Exide Environmental Remediation Project on the Mill River and Southport Harbor Fairfield, Connecticut

A Presentation by the Harbor Management Commission September 2020

The Town of Fairfield in Southwest Connecticut



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.



Mill River

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.

Southport Harbor

Southport Harbor at the mouth of the Mill River is one of Fairfield's most valuable natural resources — a center of boating activity in western Long Island Sound and one of the most scenic and historic locations on the Connecticut coast.

The harbor played a prominent role in the development of Fairfield and continues to have a significant influence on the Town's quality of life.

Since 1986, the **Fairfield Harbor Management Commission (FHMC)** has principal responsibility for guiding the harbor's beneficial use and conservation.



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

WEDNESDAY, MAY 2, 1979 FAIRFIELD, CONNECTICUT **River tests ominous!** By DANIEL B. WASSERMAN

A report on wide-ranging tests for pollution in the Mill River and elsewhere in Fairfield, reported underway last Summer, is expected to be presented this week to the Conservation Commission-and not all the news will be good, it was learned last week.

"We found some problems," Conservation Director Thomas Steinke said Thursday. He declined to comment on specific findings until the matter was presented to the commission, but the testing is known to include analysis of heavy metal content in the Mill River. In July, while noting that results were incomplete, Steinke said that the data could have "legal implications."

At that time, he also said some of the tests might relate to the Exide Storage Battery plant on the Post Rold, where collution of the river with lead and acid has been alleged a decade. Steinke accused the

inuing to release lead-containing Mill River pe into the water, although plant aid that the factory, which

sewage into the town's sewer

ystem. Mr. Moore said that after

age 16

pollution study set

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The town's Conservati Department, state officials and Exide Storage Battery enresentatives have agree on the scope of an enlead to "an eventual solution of the lead problem in the Mill River, according to a Con servation Department Conservation Director Thomas Steinke in a report is April last year accused ESB of "having knowingly" con-taminated the Mill River with taminated the Mill River with lead pollution. The state Department of Environmental Protection conducted tests last Summer which confirmed Steinke's findings, stating "tons of lead" has been deposited in the river. ESB chose York Wastewater to prepare the study which will consider "high/low pH alarm and in creased recycle of wastewaters to the process to reduce the quantity of lead in remuce the quantity of lead in the discharge," according to June 27 correspondence the DEP and the Conservation Constitute. Commission: The DEP correspondence indicates that "some type of effluent monitoring system should be installed," and also suggested a settling tank be used "when cloudlness is apparent" in the plant's discharge. lischarge. The York study also wou

se dys cash if necessary to file for the wate is constrained. The provided of the point of the provide contained of the point of the p The York study also would consider sediment removal, devatering and disposal plus, core samples. The DEP correspondence said the report "implies a two-month extension" in the August 31, 1980 deadline. However, ac-cording to a Conservation Department spokesman. the type and the extension will not effect the August 31, 1981, deadline for the im-

dementation of a system minimize the effect of th lead contaminates "We don't know when th lead contamination happens. It happens occasionally. We'll o down and see the water, see it spread out on the water. But we're satisfied with the progress and the guideline for the report," the Con ervation spokesman said. Asked when the lead would

be cleaned out of the Mil River so that people could

minnows, for chromium, iron, and cadmium, as well as lead. Wiggins declined to characterize the results of those tests, saying that while the state at one time had tentative standards for metal in shellfish, they were never adopted The DOH test results, while reported out of the laboratory on figust 23, 1978, were not obtained by the town until list

Wiggins said the precise geographical origin of marine life samples submitted to his division was not indicated by the fown.

DEC 231980 **Pollution report**

The Fairfield Citize

min. cinten - Jorro the 'mystery' pollution

By FREDERICK REISS

July 30, 1970

FAIRFIELD

The Conservation Commission announced last Thurs state Department of Environmental Protection will engineering study at the end of this month which will c tent of the lead pollution deposited into the Mill River Corporation, 2190 Post Road.

HAD. United a state was been as extended by the state was been as the state of the state of the state state and be been as state as all be being contracted as the state state state and be been as state as the state state state state and be been as state as the state sta The engineering study, conducted by York Wastewa ford engineering firm, will define the pollution prob pose methods to prevent lead discharge into the Mil N Exide's outfall pipe, according to Wetlands Compli 01 Richard Jacobson.

Jacobson informed commission members that Wastewater study would be sent to the Department of tal Protection, and then the study would be released the town.

The study is the end result of an environmental rep by Conservation Director Thomas Steinke in Apri determined ESB was dumping lead into the Mill Riv acting on Steinke's report, conducted a study during t 1979 that revealed tons of lead had "historically acc

Wesley Winterbottom, DEP principal sanitarian, la

week indicated DEP order could not override the

regular process to obtain a permit for the dredging

operation. "The DEP order could speed up the process.

But our order doesn't enable us to tell other agencies

what to do. We could process a review in weeks. But the

about a problem, they are very expedient, but I really

ther problem which the Conservation Department

can't be specific on how long that would be."

Army Corps of Engineers have a more time consuming

Clean-up of Mill River lead could take years

By FREDERICK REISS Getting the Exide Corporation to agree to remove 37 tons of lead wastes deposited in the Mill River could take as long as three years, according to Conservation

"Unless the Department of Environmental Protection Director Thomas Steinke. order-which states the Exide must clean up the lead in the Mill River by this Summer-can override permit channels to begin the work, the work won't be done for three years," Steinke indicated last week.

DEP engineering report released last January at 2190 Post Road had

"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.

state verifies lead data

The state Department of En-pliance Department of the agency. vironmental Protection has the DEP began testing the area received raw data from the state leads. Bepartment which indicates that there are levels of lead contamination in sediment, plant ife, and fish in the Mill River. "The level of contamination the high impact area — the area in which the greatest concentration of outfail where the Electric Storage Battery pipeline enters the river - is very high. The control area taken 1,000 feet upstream from the I-95 bridge indicated less lead." said Ed Parker, DEP sanitarian in the Water Com-

as a treat of Conservation on ESB which claimed lead contamination in the Mill River. Parker stated that the raw data verifies Steinke's findings of lead concentrations in fish, sediment, but that the lead count in plant-life was inta much more moderate concentration than Steinke's finding concluded in the report. According to Parker, con-centrations of lead in fish sampled water hasn't been neglected water tree

has been excellent with the dischar requirements set b

pared to 4 to 5 milligrams per kilograms in the controlled area. The plant life did show, the centrations of lead and the boltom sediments showed meterat concentrations, of lead in o con

at the impacted area were 30 to 40 milligrams per kilograms, com-

representative from Exide and the DEP results of the DEP engineering report

At the Conservation Commission meet

the panel asked Town Attorney Noel New

the group on possible legal actions which

press Exide to clean up the lead in the Mi

Steinke has indicated that the commi

Steinke said last week that no meeti

own, the DEP, and Exide has been arr

he "didn't rule out the month of April."

extent of the pollution problem

FAIRFIELD CITIZEN-NEWS, Wednesday, April 8, 1981

Army Corps of Engineers have a more uniportised in the commission of the strong of the

parison to sediments sampled i the controlled upsteam area. The DEP Water Complianc staff feels that the lead in the river results from a historical accummulation which had been i the river before ESB had been issued its permit. The leaden the

ording to Parker.

What we are plan

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inlete informatio

anize all the raw By ROGER V. AUTUORI ress recomme ninate the lead p

Representatives from the town, the state Department of Environmental Protection and Exide Storage 07 Battery Company met last Wednesday to discuss 0 implications of the DEP report that said tons of lead ent of the lead pro CZ deposited in Mill River from the factory have con-taminated fish, wildlife and the vegetative food chain itions to the probl ort is compiled," s along the river.

ITIZEN-NEWS, Wednesday, December 12, 1979

By FREDERICS. REISS

The state Department of has a file on the Electric S

on river pollution to ESB

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First Selectman John Sullivan, one of those who participated in the meeting, said another meeting will be scheduled between ESB and DEP officials to discuss ways in which to clean up the river and adjacent area

At issue is whether ESB will assume the full cost of removing the lead or otherwise cleaning up the contaminated ground and restoring the area.

The battery manufacturing company and DEP are scheduled in the near future to conduct further tests of discharge pipes leading into the river that may be bypassing the factory's treatment system

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study to determine the exact area and extent of *e Corporation may close down its plant at 219* contamination along the river. The DEP's Water Compliance Department study

reported the approximate extent of lead deposit dumped into the river during a number of years to be an area 100 square years and one and one-half fee

The DEP study begun last Summer following a similar report by the local Conservation Department. urged the dredging of the area as a most desirable ong-term solution but raised the possibility that the action could resurface lead deposits in the water and contaminate other areas along the riverway.

As a result of the town Conservation report, local health officials banned fishing, swimming and other recreational activities in the lower part of the river last Spring.

The DEP report suggested that ESB conduct

july 26, 1978

Mill River test results

bottled as incomplete Meeting in closed executive session last Thursday, the servation Commission upheld Conservation Director The Science's retrain to release data obtained from record pails studies of the <u>MII River</u>. The group cled incompleteness of records as its reason.

wrate Monday to the proofs as soon as it is complete. "Stellar port release the finites. News, which had requested that it town's study ... is incomplete at present, the commission feel i would be presenter and, it at terms of the lifetibed for mikin-teropretation of the findings, treepossible to release the 4-to -

State sets Mill River testing

between the Electric Storage Battery Company, town of-icials, Fairfield's Conservation Commission, and the DEP m May 25. Purpose of the testing is to determine if the

and continues to cause pass communication of the relation of Executive. ExPaying, DEP sensor nanitarian engineer for the Waler Compliance Department commented: "I'm secolity a list of testing procedures to the Conservation Continuing and ESB, We're trying to touch all bases to noneduce these totts to meet enceyone's demands, We're testing the Mill River

FAIRFIELD CITIZEN-NEWS, Wednesday, February 25, 1981

water quality, the bottom sediment, discharge from ESB has had on

mission will make its study available to you as se e." Steinke concluded, without specifying a date.

Lead in river discuss



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The testing will be completed by the end of July; ESB's lead discharge was sampled on June 6. At that time, DEE recorded a 1.2 parts per million discharge. The ESB permit requirement allows only 1.9 parts per million, bet buy violation is considered minor, according to a DEE



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.

2014-2017: River cleanup and successful remediation in compliance with SedRAP and 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; dewatered 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 dredge pipe and turbidity curtains.
- 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.

<image>

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

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.

Water Treatment System

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.

Power Point presentation by Geoff Steadman and Mary Hogue Aerial and other photos © by G. Steadman and others as noted. All rights reserved.

Acknowledgments

Town of Fairfield

Board of Selectmen, First Selectman Michael Tetreau Fairfield Delegation, CT General Assembly Harbor Management Commission Conservation Commission Shellfish Commission

CT Department of Energy & Environmental Protection

Remediation Division Water Permitting and Enforcement Division Land and Water Resources Division

Fairfielders Protecting Land and Neighborhoods (FairPLAN)

Mill River Wetland Committee

Exide Group Incorporated and its engineers and consultants

Special thanks and recognition to Thomas J. Steinke, Town Conservation Director from 1971 to 2014. Successful cleanup of the Exide site and Mill River is due in large part to his meticulous and unrelenting research, analysis, and advocacy.