Water Monitoring for the Exide Environmental Remediation Project on the Mill River
Fairfield, Connecticut

A Presentation by:
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Fairfield is a coastal community on the north shore of Long Island Sound. The town has a long and successful history of environmental stewardship, on the part of its officials, agencies, and citizens. Much of Fairfield’s character and quality of life is intrinsically tied to the water and shoreline resources of Long Island Sound and the town’s several estuaries, including the Mill River/Southport Harbor estuary.
The Mill River is Fairfield’s largest watercourse and one of the Town’s most significant natural features. The river flows over a winding 8-mile course through the center of Fairfield to Long Island Sound. Before entering the Sound, it gives shape to Southport Harbor, the Town’s most scenic and historic waterway. High tides carry saltwater two miles upstream in the river.
Electric Storage Battery Company

In 1951, the Electric Storage Battery Company opened a factory in Fairfield on a site adjoining the Mill River at 2190 Post Road. The company manufactured car batteries using acids and lead and assured the Town it would not discharge industrial waste into the river.

When the plant closed in 1981, it left behind a severely damaged ecosystem and an estimated 37 tons of lead in the Mill River.

Successful cleanup of the Exide site and Mill River over many years with much controversy is an important chapter in the history of Fairfield. There’s much to learn from what happened here.
Early Discharge Standards at Battery Plant Site

1951-1967: Little or no treatment

1967: CT Water Resources Commission issues order to treat lead-bearing discharges with “accepted” technology; level of treatment intended to reduce lead concentration to about 5 ppm

1972: Federal Water Pollution Control Act Amendments establish nationwide discharge permit program

1974: CT DEP begins CT discharge permit program and issues permit requiring lead concentration of 1 ppm

1979: CT DEP re-issues discharge permit and requires lead concentration of 0.5 ppm

Image Courtesy T. Steinke
"River Tests Ominous"

By the 1960s, the effects of lead pollution in the river were obvious. A long and contentious process ensued to clean up the site and river at the insistence of the Town’s citizens and elected officials. In 1965, the Fairfield Conservation Commission was established and took a leadership role.
Early Remediation Efforts

1979: Conservation Commission report describes significant lead pollution in Mill River; CT DEP tests confirm report.

1981: Battery factory shuts down.

1982: CT DEP issues Consent Order requiring Exide Corporation (then-owner of the site) to remove 4,100 cy of contaminated sediment from the river.

1983: Exide dredges 4,400 cy yards of contaminated sediment from river; some lead found at 600,000 ppm; factory site remediation begins.

1983-1989: Follow-up studies show increased lead pollution in river, likely additional discharges from the factory site.

1989: DEP Administrative Order requires Exide to determine source and degree of pollution.
Remediation: 1990s to Present

1992: Exide submits engineering report to DEP.

1998: DEP requires additional studies.

2008: DEP and Exide sign Consent Order for environmental cleanup; Exide begins sediment mapping; cleanup levels of 220 mg/kg to 400 mg/kg of lead are set.

2012: Draft Sediment Remedial Action Plan (SedRAP) presented by DEEP and Exide to Town at public meeting; Town agencies, citizens, and organizations object to lack of Town input.

2012-2013: Collaborative meetings and consultations involving Town agencies and stakeholders, DEEP, and Exide; Town and stakeholder intervention in NPDES permit process; resolution of conflicts; completion of SedRAP and issuance of environmental permits.

Exide/Mill River Remediation Project: A Model for Environmental Cleanup

Project included: hydraulic dredging of lead-contaminated sediment from 5 river project areas; sediment pumped via floating pipeline to temporary processing facility on former battery plant site; dredged sediment de-watered on-site; filtrate water treated and discharged back into river; de-watered sediment trucked to landfills for proper disposal.
To Mitigate Water Quality Impacts:

1. Pre-construction baseline monitoring of water quality conditions, including turbidity conditions.

2. Establishment of threshold water quality values to be maintained throughout the project, including acceptable Nephelometric Turbidity Units (NTUs).

3. Design and employment of BMPs during all operations, including double-wall turbidity curtains and dredge pipe.

4. River monitoring, including turbidity monitoring, 24/7 during operations; dredging suspended at 10 NTUs over background.

5. Discharge monitoring at water treatment facility.

6. Post-construction confirmation monitoring of river conditions and groundwater.
Hydraulic Dredging of Lead-Contaminated Sediment

Precision dredging guided by GPS removed contaminated sediment and pumped it in slurry to processing plant. 11+ acres dredged to average depth of 2.3 feet; restrictions imposed to protect fisheries; BMPs for water quality.
Sediment processing facility established on former battery factory site; sediment de-watered in geotextile bags ("geotubes"); filtrate water collected in sump and directed to onsite water treatment plant; 39 bags used to de-water approximately 27,000 cy of sediment.
On-site water treatment system treated more than 100 million gallons of filtrate from the geotubes prior to discharging water back to river. Water treatment monitoring conducted according to NPDES permit; lead amounts in treated water significantly below permitted limits (7-11% of permitted limits).
Project Completion

Following de-watering process, sediment was tested and classified for disposal as solid or hazardous waste and trucked to four different out-of-state landfills; sediment load-out involved 1,154 truck loads and 32,000 tons of de-watered sediment. All aquatic and upland confirmation samples met SedRAP and permit requirements; final Implementation Report submitted to DEEP and approved in 2017.
Lessons and Conclusions

• Community groups and individuals can make a difference.

• Laws and regulations are not sufficient to solve complex environmental problems; public interest and involvement are essential.

• Legal intervention and a public hearing may be necessary – be aggressive in getting a place at the table.

• Trust and respect among stakeholders and credibility of participants is essential.

• Long-term commitment is needed to advance stewardship initiatives and must be sustained when controversy, other obstacles, and frustrations occur.

• Continued community outreach and expansion of knowledge and understanding are critical.
Lessons and Conclusions (Cont.)

• Involving the community, its agencies and people, in the remediation planning process was critical.
• Dialogue instead of presentations; “people to people” communication contributed to project success.
• Technical information transmitted to the public in an understandable way was most helpful.
• Ability to communicate and work with people is just as important as technical knowledge.
• The Harbor Management Plan is an important tool for advancing water quality initiatives.

Photo Courtesy T. Corell
Acknowledgments

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Conservation Commission
Shellfish Commission

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Water Permitting and Enforcement Division
Land and Water Resources Division

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Power Point presentation by Geoff Steadman and Mary Hogue
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