Implementation of Sustainable Remediation Opportunities: "Win-Win" Solutions for All Stake-holders

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Former Refinery, New York

Site Background

- Products included gasoline, naphtha, paraffin, heavy oils
- Refinery closed in 1958 after fire
- Listed on NPL in 1983
- ROD issued in 1992 by USEPA Region 2

Site Setting

- 110 acres
- Adjacent to trout-fishing and recreational river
- Walking distance to high school, downtown, recreational areas
- State college located on part of site

Sinclair Refinery

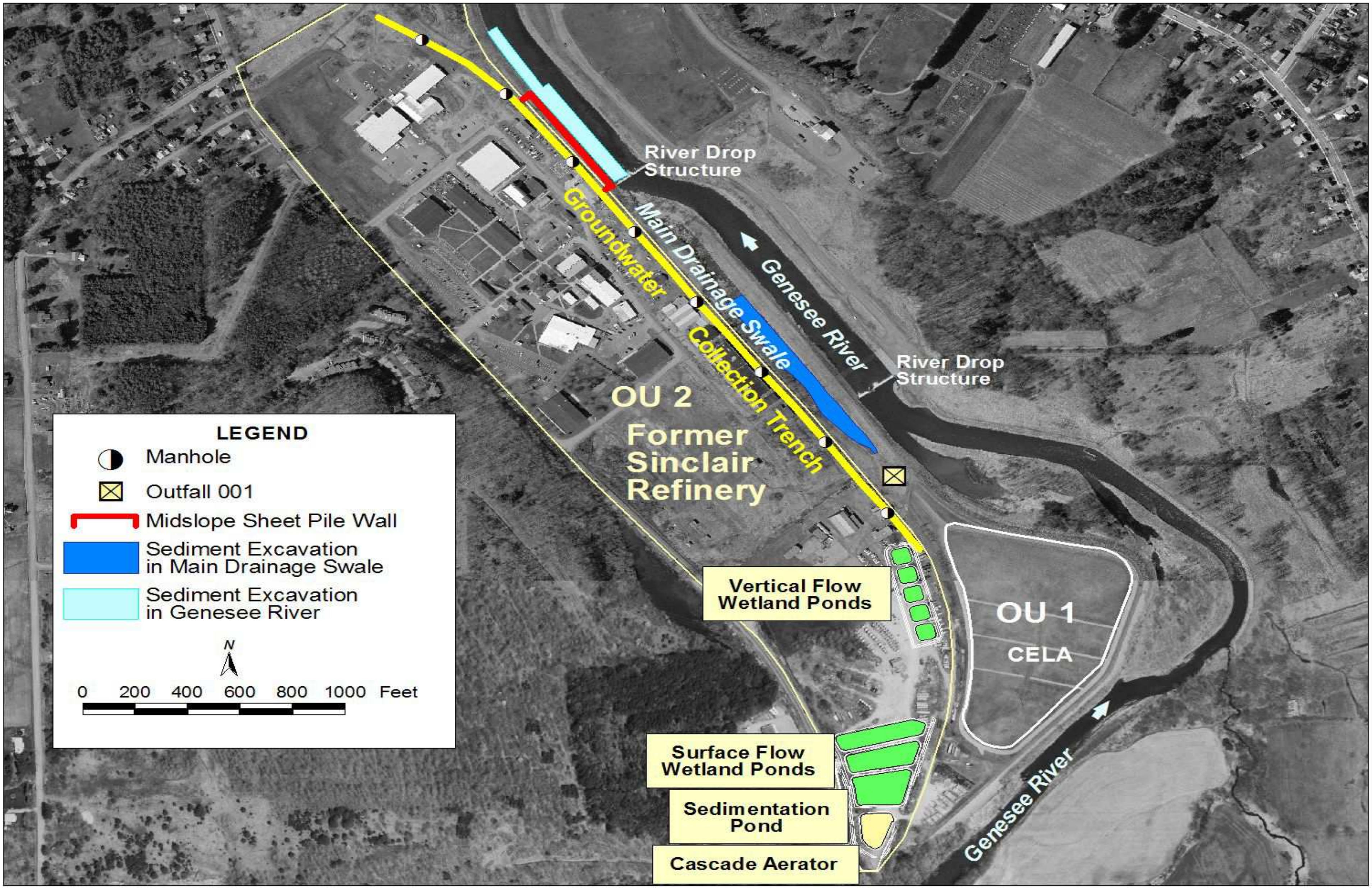
Early 1900s

Genesee River

Remediation History

- Slurry wall and landfill cap
- Air sparge/SVE
- GW extraction wells and GAC treatment
- Excavation in swale
- Installation mid-slope sheetpile
- Excavation of impacted soils and sediment in river
- Landfill reuse and cap restoration
- GW interceptor trench and wetland treatment system

Layout of Remediation Systems



Sustainability Applied to Remediation

Environmental Considerations

- Ecological approach to remediation
  - Constructed wetland treats groundwater before discharge into Genesee River
  - Replacement of grass landfill cap with native vegetation

Social Considerations

- Stakeholder input, community meetings
- Future use of site

Economic Considerations

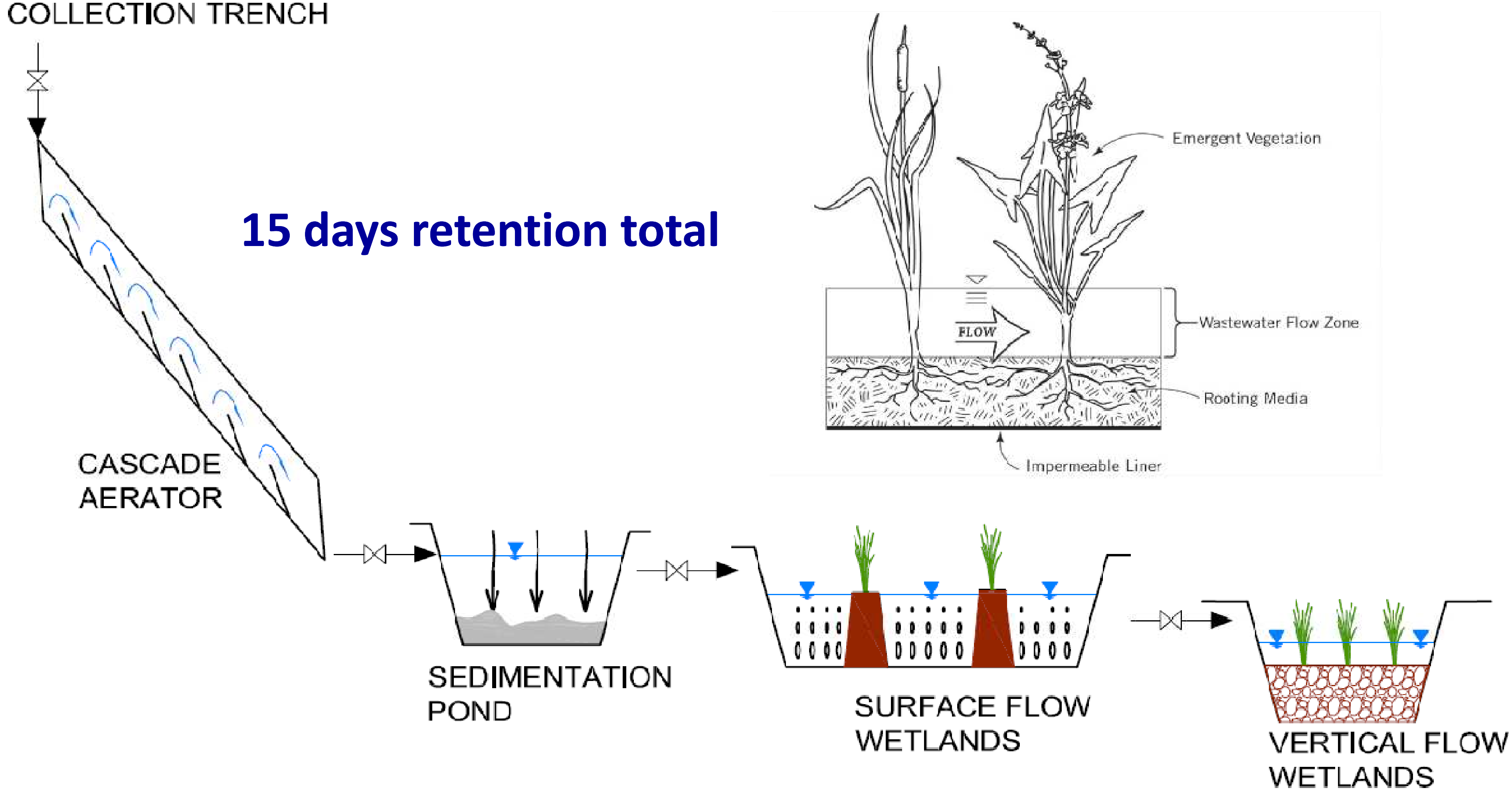
- Reduce cost of operating remediation systems
- Reduce costs for offsite disposal of sediments

Sustainability Applied to Remediation

Impact / Action	Environmental	Social	Economic
Dispose sediment / soils on site	Less transport, less air emissions	Less traffic; improved safety	No landfill costs for offsite disposal
New landfill cap native grasses, wildflowers	More wildlife habitat	Aesthetics	Less maintenance costs
Community access to restored landfill cap		Connectivity to recreation; educational opportunities	
Wetland treatment of impacted groundwater	No chemical use, less energy use, drainage compatible with site	Educational opportunities	Less maintenance costs

Schematic of Treatment Wetlands

15 days retention total



Constructing the Wetlands

Planting the Wetlands

Biofilter

Cascade Aerator

Sedimentation Pond

Surface Flow Wetlands

Vertical Flow Wetlands

Excavating
Bank
Soil from Swale

Backfilling
Swale

Driving Midslope Sheet Piling

Landfill Cap Restoration Plan

Removal of Existing Cover from Cap

Former Remediation System

- Groundwater collection from wells – 150 gpm
- Conventional treatment with GAC

Annual

Energy and materials	Usage	Cost
Electricity	242,000 kwh	$25,000
Treatment Chemicals	100,500lbs	$35,000
Granulated Carbon	4,500 lbs	$15,000

New Remediation System

- Groundwater collection via recovery trench – 150 gpm
- Wetland Treatment

Annual

Energy and materials	Usage	Cost
Electricity	186,000 kwh	$17,000
Treatment Chemicals	0	$0
Granulated Carbon	0	$0

Environmental Results

- Wildlife habitat and hiking trails on landfill cap
- Constructed wetland used to treat impacted groundwater
- 100,500 lbs water treatment chemicals saved annually
- 4,500 lbs GAC saved annually
- 1,000 loaded trucks did not travel 80 miles to landfill
- 3,350 tons CO_2e saved minimum*

*transportation only and does not include biomass credit

Economic Results

- $60,000 reduction in annual cap maintenance costs
- $50,000 reduction in annual water treatment chemicals

Social Results

- Reduced truck traffic, therefore reduced noise, improved worker safety (driving risk)
- Communications with Community Stakeholders
- Site reuse
  - Improved community access to wildlife habitat, river and hiking trails
  - Educational opportunities – Alfred State College

Summary

- Adding sustainable aspects to remediation projects doesn't have to be complicated

- Improving the sustainability of remediation can occur without new programs or requirements

- Change in water collection and treatment method and on-site disposal of 35,000 cu yds soil was completed with Explanation of Significant Difference

- Sustainability elements and impacts vary in priority depending on site

- Stakeholder involvement is key

Thank You   Q & A