Lebanon's CSO Program

20 Years in the Making

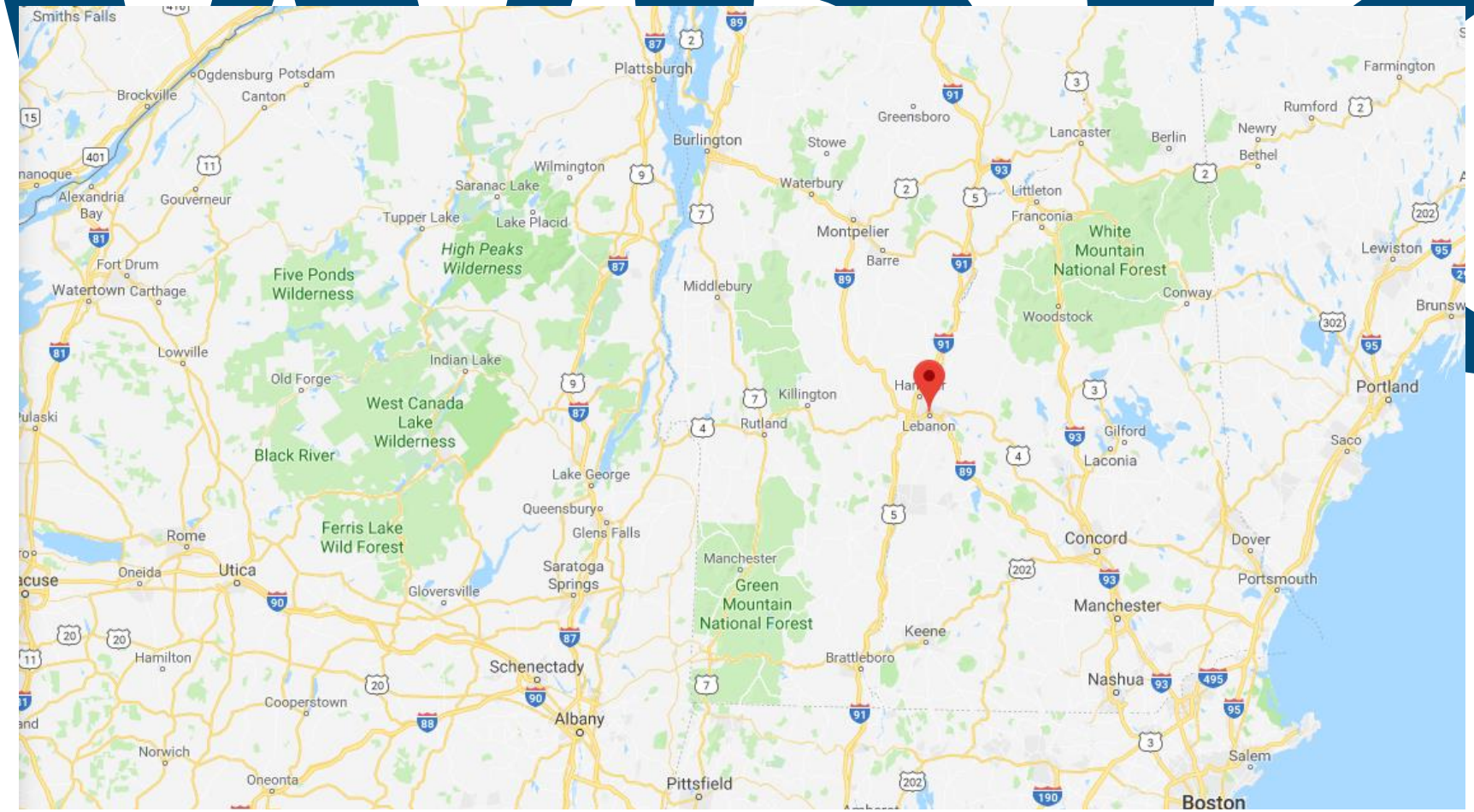
January 2022

Ryan Wingard, PE

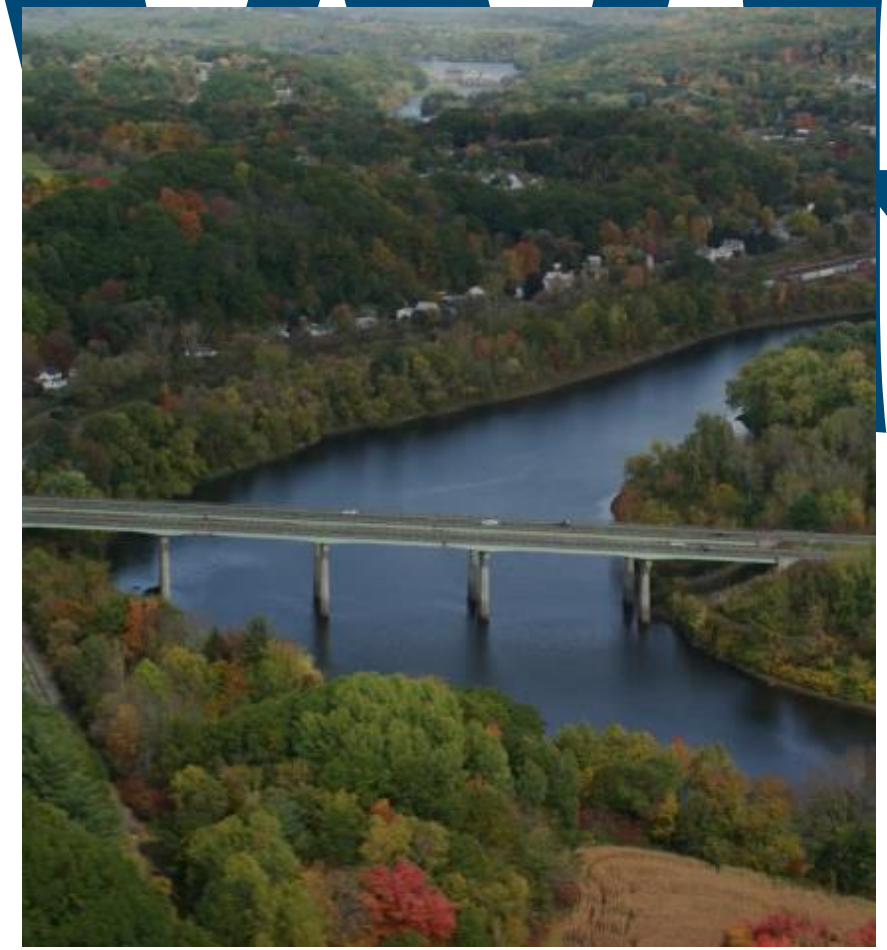
esentation Overview

- Introduction to the City
- Collection System Circa 1998
- CSO Program History
- Consent Decree
- Sewer Separation
- Public Education/Policy
- Stormwater Treatment
- Program Success
- Q&A Discussions

ro to City – eneral



- Grafton County, NH
- Chartered 1761
- Lebanon and West Lebanon
- Population ≈ 14,000
- 9th Largest City in NH
- 41.4 square miles
  - 97.6% land
  - 2.4% water
- Combined Sewer System



Connecticut River Not 303(d) Listed

303(d) Listed Rivers

- Mascoma River
  - 1.4 Miles
  - Aluminum Impairment
  - Low TMDL Priority
- Hardy Hill Brook
  - 11.3 Miles
  - Aluminum and Lead Impairment
  - Low TMDL Priority
- Blodgett Brook
  - 4.7 Miles
  - pH Impairment
  - Low TMDL Priority

What was happening in 1998

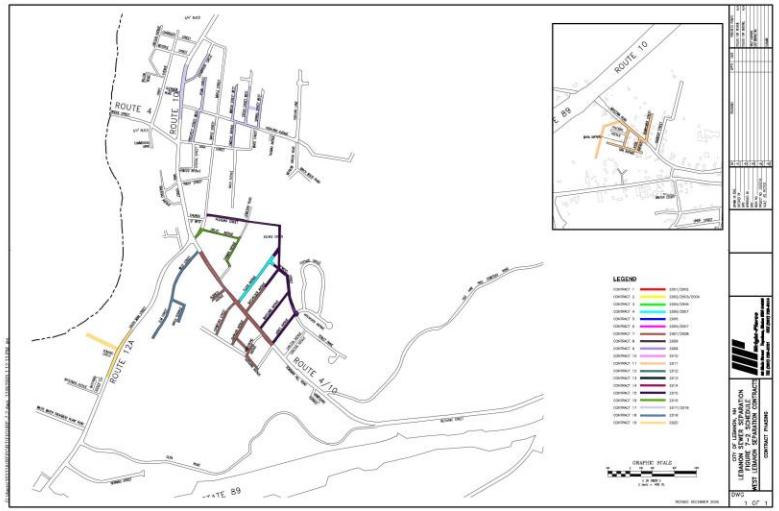
President of the US	Bill Clinton
Major Company Founded	Google
World Cup Winner	(in France)
Gallon of Gas	$1.15
Loaf of Bread	$1.26
Emmy for Outstanding Comedy Series	Frasier
Oscar for Best Picture	Titanic
Head Coach	Pete Carroll
Quarterback	Drew Bledsoe

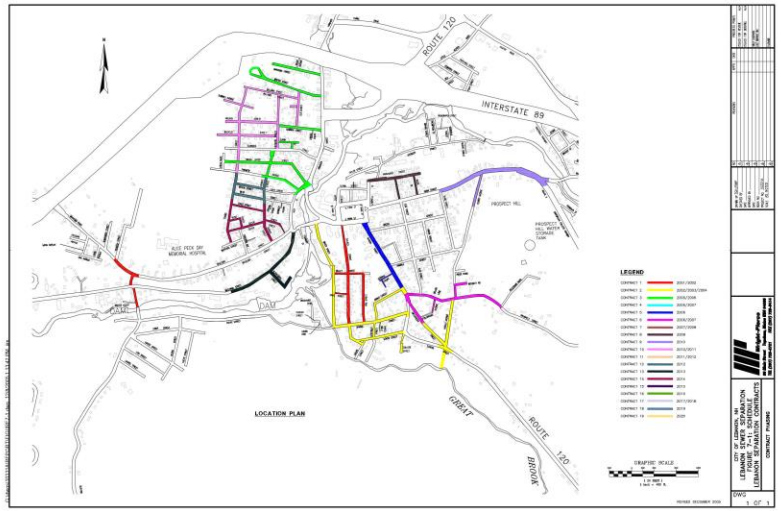
Lebanon Collection System Circa 1998

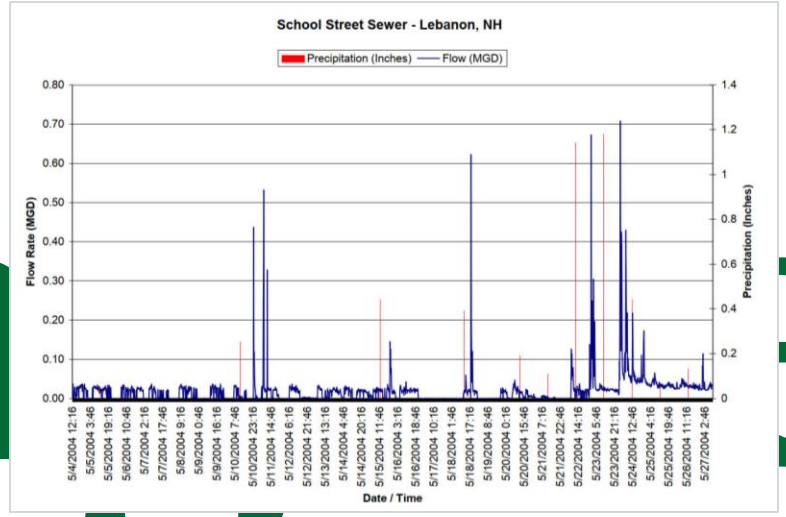
- Miles of Total Sewers/Interceptors = 38
- Miles of Storm Drainage = 14
- Miles of Combined Sewer = 15.2 (40%)
- Number of Combined Catch Basins = 350
- Number of CSO Outfalls = 7
- Number of CSO Discharges per Year = 78
- Volume of CSO Discharged per Year = 2 – 13 MG
- WWTP Average Daily Flow = 1.94 MGD

2005 CSO Study

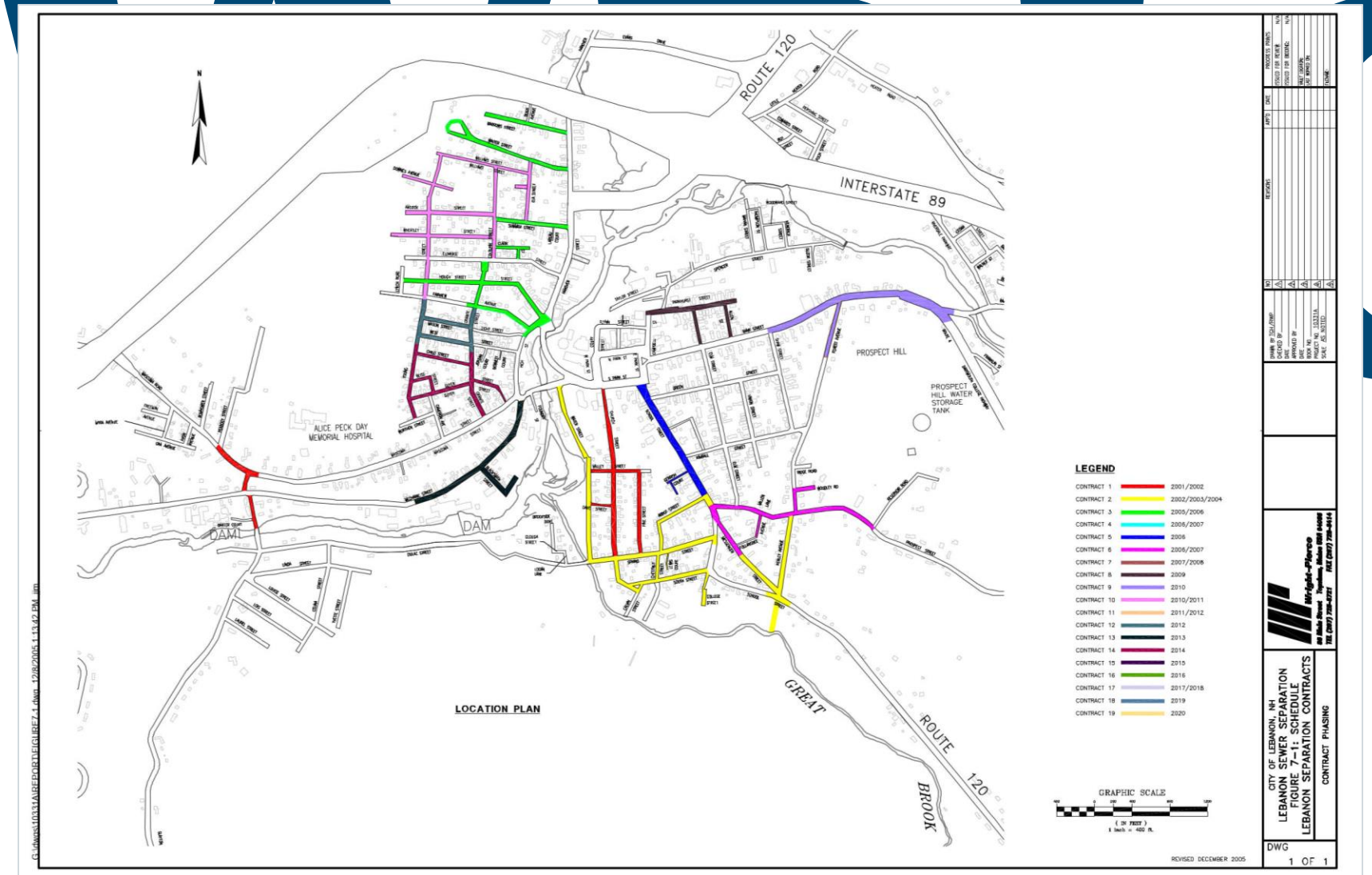
- In-System Flow Monitoring
- Plant Flow Analysis
- Interceptor Capacity Analysis (SWMM)
- Field Investigations (Smoke/Dye Testing)
- Sewer Separation Project Area Prioritization





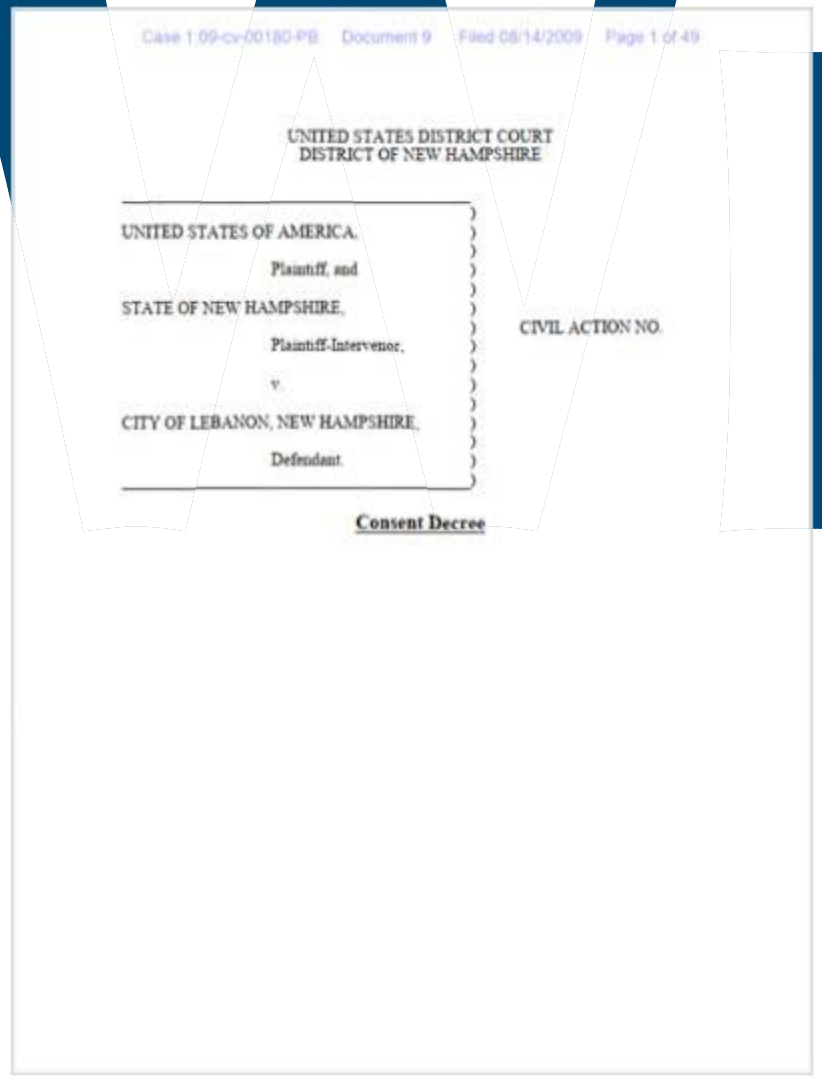


05 CSO Study – Sewer Separation Projects



- 19 Phases
- Start 2001
- End 2020

Consent Decree Schedule



Case 1:09-cv-00180-PB Document 9 Filed 08/14/2009 Page 1 of 49

UNITED STATES DISTRICT COURT
DISTRICT OF NEW HAMPSHIRE

UNITED STATES OF AMERICA,
Plaintiff, and
STATE OF NEW HAMPSHIRE,
Plaintiff-Intervenor,
v.
CITY OF LEBANON, NEW HAMPSHIRE,
Defendant

CIVIL ACTION NO.

Consent Decree

- September 2009 – Monitoring Plan
- May 2010 – CMOM Plan
- November 2010 – PCMP
- November 2011 – IDDE Plan
- November 2011 – Separate CSO #22/10
- November 2015 – Separate CSO #24
- November 2018 – Separate CSO #23/ZZ
- November 2021 – Separate CSO #26*
- December 2021 – All CSOs Eliminated*

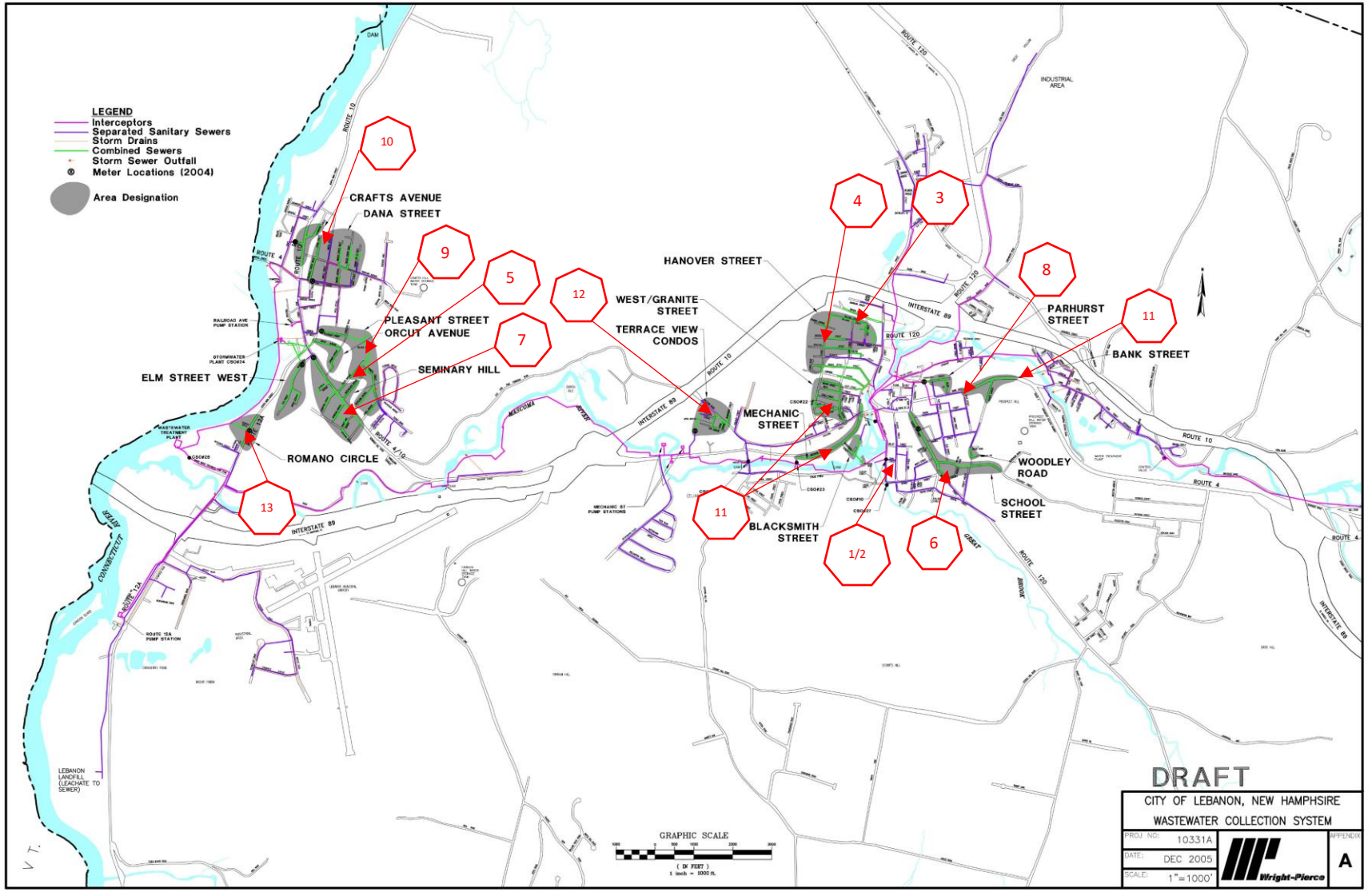
CMOM = Capacity, Management, Operations, and Maintenance

PCMP = Post Construction Monitoring Plan

IDDE = Illicit Discharge Detection and Elimination

* EPA/DES granted extension beyond original December 2020 date.

wer S ration rojects



Contract	Design Year	Sewer (ft)	Storm (ft)	Water (ft)	Roadway (ft)	Catch Basins Removed	Construction Cost	Construction Cost per LF Roadway
C1	2003	3,900	5,045	3,550	4,600	15	$1,994,928	$434
C2	2002	5,690	6,323	4,195	6,700	20	$3,568,611	$533
C3	2007	5,415	7,105	7,020	6,750	20	$4,300,000	$637
C4	2009	5,100	5,000	6,500	6,700	25	$3,577,721	$534
C5	2007	1,250	740	1,460	1,600	10	$607,587	$380
C6	2009	4,460	5,290	1,420	5,150	25	$2,986,925	$580
C7	2009	8,800	8,725	9,300	8,400	26	$6,382,906	$760
C8	2011	6,480	7,050	6,570	5,600	20	$4,805,583	$858
C9	2012	5,880	7,300	6,740	6,000	20	$4,736,126	$789
C10	2014	4,360	6,780	4,830	5,800	25	$4,288,260	$739
C11	2016	12,540	15,670	14,480	18,250	50	$19,973,175	$1,094
C12	2019	6,150	6,150	6,150	6,150	10	$5,900,000	$959
C13	2021	1,800	2,500	1,500	2,000	8	$2,940,000	$1,470
Total	Feet	71,825	83,678	73,715	83,700	274	$66,061,822	$789
Total	Miles	13.6	15.8	14.0	15.8			

wer S ration Sample Project Process

- Sewer Smoke Testing – June 2019
- Project Field Work – December 2019
- House-To-House Inspections – January 2020
- CCTV Sewer Inspection – January 2020
- Virtual Walkabouts– January 2020 – PUBLIC MEETING
- Preliminary Design – January 2020
- 75% Design – May 5, 2020 – PUBLIC MEETING
- 90% Design – November 2020 – PUBLIC MEETING
- Bidding – December 2020
- Construction – Spring 2021

Contract 13 Project Area

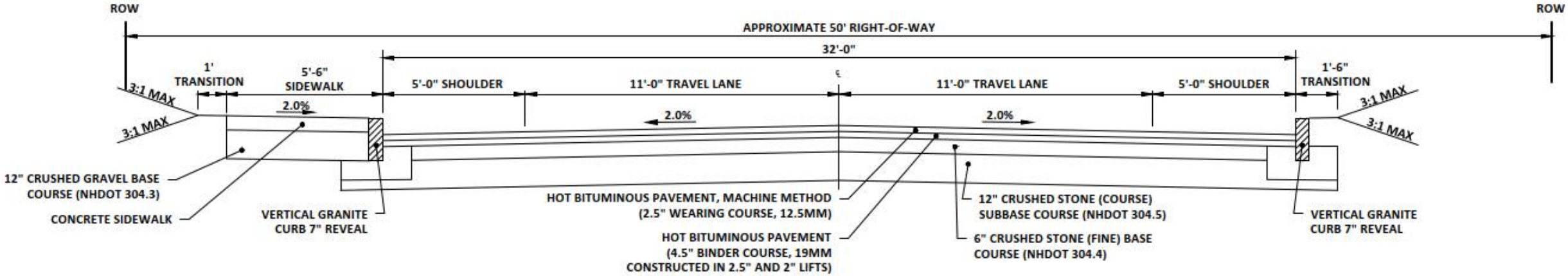
- Route 12A
- Romano Circle
- Doc Place

Route 12 South Main Street

Waterman Ave to 72 South Main Street

Component	Existing	Proposed
Width	26’ - 28’	32’
Sidewalk	Yes (west)	No change
Drainage	Curb/Ditch	Curb/CBs

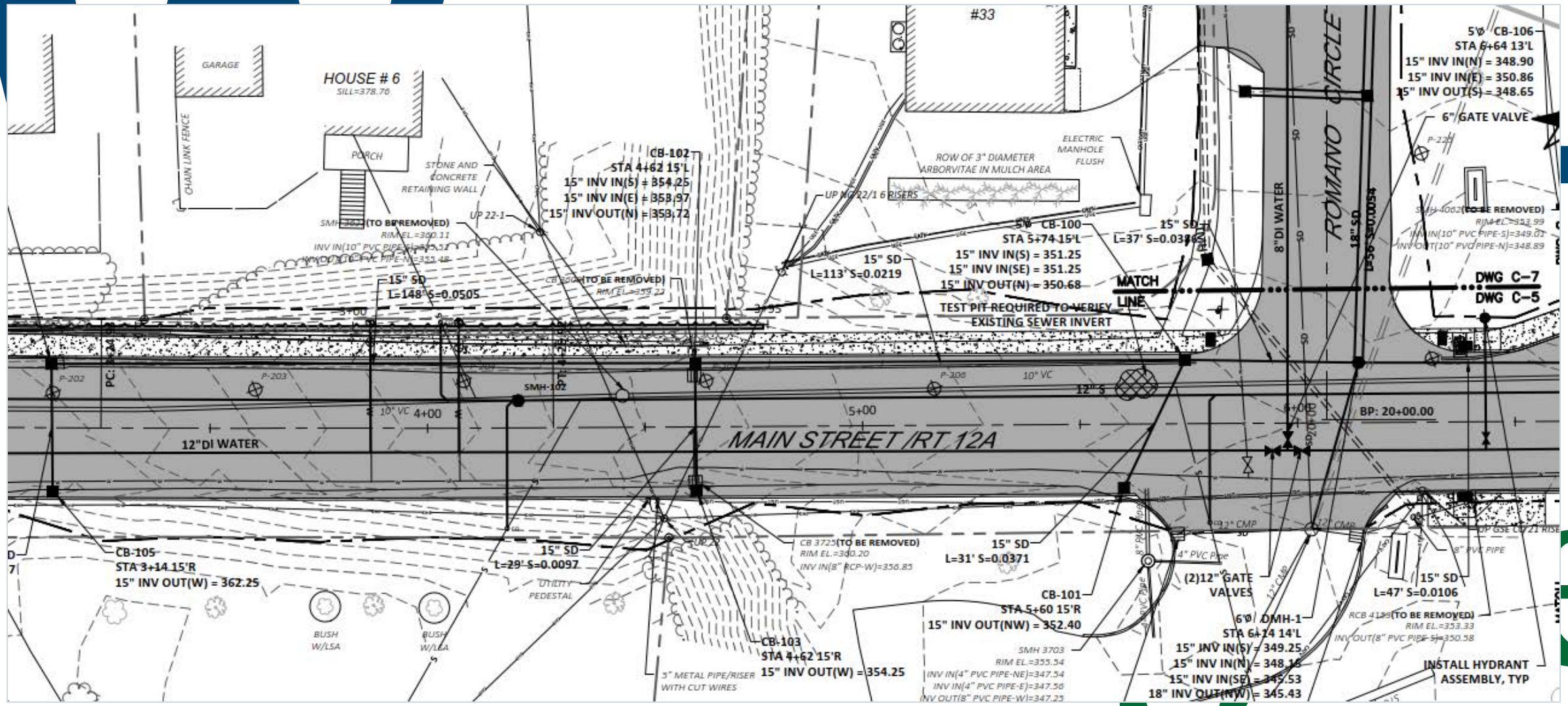
ute 1 outh ain Street



SOUTH MAIN ST STA 1+50 TO STA 2+50 AND STA 4+75 TO END

NTS

ute 1 outh ain Street



blic E ation Walkabouts

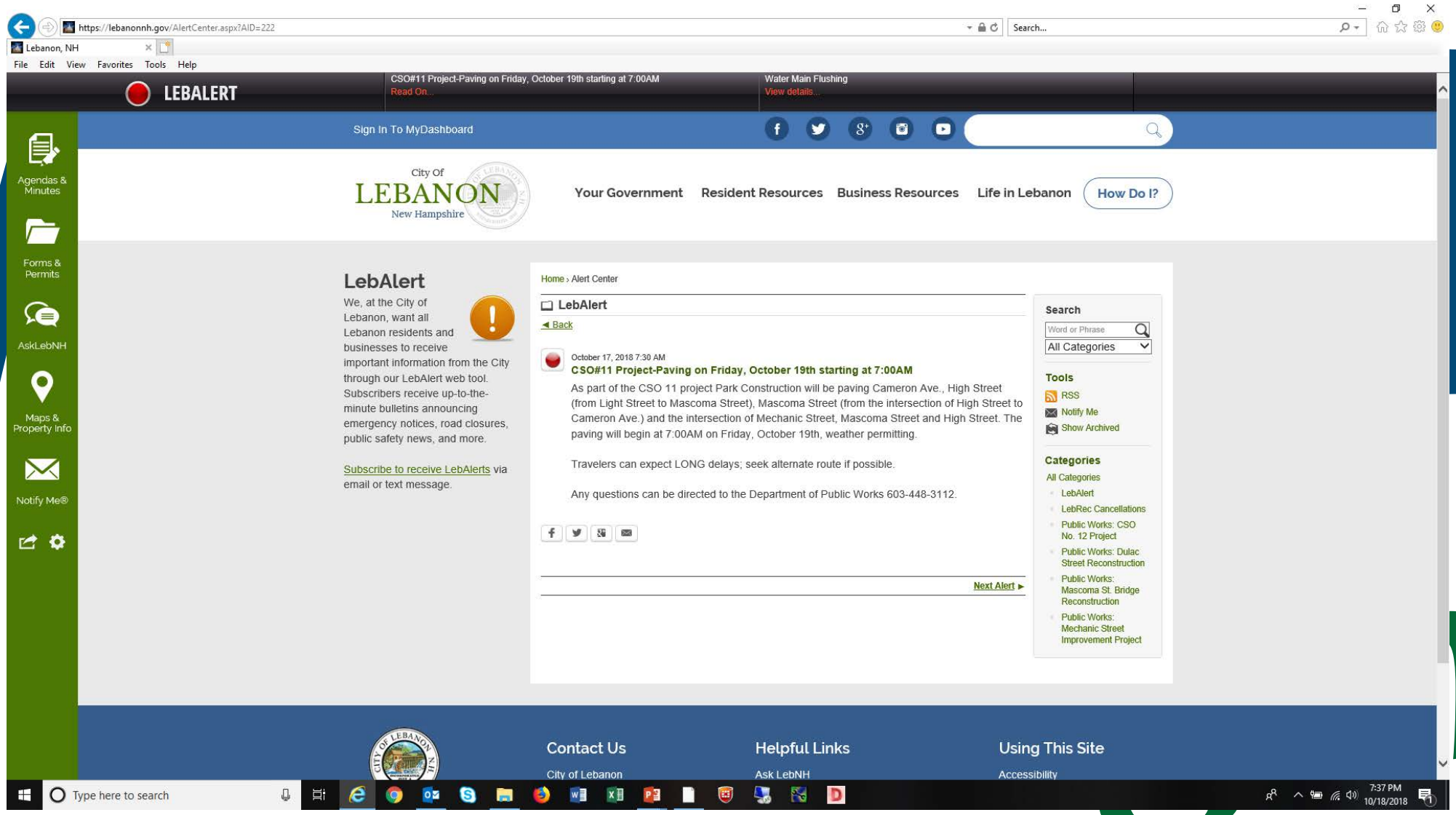
blic E ation CATV

- Review of CSO Program
- Discussion of Construction Impacts
- Q&A Session
- Recorded for Future Use

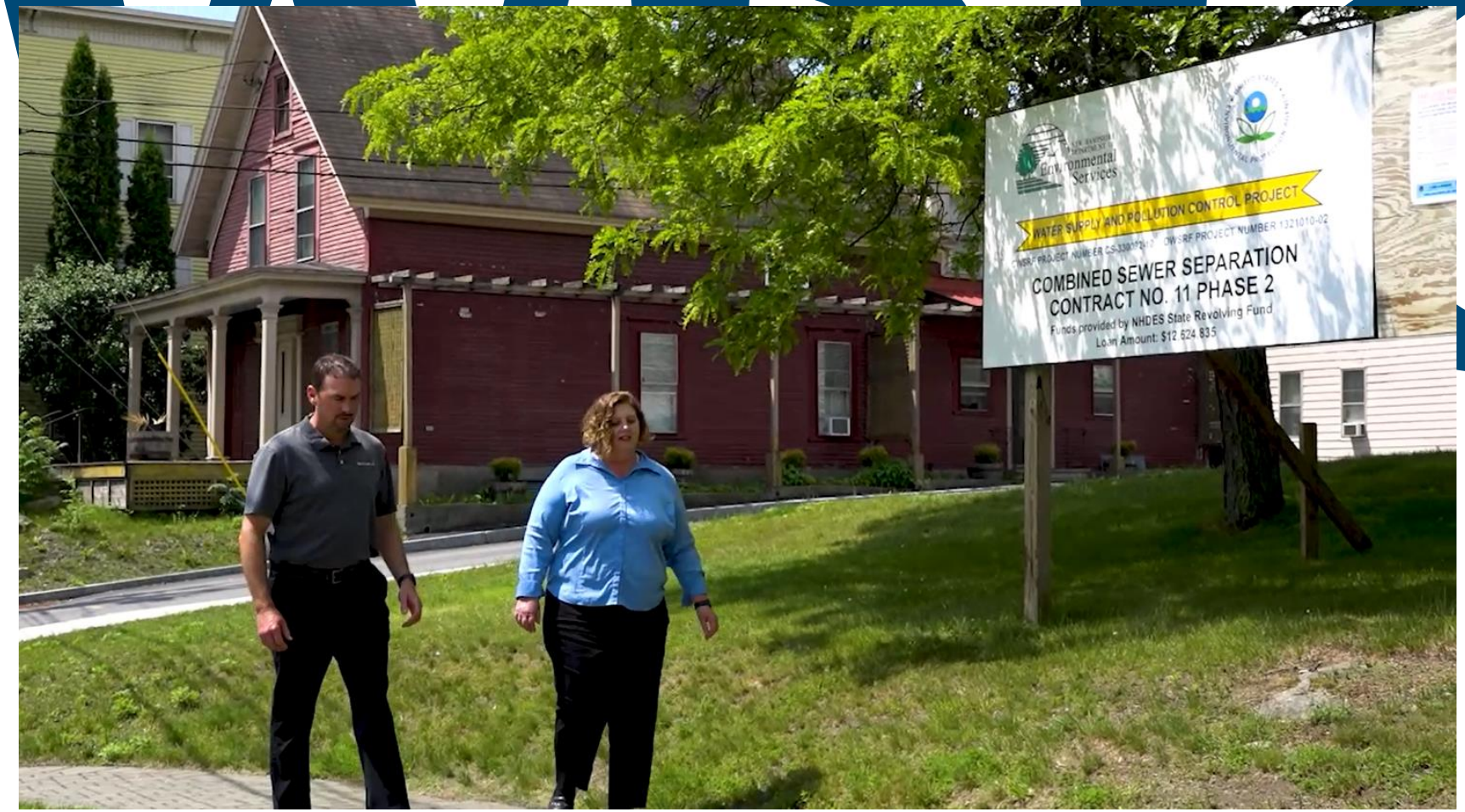
RIGH

Engine

blic E ation LEBAlert



blic E ation Informational Video



- Review of CSO Program
- Discussion of Construction Impacts
- Recorded for Use on City Website

tting ic Po y – Decision Points

- Curbing
  - Asphalt vs. Granite
- Sidewalks
  - Asphalt vs. Concrete
- Piping
  - Replace 1, 2, or 3 pipes (sewer, storm, water)
- Pavement
  - Fullwidth, trench with overlay, trench

tting ic Po y – Curbing

Asphalt vs. Granite

tting ic Po y – Sidewalk

Asphalt vs. Concrete

tting ic Po y – Piping Options

Option 1
- New storm drain
- Reuse sanitary
- No water

Option 2
- New storm drain
- New sanitary
- No water

Option 3
- New storm drain
- New sanitary
- New water

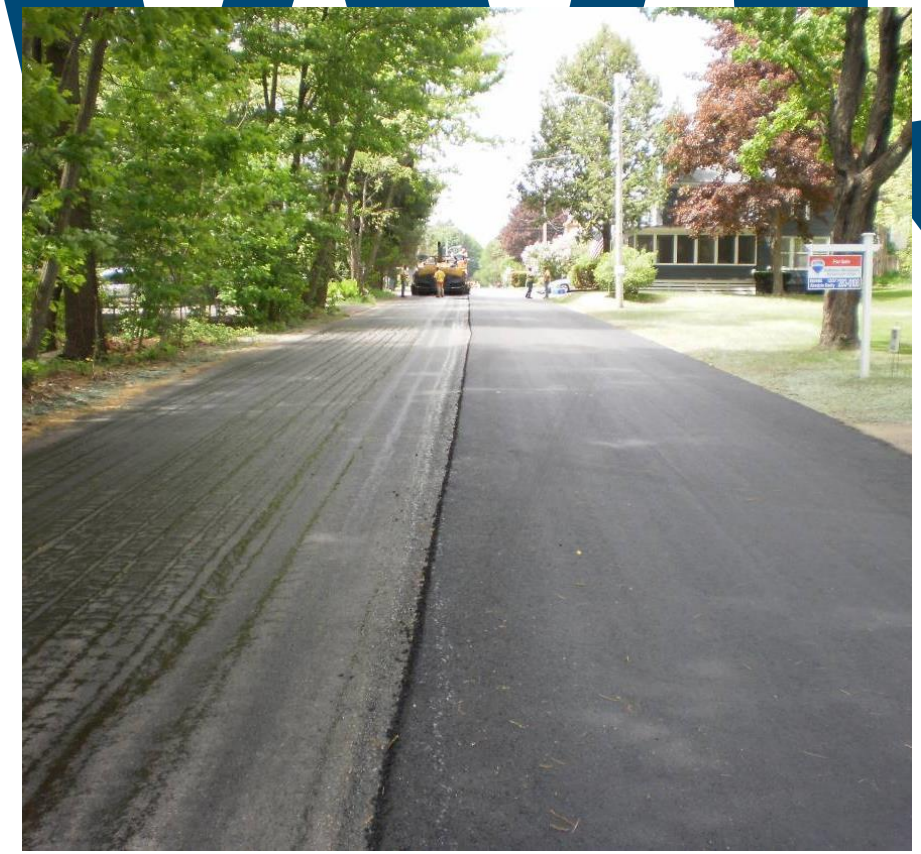
tting ic Po y – Pavement

- Trench patch without overlay
- Pipe Option 2/3

tting ic Po y – Pavement

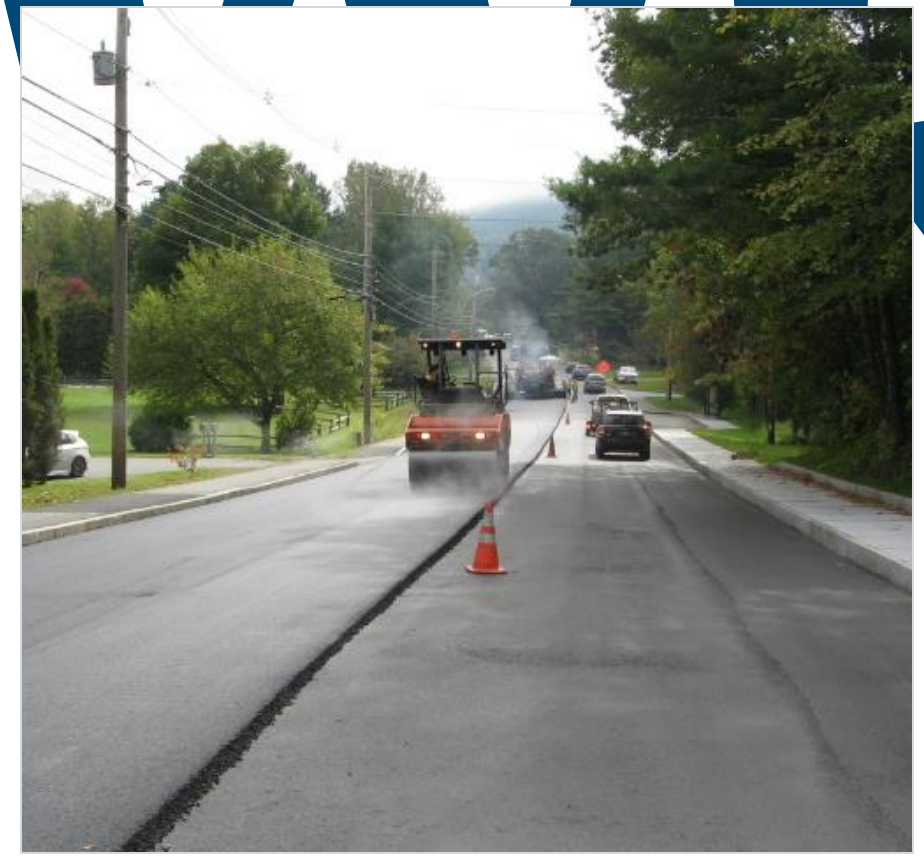
- Trench patch with full width overlay
- Pipe Option 2/3

tting ic Po y – Pavement



- Full width/depth reconstruction w/o sidewalks
- Curb-to-curb

tting ic Po y – Pavement



- Full width/depth reconstruction with sidewalks
- PL to PL

tting ic Po y – Decisions Made

- Curbing
  - Asphalt vs. Granite – Location Dependent
- Sidewalks
  - Asphalt vs. Concrete – Location Dependent
- Piping
  - 1, 2, or 3 new pipes (sewer, storm, water)
  - 3 new pipes for older neighborhoods
  - Slip line sewer when appropriate
- Pavement
  - Full width/depth, trench with overlay, or trench
  - Full width/depth with sidewalks

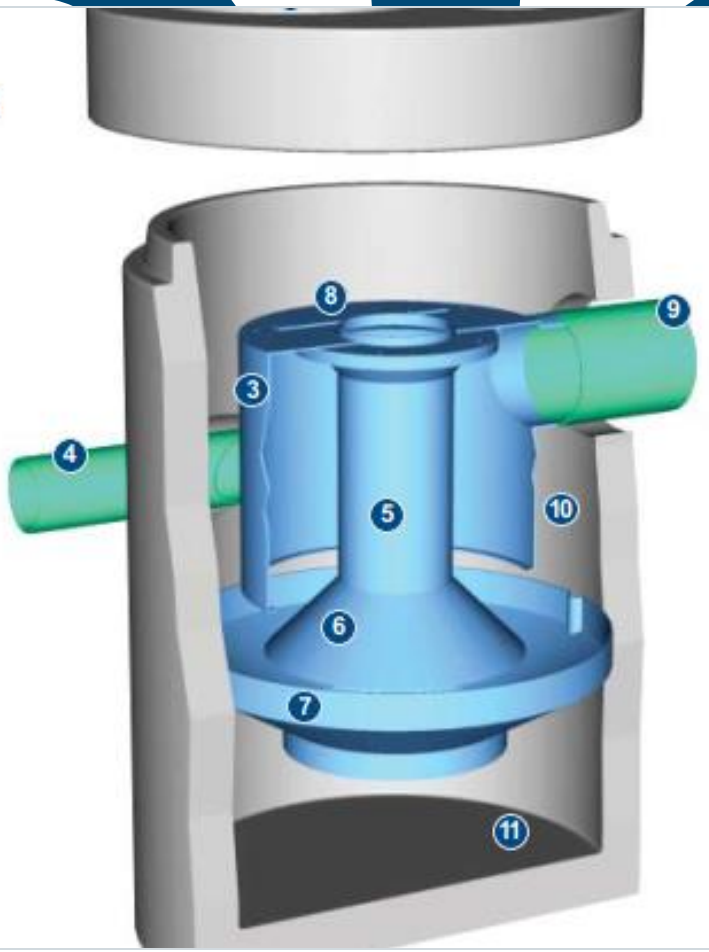
Stormwater Treatment

- Downstream Defender (Hydro International) – 4 installed
- Nutrient Separating Baffle Box (Suntree Technologies)
- BaySeparator (BaySaver Technologies)
- Porous Pavement
- Infiltration Basin
- Extended Sumps
- Catch Basin Hoods

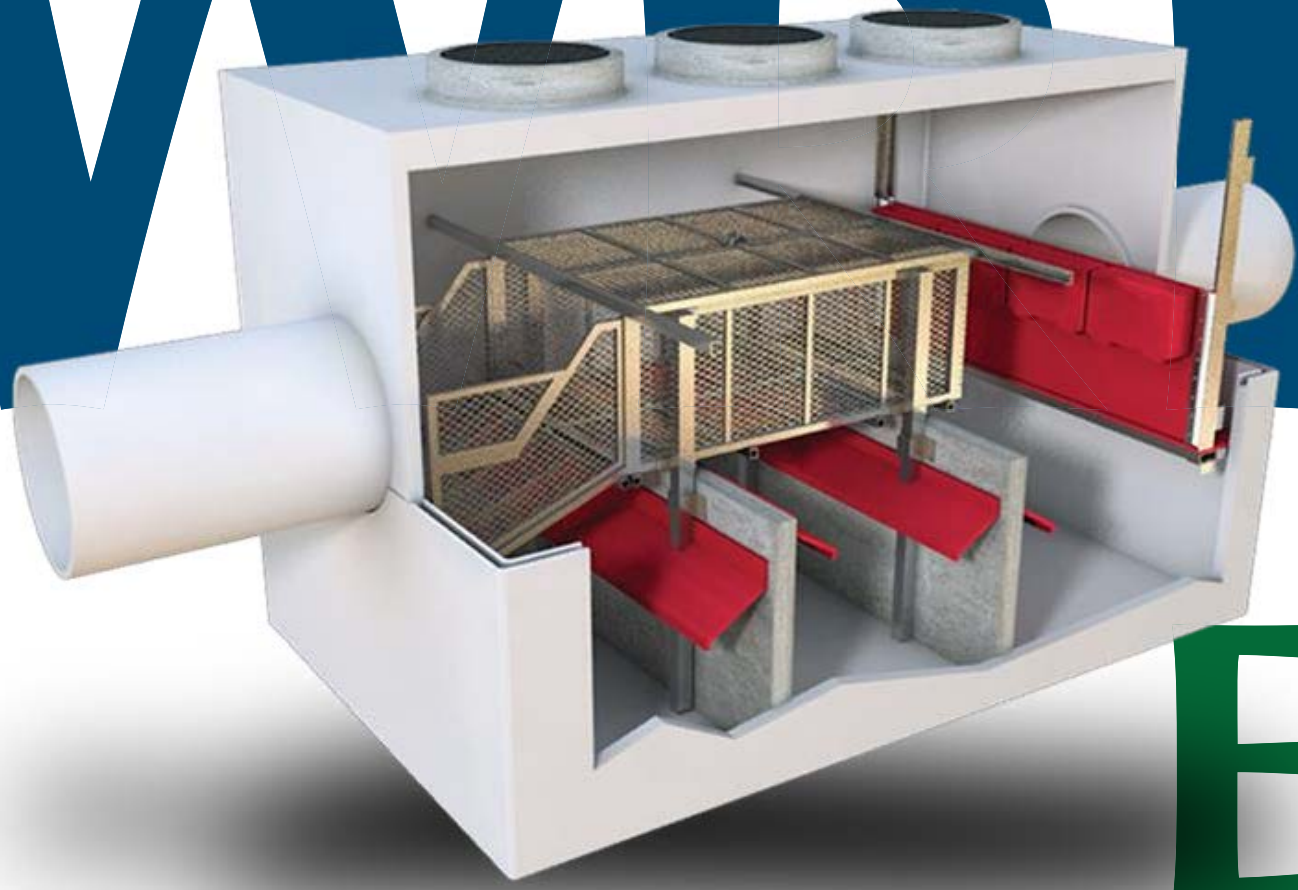
ormw Treat ent – Downstream Defender

DOWNSTREAM DEFENDER COMPONENTS

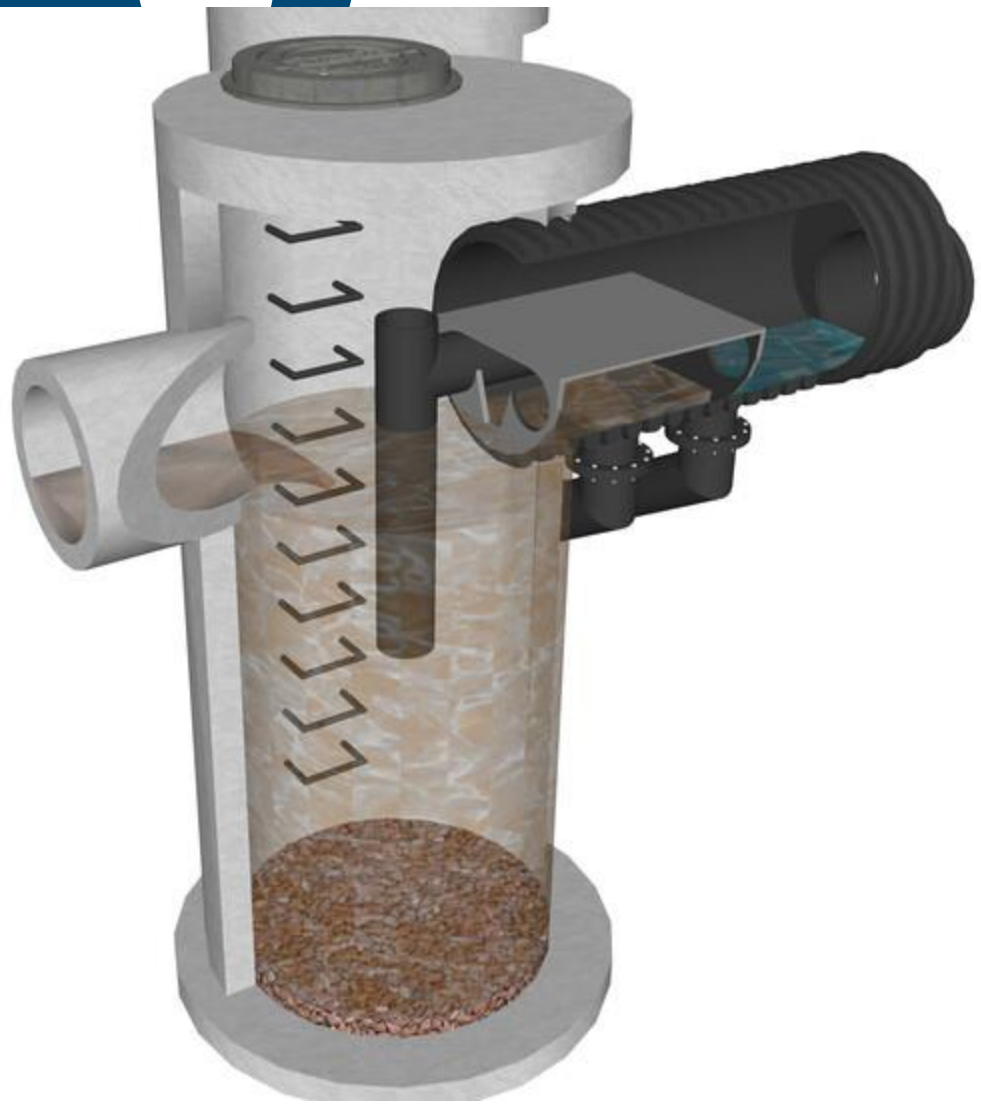
1. Central Access Port
2. Floatables Access Port (6-ft., 8-ft. and 10-ft. models only)
3. Dip Plate
4. Tangential Inlet
5. Center Shaft
6. Center Cone
7. Benching Skirt
8. Floatables Lid
9. Outlet Pipe
10. Floatables Storage
11. Isolated Sediment Storage Zone



ormw Treat ent – Nutrient Separating Baffle Box

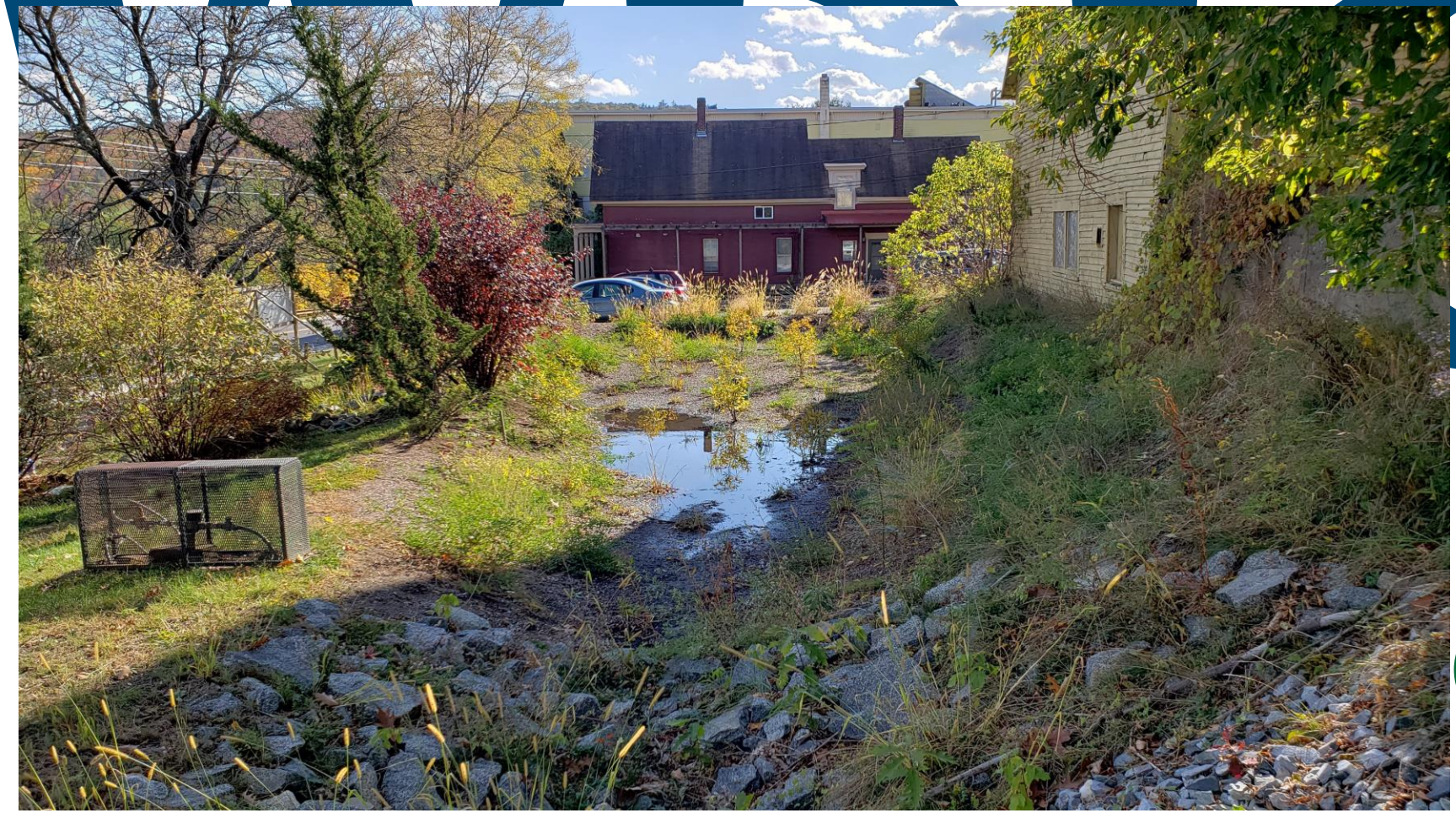


Stormwater Treatment – BaySeparator



Stormwater Treatment – Porous Pavement – Pearl Street

ormw Treat ent – Infiltration Basin – High Street



e Imp

UNITED STATES DISTRICT COURT
DISTRICT OF NEW HAMPSHIRE

UNITED STATES OF AMERICA,
Plaintiff, and
STATE OF NEW HAMPSHIRE,
Plaintiff-Intervenor,
v.
CITY OF LEBANON, NEW HAMPSHIRE,
Defendant.

CIVIL ACTION NO. 1:09-cv-00180-PB

ORDER

The *Joint Motion for Modification and Termination of Consent Decree* is hereby **GRANTED.** By Order of this Court, Section XX (Termination), Paragraph 58 of the Consent Decree, Doc. No. 9, is modified to read:

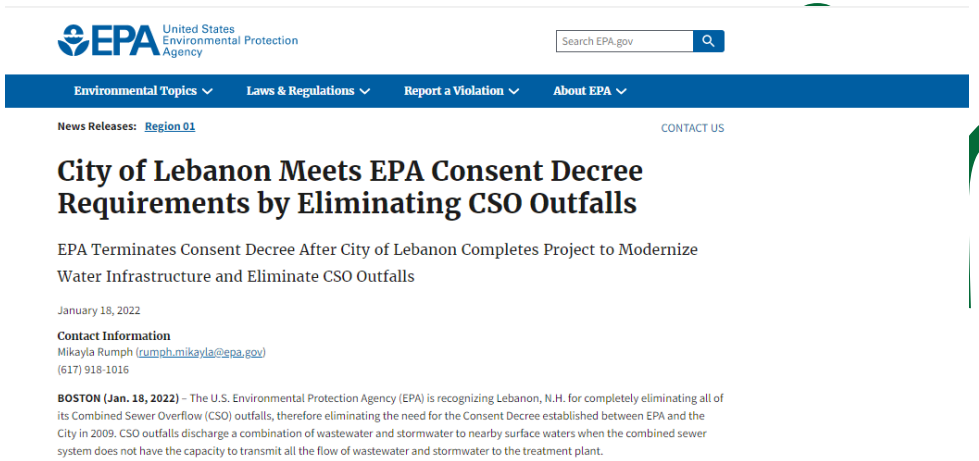
The Court shall terminate this Consent Decree upon joint motion of the Parties after the City has paid all outstanding penalties and has completed all remedial measures to meet the CSO Mitigation Objective described in Paragraph 9 required under Section VI of this Consent Decree.

Further, the Consent Decree is now terminated.

IT IS SO ORDERED.

/s/ Paul Barbadoro
UNITED STATES DISTRICT JUDGE
DISTRICT OF NEW HAMPSHIRE

- Estimated 274 Catch Basins Disconnected
- CSO Discharges Reduced by 100%
- WWTP Influent Reduced by 25%
- Revitalized Infrastructure
  - Full Depth Roadway
  - Sidewalks and Curbing
  - Water, Sewer, and Drain
- Closed All CSOs!
- Consent Decree Termination November 19, 2021!



EPA United States Environmental Protection Agency

Search EPA.gov

Environmental Topics | Laws & Regulations | Report a Violation | About EPA

News Releases: Region 01

CONTACT US

City of Lebanon Meets EPA Consent Decree Requirements by Eliminating CSO Outfalls

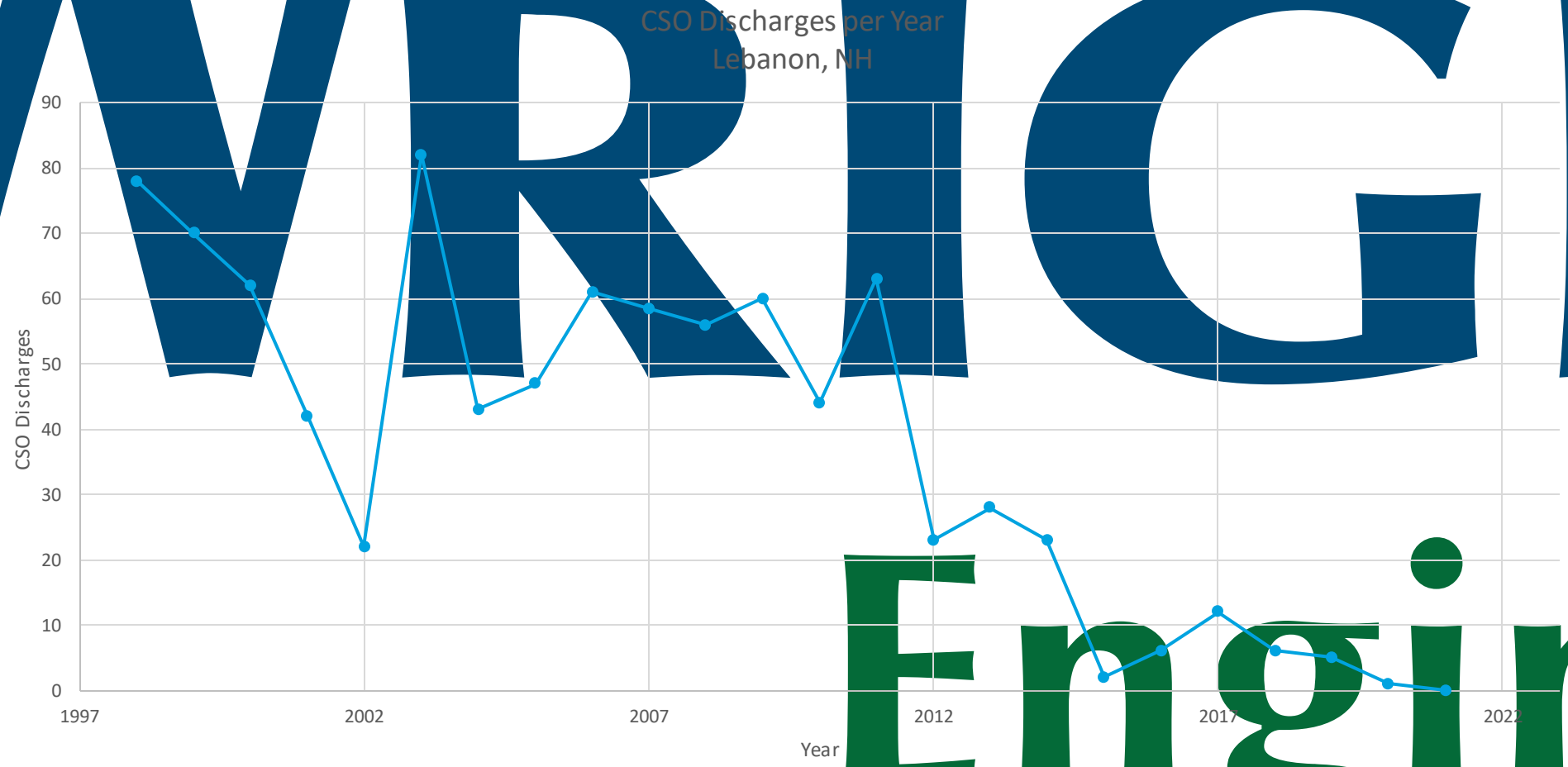
EPA Terminates Consent Decree After City of Lebanon Completes Project to Modernize Water Infrastructure and Eliminate CSO Outfalls

January 18, 2022

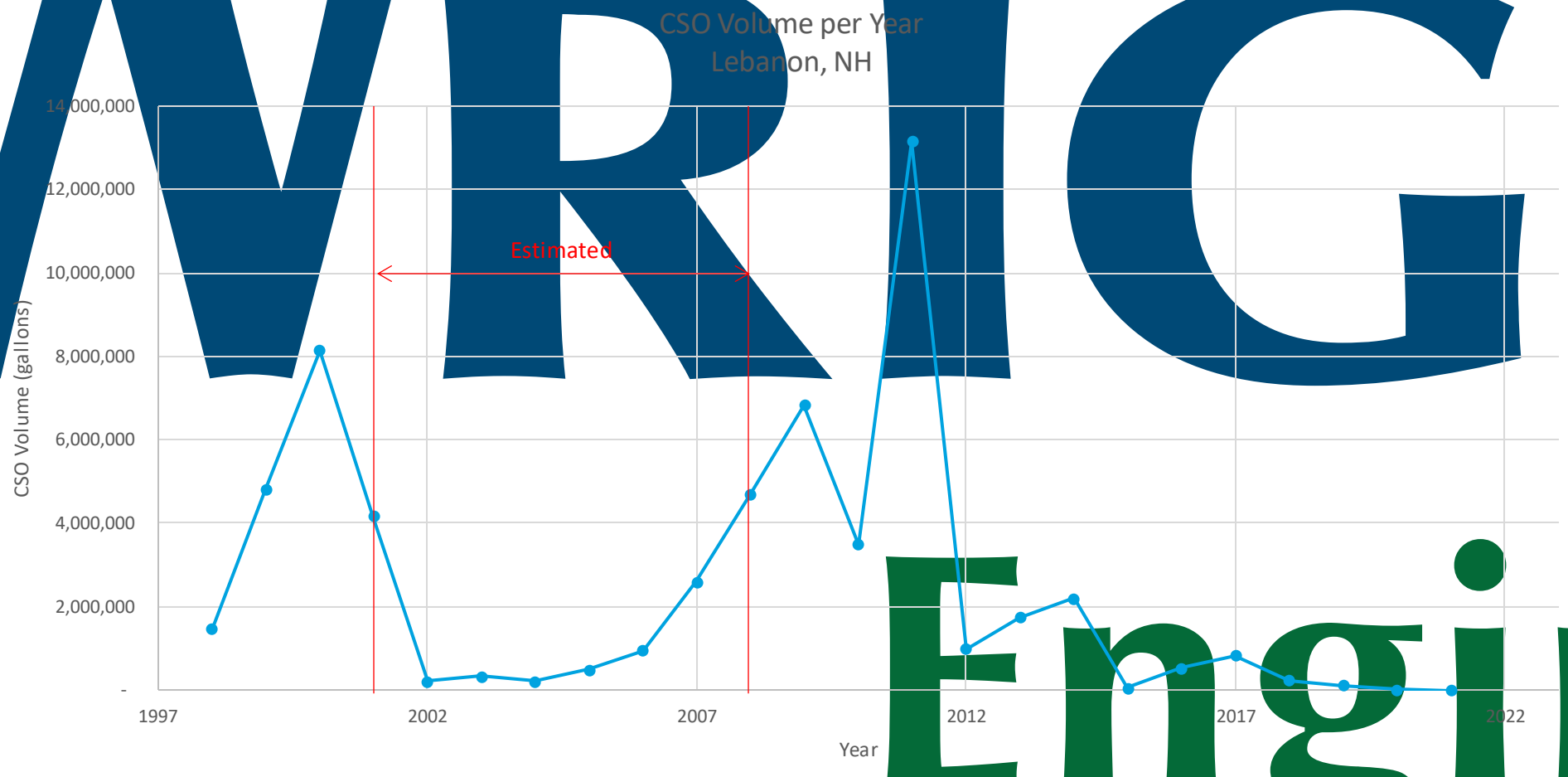
Contact Information
Mikayla Rumph (rumph.mikayla@epa.gov)
(617) 918-1016

BOSTON (Jan. 18, 2022) – The U.S. Environmental Protection Agency (EPA) is recognizing Lebanon, N.H. for completely eliminating all of its Combined Sewer Overflow (CSO) outfalls, therefore eliminating the need for the Consent Decree established between EPA and the City in 2009. CSO outfalls discharge a combination of wastewater and stormwater to nearby surface waters when the combined sewer system does not have the capacity to transmit all the flow of wastewater and stormwater to the treatment plant.

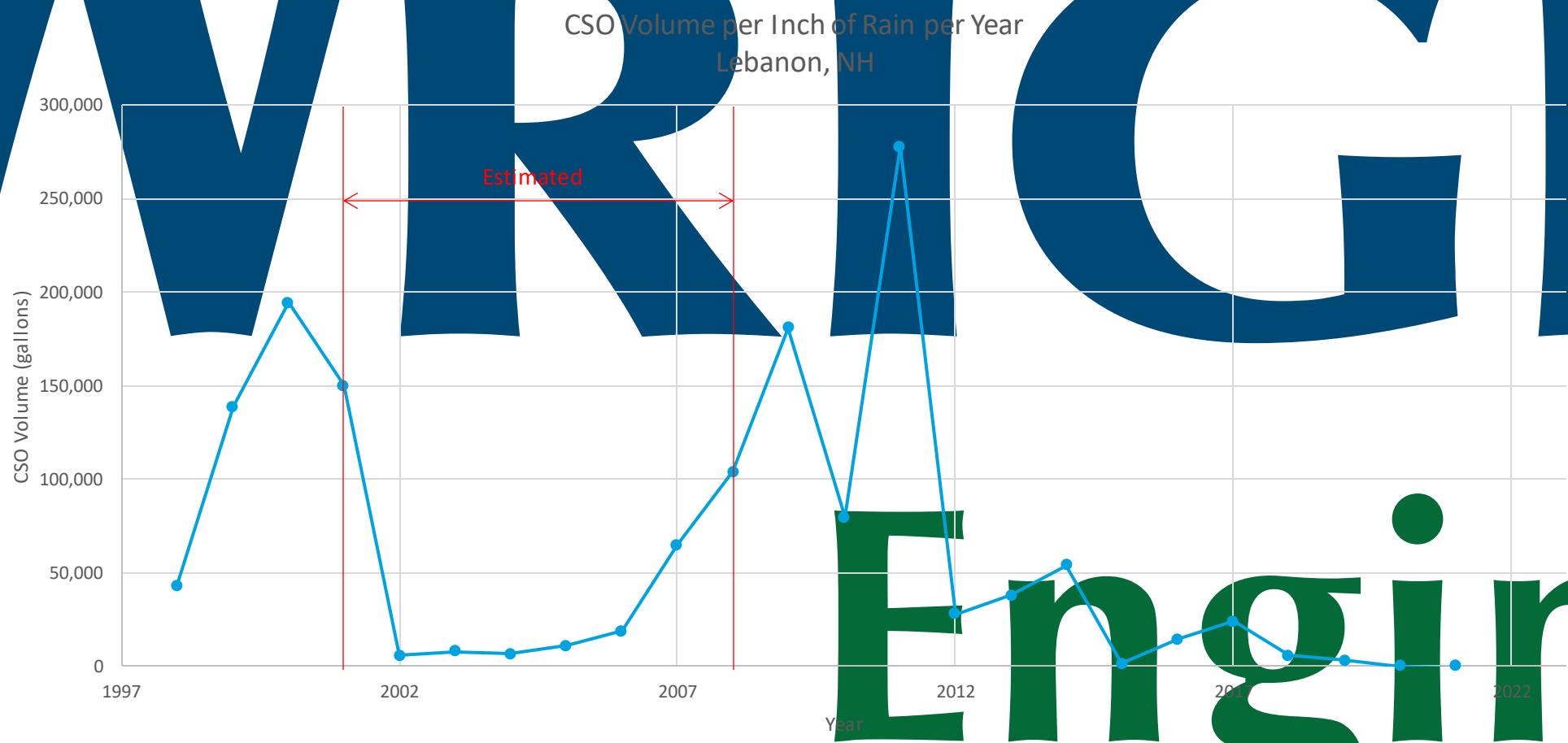
SO Re tion



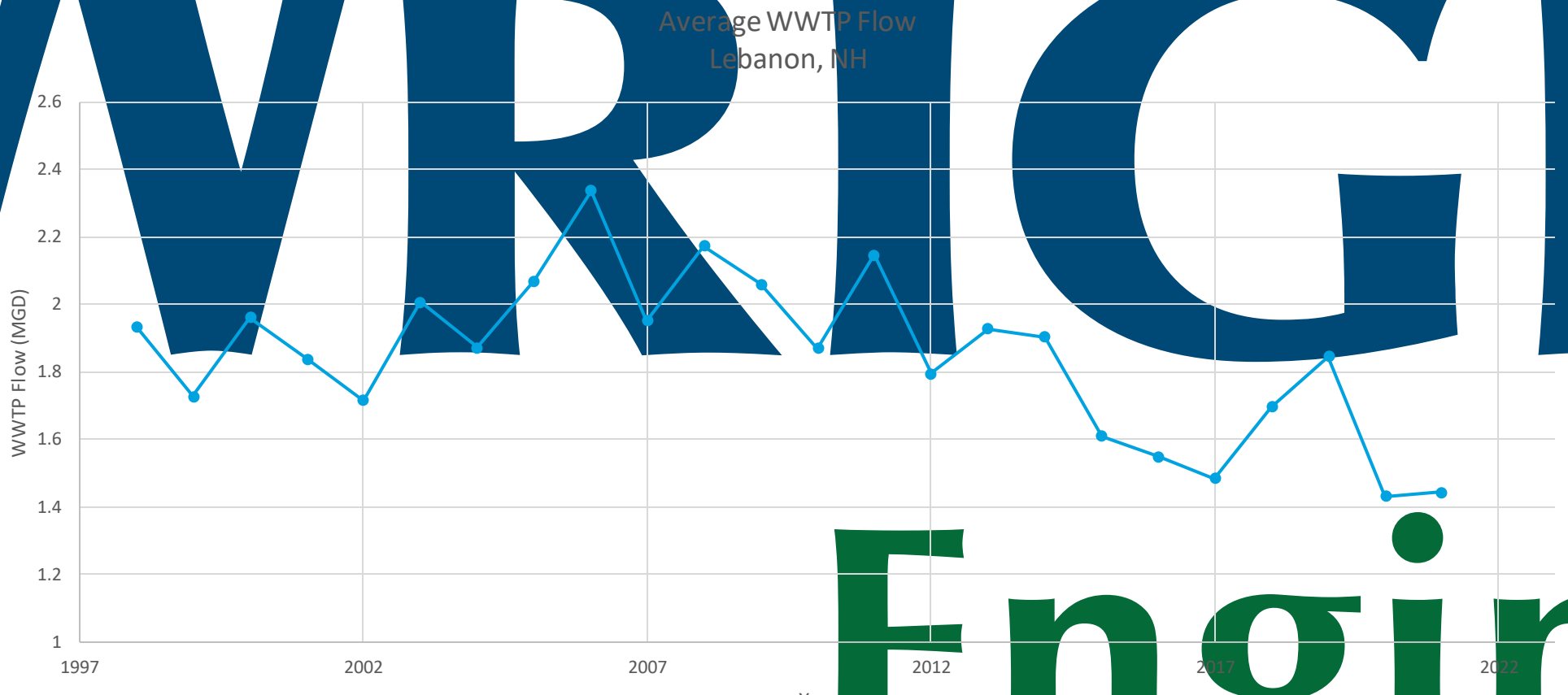
SO Re tion



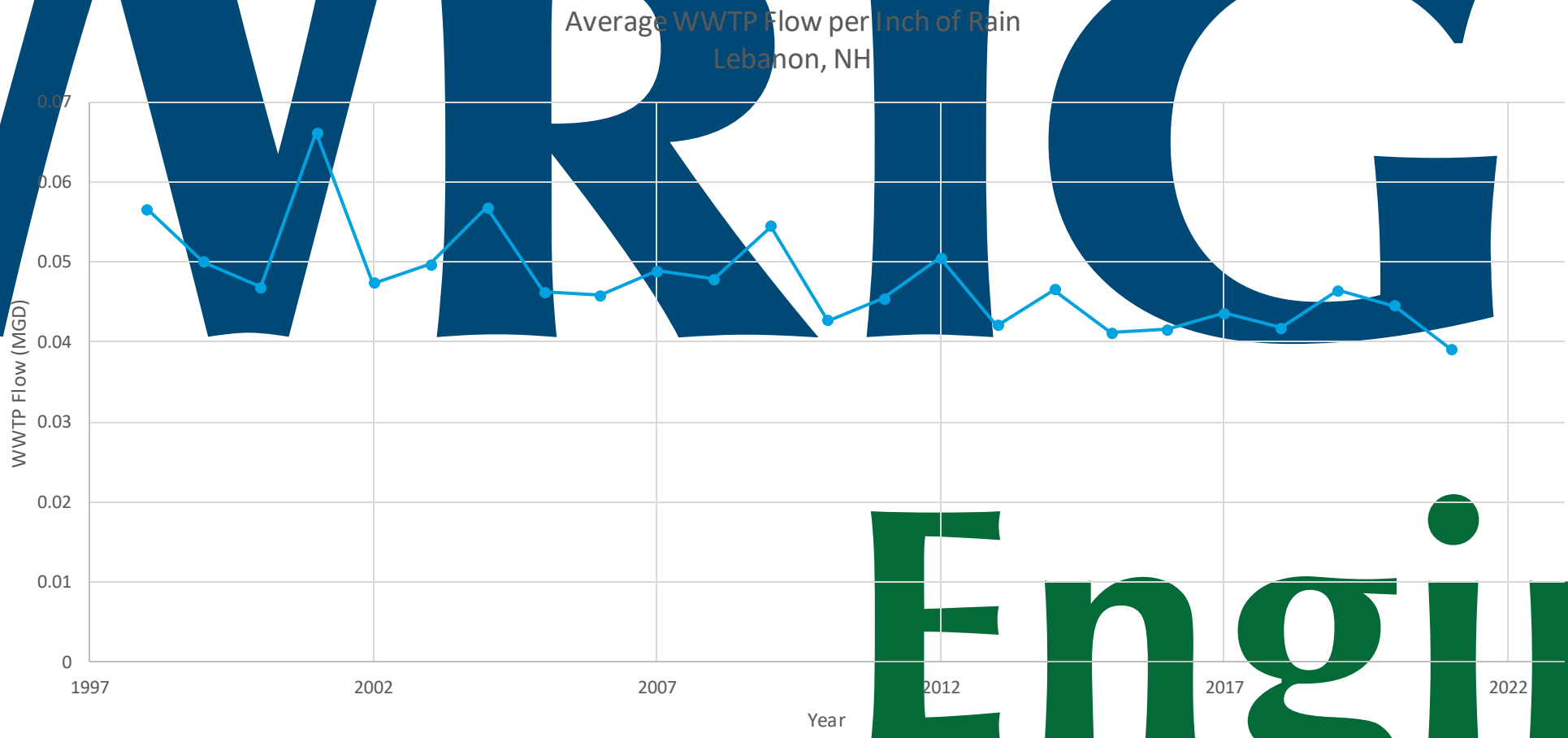
SO Re tion



ow Re tion o he WWTP



ow Re tion o he WWTP



Lebanon Collection System Circa 1998 – 2021

- Miles of Total Sewers/Interceptors = 38 — 38
- Miles of Storm Drainage = 14.2 — 30
- Miles of Combined Sewer = 15.2 (40%) — 1.0 (2%)
- Number of Combined Catch Basins = 350 — 76
- Number of CSO Outfalls = 7 — 0
- Number of CSO Discharges per Year = 78 — 0
- Volume of CSO Discharged per Year = 2 – 13 MG — 0 MG
- WWTP Average Daily Flow = 1.94 MGD — 1.44 MGD

Appreciation

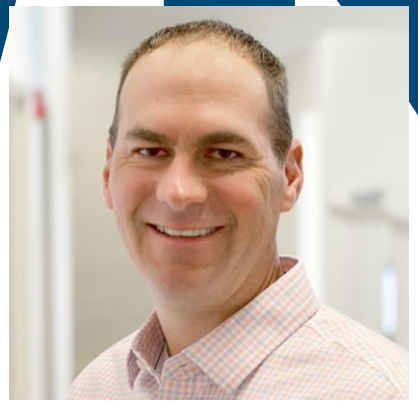
"We at NHDES often use Lebanon's CSO program as the **gold standard** for other towns/cities to strive for when planning, designing and constructing CSO projects. You and the Lebanon DPW team have not only become **model stewards** of stormwater and wastewater in your community, but also have built long term resiliency into your utility systems and transformed neighborhoods in the process, all based on your **holistic approach** to your CSO program."

- Shannon Larocque – Construction Manager - NHDES CWSRF

Thank You & Acknowledgements

- Christina Hall – City of Lebanon
- Erica Brittner – City of Lebanon
- Tracy Wood – Administrator - NHDES CWSRF
- Shannon Larocque – Construction Manager - NHDES CWSRF
- Kathleen Bourret – NHDES CWSRF Federal Administrator
- Randal Suozzo – NHDES DWSRF

Contact Information



RYAN WINGARD, PE

ryan.wingard@wright-pierce.com

207.523.1419

Q&A Discussion