
- June 17, 2020 (Portland Sustainability & Transportation Committee)
- August 31, 2020 (CAAC)
- September 18, 2020 (Portland West End Neighborhood Group)
- February 24, 2021
- April 14, 2022 (CAAC)



Adopted Monitoring Plan Details

- City of South Portland's stated monitoring objective:
 - **“Is the air safe to breathe?”**
- Initial monitoring focus to be on measuring VOCs
- “Not targeting an industry, we’re protecting a community”
 - There are a variety of VOC sources in the City
- Monitoring effort to consist of two phases:
 - An immediate “grab” sampling phase done by citizens
 - Fixed 24-hour sampling sites phase, operated by DEP staff
- One fixed 24-hour sampling site in each district
(i.e. five sites, plus one “portable” sampling system)



VOC Ambient Air Monitoring Project Goals

- To measure VOC air quality across the cities generally to gain an in-depth understanding of them, recognizing there are a variety of VOC sources present in both cities.
- To report findings to the public and to work with the State Toxicologist to interpret those findings.
- To identify potential sources of VOC emissions that may require further controls or scrutiny.
- To correlate odor incidents as observed by the public with VOC data



Phase 1: Grab Sampling Completed

- Citizen training session on June 10, 2019
- 6 canisters made available each week for 12 weeks (June 10 – September 9)
 - 5 assigned to citizen volunteers
 - 1 assigned to S.P. Fire Department
 - 72 canisters in total
- 56 valid samples analyzed by DEP Air Lab
- 12 samples were invalid
- 4 canisters have not been returned
- Data was shared with Maine CDC



ME09381
ME09381 Sample Date: _____
Sample Start Time: _____ AM / PM
Sample End Time: _____ AM / PM
Comments:

Relinquished By: _____ Date: _____
Received By: _____ Date: _____

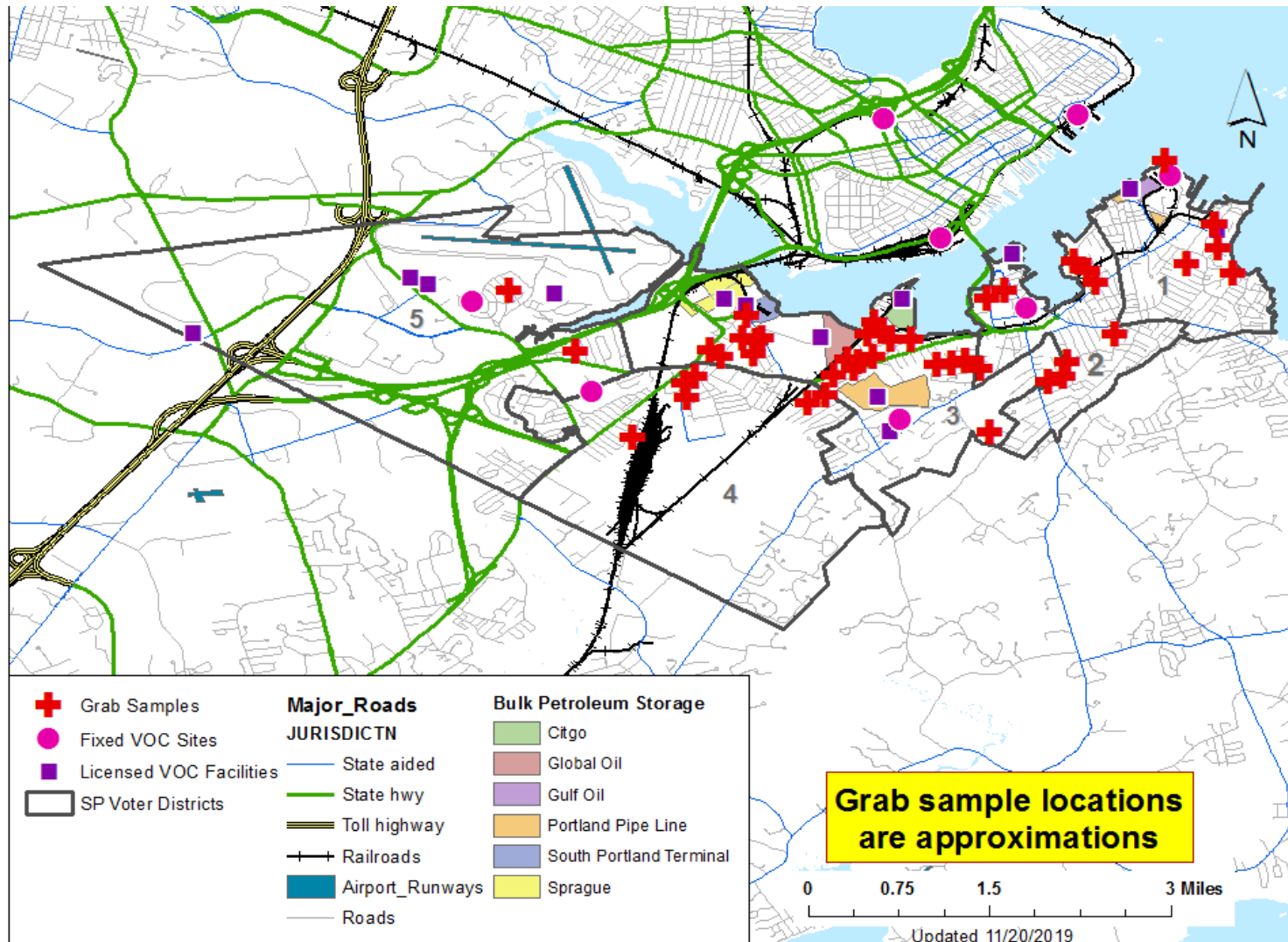


Purposes of Grab Sampling Effort

- Opportunity for citizens to become involved
- A means of correlating odor incidents as observed by the public with VOC data
- Can help to inform the adequacy of the initial 24-hour site locations and potentially any “hot spots”
- Grab sample data is not appropriate to use for any comparison to longer term average levels, guidelines or standards for health assessments

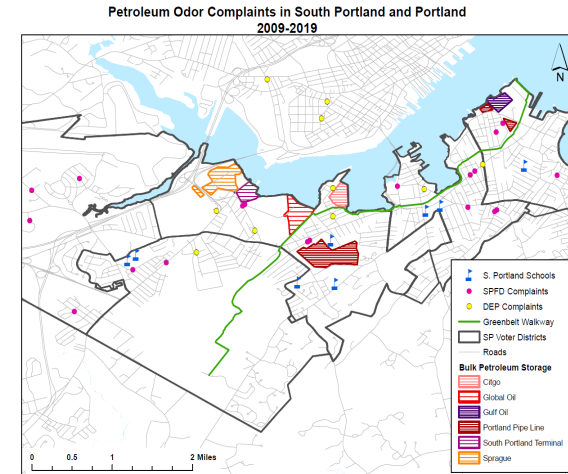


Map of All Grab Sampling Locations

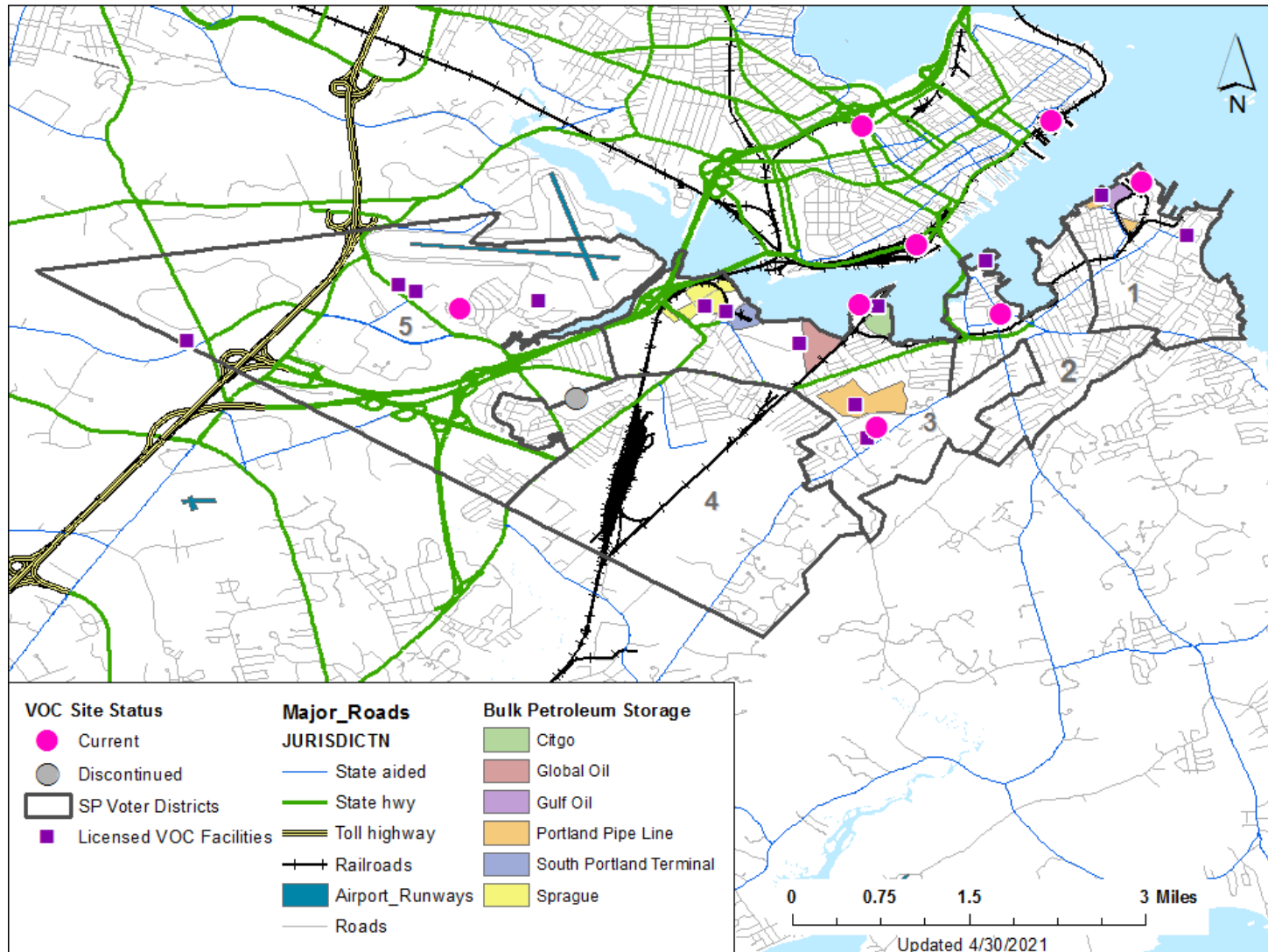


Phase 2: Fixed 24-Hour Sampling - Ongoing

- 5 sites established and operating in South Portland (one per district)
- 2 sites established and operating in Portland (along with existing long-term Deering Oaks site)
- Sites are collecting samples every 6 days (SIP calendar schedule)
- DEP will continue to operate this 8-site network for an additional full year (November 2022)
- Samples analyzed by DEP Air Lab
- Data shared with Maine CDC and posted to DEP website on a monthly basis



Map of 24-hour Sampling Site Locations



SoPo/Po Project Website

<https://www.maine.gov/dep/air/monitoring/spo-voc-monitor.html>

Maine.gov Agencies | Online Services | Help | Search Maine.gov Select Language

MAINE DEPARTMENT OF Environmental Protection Contact Us | How Do I | Sitemap

Search DEP

About Air Quality Land Resources Spills & Site Cleanup Sustainability Waste Management Water Quality

Home → Air Quality → Monitoring and Reporting → South Portland VOC Monitoring

Contacts
Permits, Licenses, Certifications
Monitoring and Reporting
Rules
Programs
Laws
Publications and Resources

South Portland/Portland VOC Air Quality Monitoring Project

At the request of South Portland City officials, DEP staff attended an April 16, 2019 City Council public workshop focused on citizen concerns about odors and air emissions coming from petroleum product storage facilities in the city. One topic that was repeatedly expressed by the residents who spoke, was the very strong desire for air quality monitoring to be conducted within the City's boundaries, since none had been done since the early 2000s. DEP made a commitment at the workshop that it would work with the City to accomplish that goal. On August 28, 2019, officials from the City of Portland formally communicated identical air quality concerns of their citizens about the same VOC sources in South Portland. Since then, Air Bureau staff have collaborated with officials from both cities and other local partners to plan an ambient air quality monitoring project, where the monitoring objective is to collect data that will help answer the question "Is the air safe to breathe?"

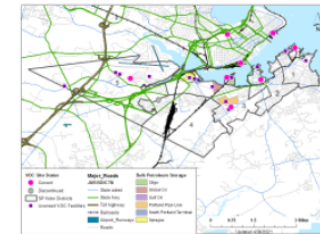
The initial focus of the monitoring project is to measure Volatile Organic Compounds (VOCs), since they constitute a large majority of the compounds associated with the types of odors being reported, as well as air emissions that come from the facilities of concern. VOCs were also chosen because making that type of measurement is something that the Air Bureau air monitoring program is already set-up to do (and is doing) and capable of supporting.

Phases 1 & 2

In calendar year 2019, the project consisted of two phases: 1) an early "grab sampling" effort in South Portland, and 2) a network of eight fixed 24-hour sampling sites (five in South Portland and three in Portland). The grab sampling phase was launched on June 10 and concluded on September 15. As of November 1, all planned 24-hour sampling sites were established and are currently taking samples on a frequency of every-6-days. The sites in South Portland were placed so that each of the five districts had a site at a municipally owned/operated facility.

Phase 3

During calendar year 2020, the implementation of phase 3 began, which includes the addition of a meteorological (met.) monitoring system at each of the fixed 24-hour sampling sites, as well as the deployment of a portable sampling platform (PSP). The process of the met. system installations is still in progress, with the first two sites coming online in June, at the South



Licensed VOC Sources and 24-hour Sampling Site Locations
[Click to view larger](#)



SoPo/Po Project Website

<https://www.maine.gov/dep/air/monitoring/spo-voc-monitor.html>

Phase 4

Maine DEP agreed that, after at least a year of data had been collected in the South Portland – Portland VOC network the location of sites would be reevaluated. South Portland has proposed some changes. Maine DEP and the City remain in discussions at this time. The site list below will be updated as new sites begin to measure VOCs and more information will be provided here when all new sites for Phase 4 have been agreed upon.

24-hour sampling site locations and status

Phase 2 - Continued Operation

- South Portland: [Bug Light Park](#) (first sample 8/13/2019)
- South Portland: [City Assessors Office](#) (first sample 6/26/2019)
- South Portland: [South Portland High School](#) (first sample 7/2/2019)
- South Portland: [Redbank Community Center](#) (first sample 10/6/2019)
- Portland: [Ocean Gateway](#) (first sample 11/5/2019)
- Portland: [West Commercial Street](#) (first sample 11/5/2019)
- Portland: [Deering Oaks](#) (first sample 3/14/2009)

Phase 3

- [Portable sampling platform](#) (first sample 8/25/2020)

Phase 4

- South Portland: [Mechanic Street](#) (first sample 3/23/2021)

Discontinued Sites

- South Portland: [School Administration Building](#) (first sample 9/30/2019; last sample 3/17/2021)

[DEP Presentation given at City Council at August 20, 2019 meeting.](#)

[DEP Presentation given at City Council at November 26, 2019 meeting.](#)

[Legislative Briefing: Emissions from Bulk Petroleum Storage Facilities.](#)

[Canister sampling results](#)

Credits

Popular Pages

Connect with Us

Other Links

Contact Information

Phase 3: Portable Sampling Platform (PSP), Meteorology & PAH Monitoring - Underway

- Citizens volunteered the use of their property and electrical power
- PSP has been deployed at 7 residential locations to date
- PSP typically collected samples on the same days as the other sites (SIP calendar schedule)
- Meteorological sensors units now operational at 5 fixed 24-hour sites
- 2 PAH samplers deployed at existing sites: Mechanic St. & PSP locations



Phase 4: Project Reevaluation – Fall 2022

- Review and assessment of sample results and their Ambient Air Guideline (AAG) values
- Review & assessment of monitoring network (number & location of sites, sampling frequency, other pollutants)
 - Feb. 9, 2021: Received SoPo/CAAC recommended site relocations request
 - Feb. 24, 2021: SoPo/Po Stakeholders Meeting
 - Mar. 17 / 23: SPCR ends / SPMS begins
 - Apr. 19, 2021: Sent reply to SoPo City Manager responding to site relocations request
 - Jan. 2022: Clean Air Advisory Committee (CAAC) re-established
 - Apr. 14, 2022: Project updates to the CAAC by Maine DEP and CDC



Mechanic Street Site



Collaborating with Our Maine CDC Colleagues

Update on Health Assessment of VOC Monitoring Results for Portland – South Portland

Andrew Smith, S.M., Sc.D.

State Toxicologist

Maine CDC

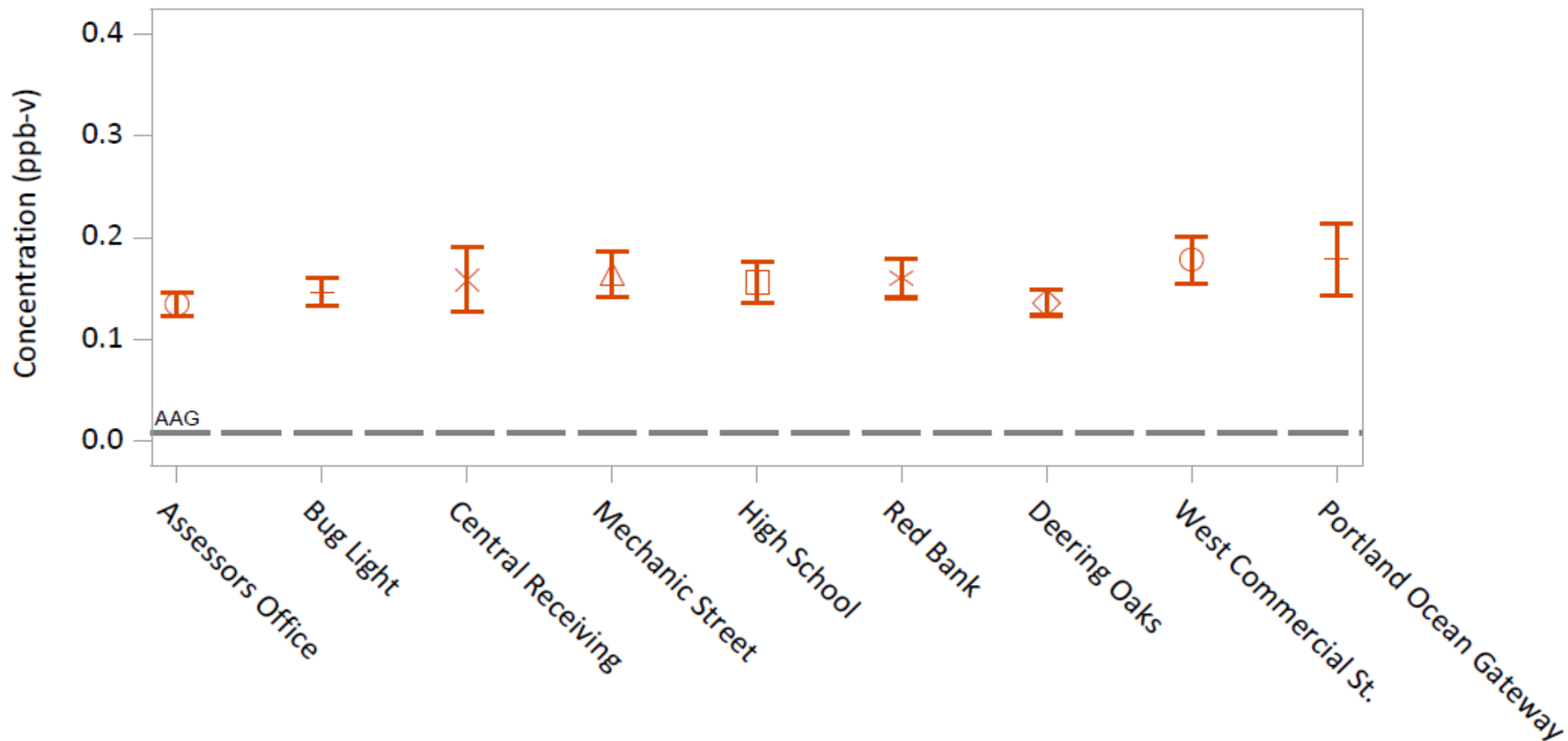
April 14, 2022



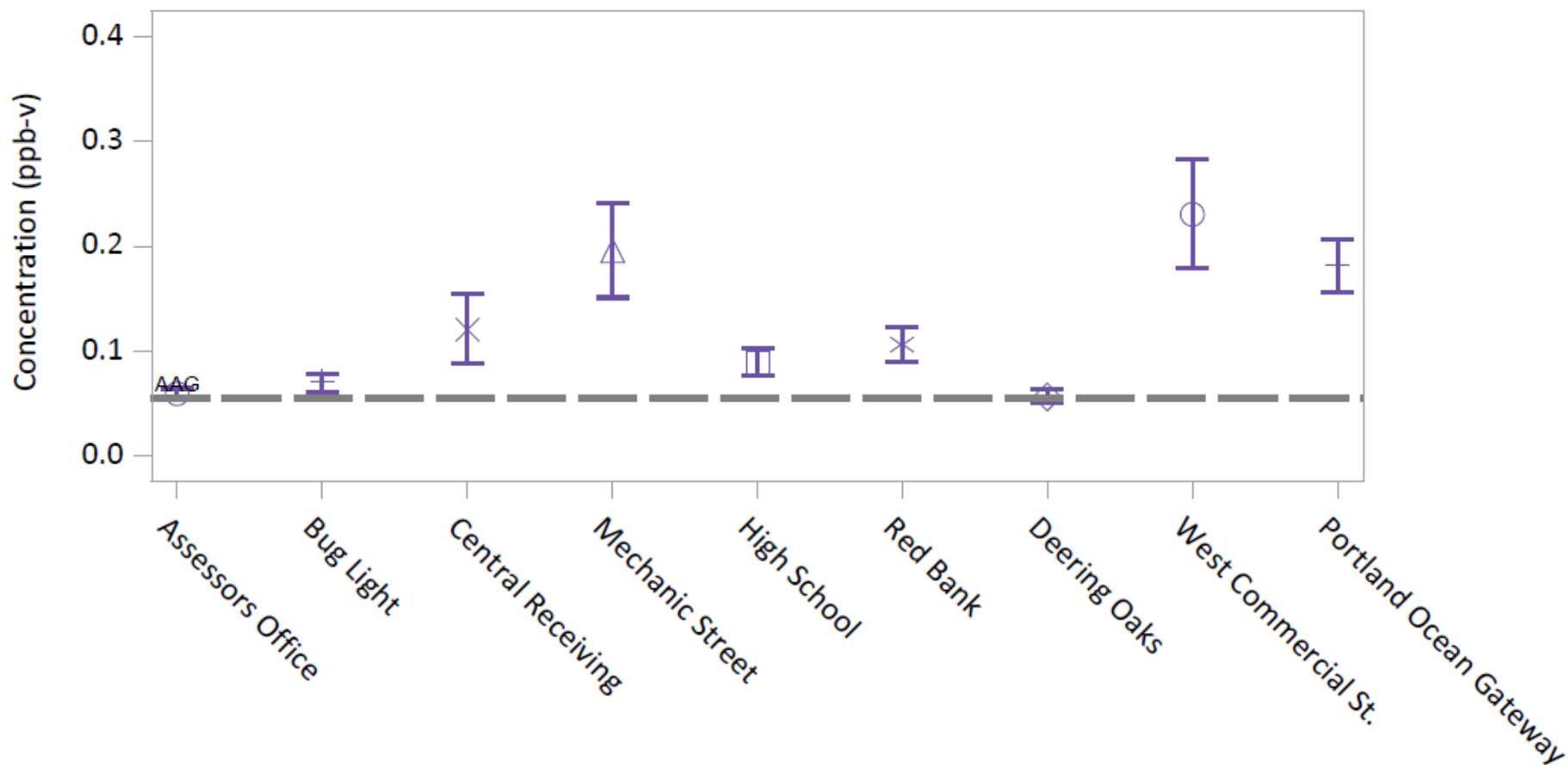
Included data through November 2021



Acrolein: average 24-hour sampling results with 95% confidence interval by site (thru Dec 2021)



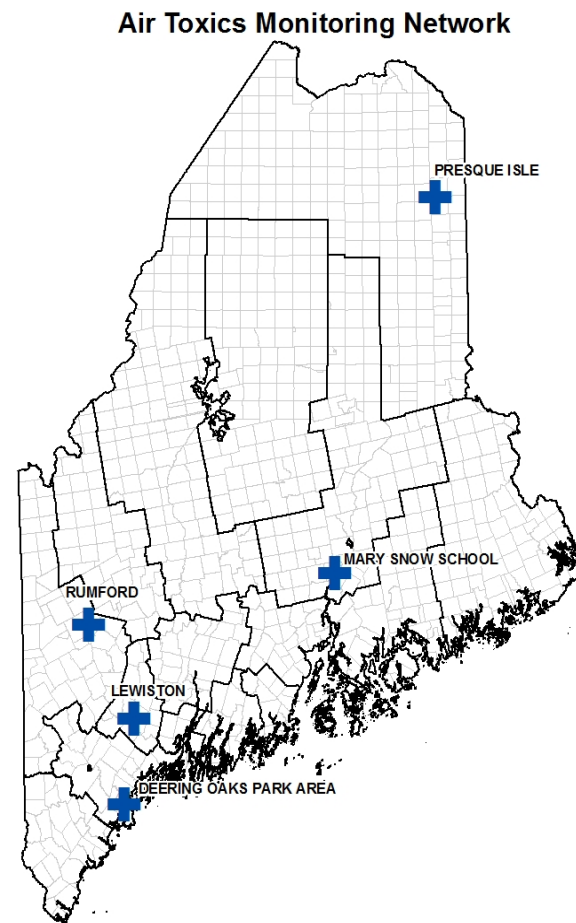
Naphthalene: average 24-hour sampling results with 95% confidence interval by site (thru Dec 2021)



Quantifying the Effort to Date

(as of December 31, 2021)

- The 7 new VOC air monitoring sites in South Portland/Portland exceed the number of other VOC sites (5) operating across the State
- 9 canister sampling systems = ~\$20,000
 - Includes “portable” and backup/spare systems
- 48 canisters = ~\$31,200
- 9 meteorological sensors units = ~\$18,000
- Analytical costs = ~\$685,290 (based on EPA contract price of \$530 per sample)
- Total to date ~\$754,490
- Stakeholders’ contributions \$30,000
- In-kind staff time to plan and implement project – “priceless”!



Next Steps: Air Monitoring

- Pursue further dialog with SoPo city officials to reach consensus on their proposed relocation of some of the existing fixed sites
- Continue to install and operate meteorological sensors units at all 24-hour canister sampling sites
- Further deployment of the portable sampling system will depend on identifying a non-DEP individual to take on that responsibility
- Explore other pollutant categories/methods to measure (e.g. particulate matter, PAHs, hydrogen sulfides, continuous VOC monitors)
- Re-establish canister sampling at Two Lights State Park
- Continue to share findings and provide periodic updates and reports to the City, and upon request.
- Continue to do further assessments of all sample data and work with Maine CDC on interpreting findings
- Investigate other potential avenues for acquiring additional resources



Next Steps: DEP-BAQ

- Adopt Chapter 170: Degassing of Petroleum Storage Tanks, Marine Vessels, and Transport Vessels. This proposed rule establishes requirements to minimize emissions from the degassing of certain petroleum storage tanks, marine vessels, and transport vessels.
- Adopt Chapter 171: Control of Petroleum Storage Facilities. This proposed rule establishes new control, operating, inspection, testing, monitoring, recordkeeping, and reporting requirements for petroleum storage facilities throughout the state, in accordance with the requirements outlined by the legislature
- Evaluate effectiveness of mist eliminators and carbon adsorption odor control equipment in reducing VOC emissions. If technology is proven effective, require as Best Practical Treatment to control VOC emissions from heated petroleum storage tanks.
- Implement other terminal initiatives through the air licensing process





Contact:

Andrew Johnson
Andy.Johnson@maine.gov
(207) 480-0906

www.maine.gov/dep

