Waste: Part 3

Past Mistakes, or *The Ghost of Garbage Past*

Lisa, I don't need this. I swear to God, I do not need this right now, okay? I've got a recycling rate that's abysmal. A world that consumes too much and throws it all away. E waste up the wazoo and more plastic in the ocean than fish. I got no money, a dress code problem, ***and*** a little murder case which, in the balance, holds the lives of two innocent kids. Not to mention your...

[Vinny taps his foot]

..."biological clock" - my career, your life, our marriage, and let me see, what else can we pile on? Is there any more shit we can pile on? Is it possible?

(Mostly) My Cousin Vinny (1992)



Why Study Past Mistakes?

In general, we study the past in the hope of not repeating mistakes (George Santayana).

Specific to solid waste, past mistakes represent very real problems for the present and future. To echo the sentiment of William Faulkner: “The past is never dead. It’s not even past.”

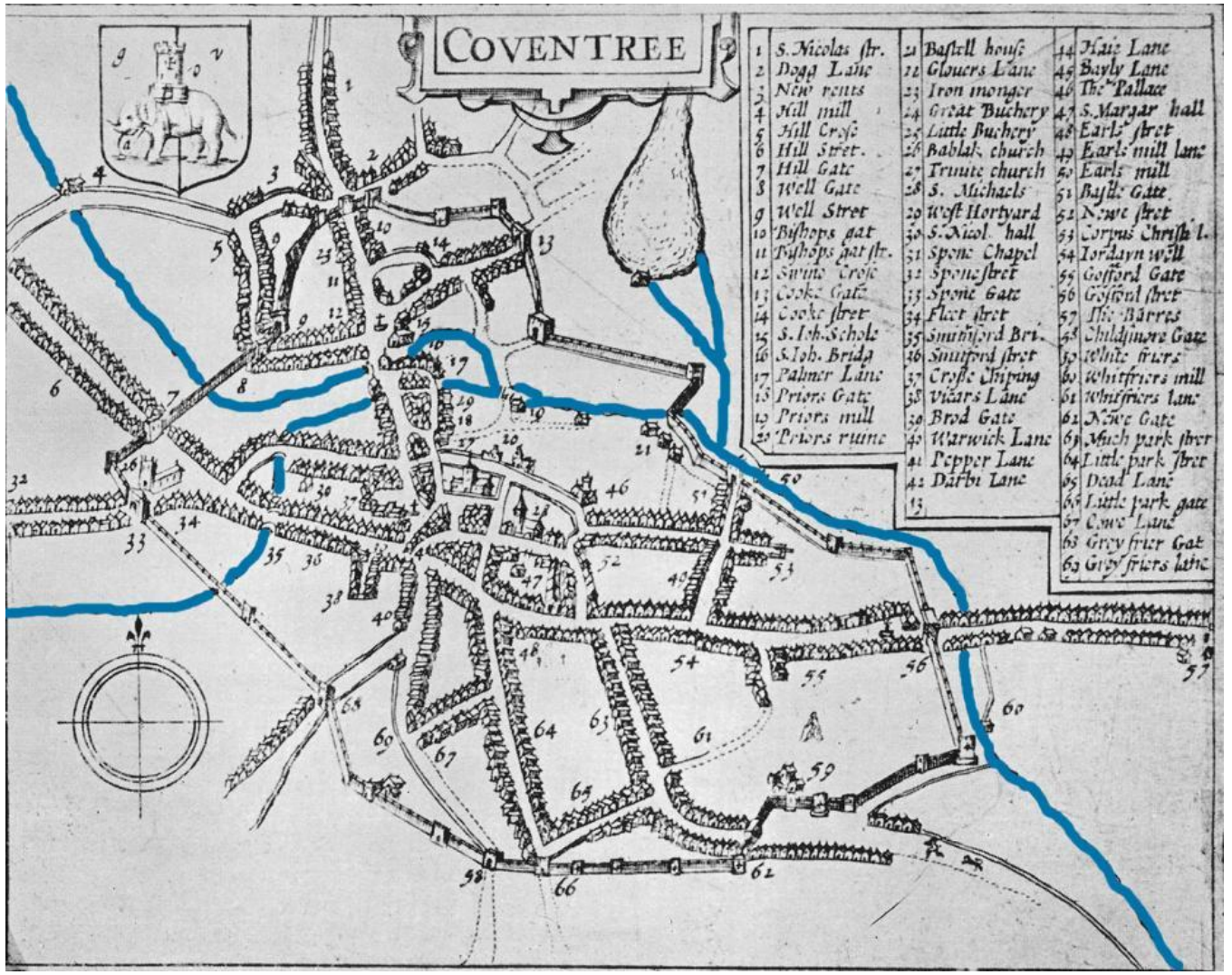
The problems connected to these sites (e.g., contaminated soil, groundwater, and air) remain with us and, if we do not act, with future generations.



History of Waste Management

Solid waste, historically, was a locally managed issue with the responsibility for proper waste management relegated to the generator. Initial waste management regulations were public health initiatives related to nuisance conditions that could be identified by smell. In 1421, the City of Coventry (England) banned the disposal of butcher wastes within the City limits, prohibited the discharge of animal wastes into the River Sherbourne, and required each resident to clean the sidewalks in front of their houses.*

* Tangentially related, John Shakespeare (father of William) was fined in 1552 for maintaining an unlawful "dung heap" in Stratford-Upon-Avon.



1661 Map of Coventry, England

(River Sherbourne shown in BLUE)

History of Waste Management

In Paris, France, butchers were forbidden (1350 ordinance) to dispose of offal within the City limits but the City offered no centralized organization for waste collection.

The stench of waste was an obvious threat to the public within the context of the prevailing theories about miasmatic disease transmission; and thus exposure to it needed to be limited. In this way, the development of early sanitation measures can be directly linked to the medieval sense of smell and interpretation of odors.

Source: The Five Senses of the City, in the Medieval Ages (2011), by Krampl et al.



History of Waste Management

These regulations in England and France underscore both the localized control of waste management and the reliance on private waste haulers.

In China at the same time (Ming Dynasty, 1368-1644CE), collection and disposal of garbage was a service managed by the army. By the late Qing Dynasty (1644 – 1911), this service has disappeared and private collection has returned.



Historic photo of Beijing garbage collector, late Qing Dynasty (date unknown)

History of Waste Management

In 1751, London becomes the first Western municipality to include solid waste management as a public service with the following strategies*:

- Organized City-wide waste pick-up;
- Transport of waste “to proper distances in the country” and
- Use of the Thames (down river).

* Source: London Waste Strategy, Corbyn Morris (1751)



History of Waste Management

Solid waste management in the US has a similar history.

Up until the late 1800s, little effort was expended by municipalities to define what garbage was and how to manage it. Most solid waste was managed privately; “management” in many municipalities consisted of allowing pigs to run free or dumping garbage into nearby waterways or undesirable lands (e.g., swamps).



History of Waste Management

In 1893, a Dutch immigrant named Harm Huizenga begins a small business collecting garbage from businesses in Chicago, charging $1.25 per wagonload. That business (now called Waste management, Inc.) is a $200B entity.

Like most haulers in Chicago, Huizenga dumped his waste into swampy areas along Lake Michigan, helping to contribute to what today is Grant Park.



History of Waste Management

This changed in the late 1895, initially in NYC before spreading across the country.

The catalyst was the confluence of increased populations and more frequent outbreaks of diseases.

In 1895, George Waring was hired by NYC and he initiated regular waste management collection (white-uniformed sweepers). He also located waste repositories in remote areas. The success of NYC is copied.

In 1900, almost no American cities had solid waste management systems, 80% did by 1910.*



*Source: *William Rathje and Cullen Murphy,* Rubbish! The Archaeology of Garbage *(New York, 1992),*

History of Waste Management



Impact was immediate.

Aesthetic and health improvements reinforced the community benefits of waste management.

As populations of cities grew in the 1900s and industrial operations became more complex, pressure to manage the various forms of waste mounted.

History of Waste Management

The Federal government first becomes involved in Solid Waste management in 1965 in response to inconsistent or nonexistent state regulations. While reinforcing the concept of waste as a "local issue", major changes include:

- Creation of a standard definition of Solid Waste, further subdividing the term into "industrial" and other special wastes.
- Establishment of minimum construction and operation standards for landfills and incinerators*.



* Solid waste incineration dates back to the 1800s. Principal complaints of early incinerators were odors and ash, reflecting the incomplete incineration of wastes resulting from burning at low temperatures.

History of Waste Management

But guidance from the Federal government did not translate into responsible, nationwide waste management. Landfills were generally open pits (often associated with open burning to reduce volume). Evidence emerging in the 1960s and 1970s indicated that groundwater and surface water contamination was commonplace near landfills. Air quality had yet to become an issue.



History of Waste Management

In 1976, President Ford signed the Resource Conservation and Recovery Act.

RCRA:

- Specified that all waste generated in the US falls under the auspices of Federal regulations;
- Separated waste" into "Solid" and "Hazardous" and provided a detailed definition of what wastes fall into the latter category;
- Introduced the process of "Cradle to Grave" management; and
- Established penalties of up to $25,000 per day (per violation) for noncompliance.



RCRA (1976)

Prior to RCRA, all waste was defined as “solid” with no differentiation in:

- Material management
- Waste transportation
- Waste processing
- Waste disposal

Post RCRA, wastes were required to be separated and managed differently and properly tracked to document the volume of wastes generated throughout the country, the chemical characteristics of those wastes, and the ultimate disposal locations of those wastes.



RCRA to CERCLA

A **hazardous** waste in 1976 was disposed of in accordance with RCRA regulations and procedures. But that same waste generated a year or two (or ten) earlier (defined at that time as a **solid** waste) could have been legally disposed of in a variety of ways and locations.

A provision in the RCRA law directed the USEPA to investigate locations around the nation where these wastes were dumped. By 1978, the USEPA created a preliminary list of these sites.

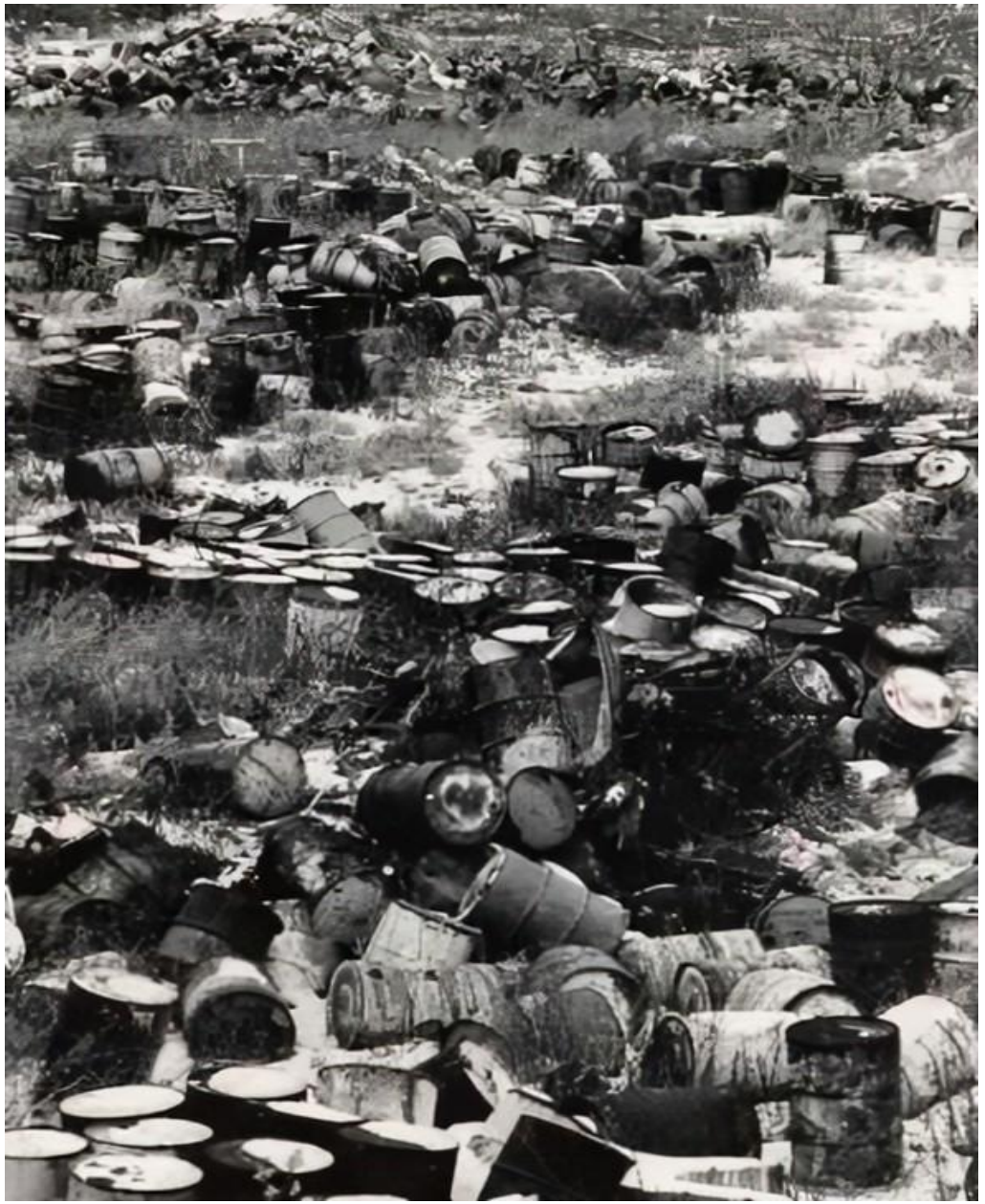
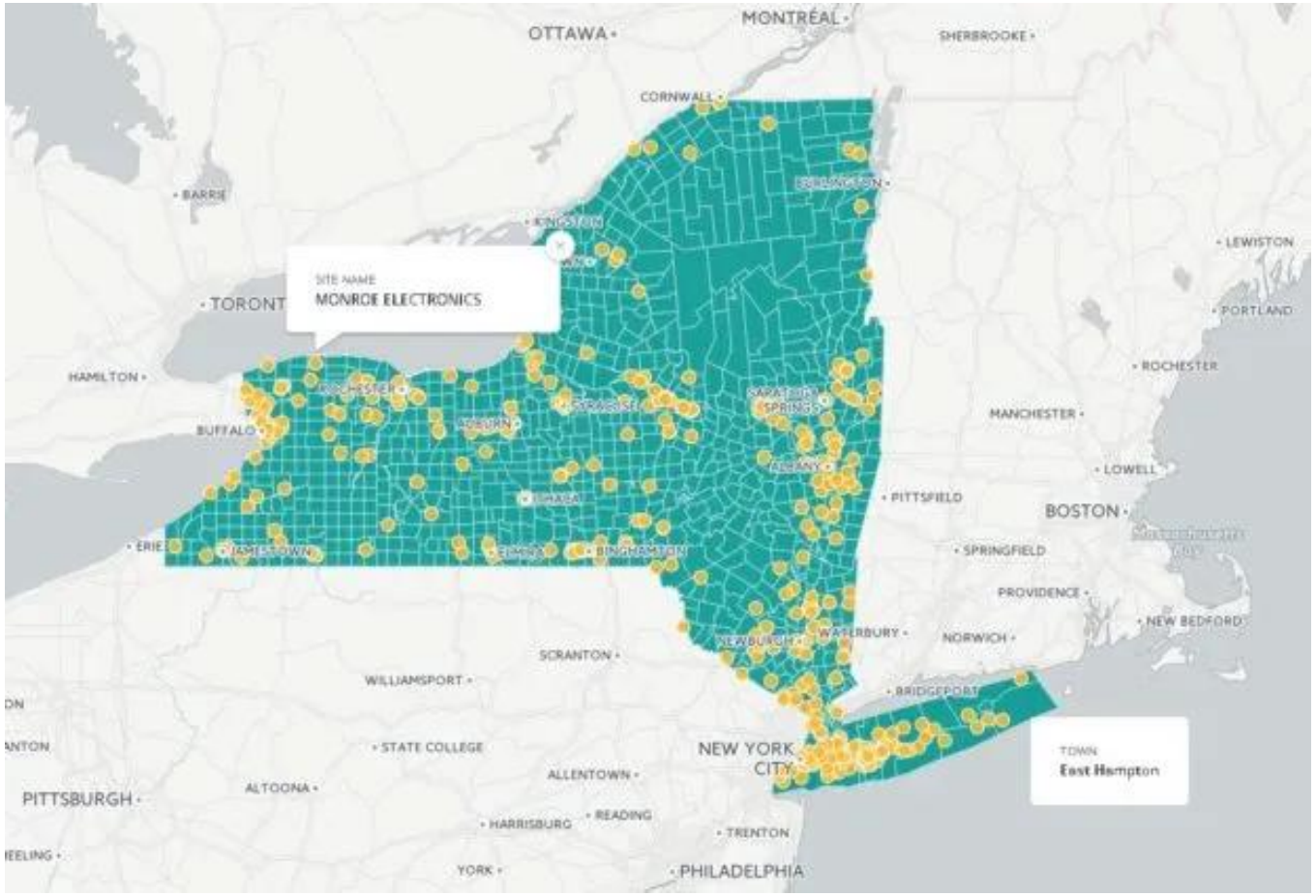


Photo shows a detail of a Site in Bullitt County, KY known as the “Valley of the Drums”. The 23 acre property was a repository for over 100,000 drums and containers of waste, starting in the early 1960s (when such waste disposal practices were legal).

RCRA to CERCLA

The USEPA compiled a list of over 35,000 sites across the country of presumed or documented soil or water (ground or surface) contamination. In New York State, over 1,400 sites were identified.

The presence of this massive inventory became a stimulus for the passage of legislation intended to investigate and, if necessary, remediate these site.



RCRA to CERCLA

1980: Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA")

(also known as "Superfund")

- Created a list of worst-contaminated site in US and rank-ordered them for investigation and cleanup (the "National Priority List", aka "Superfund List")*
- Defined "Responsible Parties" (i.e., those individuals and/or corporations that were involved in causing the contamination) and created a structure of making these RPs pay by making liability retroactive, strict, joint and several.
- Created a funding mechanism (so-called "Superfund") to pay for cleanups in the event that a responsible party (RP) could not be found and/or could not pay for all costs.

* There are currently (2023) 115 NPL Sites in New York State. The first NPL Site (Love Canal) is, in actuality, three separate NPL Sites. Five (5) Sites are in Dutchess County and three (3) in Ulster County.

RCRA to CERCLA

Superfund was criticized as being “overly broad”, “anti-business”, “flawed from the get-go”, and reliant on a “self-perpetuating blame game”.

Superfund liability was “joint and several” meaning that all RPs can be made liable for the same obligation and can be pursued by the USEPA for some or even all of the clean-up costs. This is justified in CERCLA because linking a proportion of damages to individual wastes can be difficult or impossible. At the same time, this becomes problematic with NPL Sites that have hundreds of RPs.

And securing compensation through the legal system is often costly, drawing resources away from the actual purpose of the program which was to clean up properties. A 1994 RAND Corp. study estimated that between 36 cents to 60 cents out of every dollar spent by RPs went to legal costs.

RCRA to CERCLA

CERCLA has been criticized as being **slow as well as costly**, with limited (if any) benefit to a Site's immediate community.

A 2009 study* analyzed 290 Sites that had been remediated. Findings:

- Remediation had little effect on local housing prices;
- Average time from Site Listing to Delisting was over 10 years;
- Average cost of remediation was $43 million.**

* "Superfund Follies, Part II" by Daniel Benjamin, *PERC Reports*, March 2009

** The two most expensive Superfund cleanups are not included in this estimate. The Hudson River Clean-up cost GE almost $1Billion (with future costs estimated at almost $11Billion if down-river stretches of the Hudson require active remediation) and the Ironbound Site in Newark NJ has an estimated cleanup cost of $1.4 -2.0 billion.



CERCLA to SARA (1986)

1986: Superfund Amendments and Reauthorization Act

- Reauthorized Superfund
- Clarified the definition of RP, creating the "innocent landowner" exclusion
  - "**Did not know and should not have known**"
  - Presumption of ignorance by residential property owners
- Required greater informational disclosure on the part of the regulated community
- **Title III, or Right to Know (RTK) rules**

SARA to Brownfields

The term “contaminated site” can be broadened to included properties where the presence of chemicals and/or wastes impede the unfettered development of that site (“Brownfields”).

The USEPA estimates that there are 450,000 of these sites across the country, including the Schatz Federal Bearing Site in Poughkeepsie.



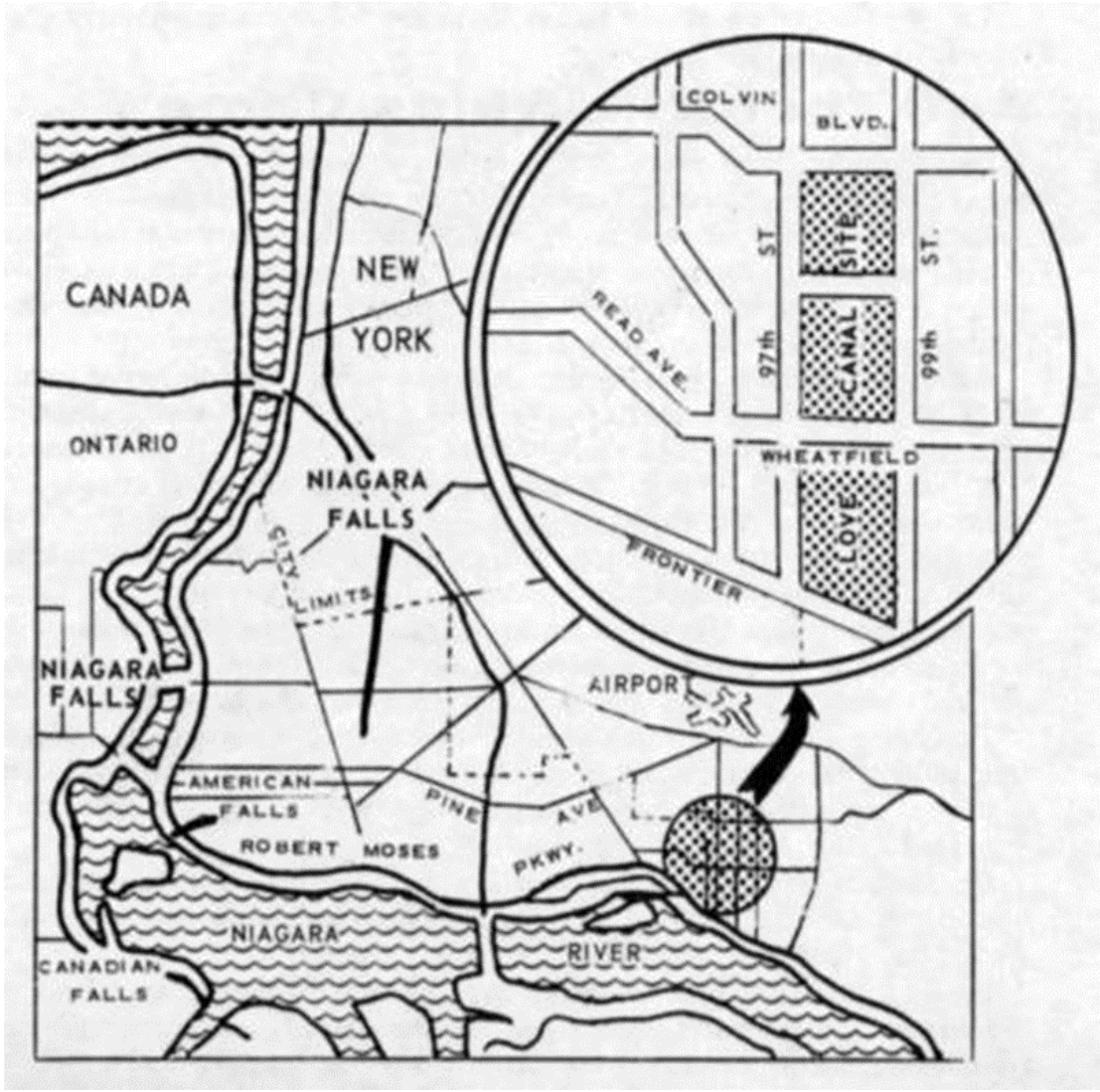
Love Canal: The First NPL Site





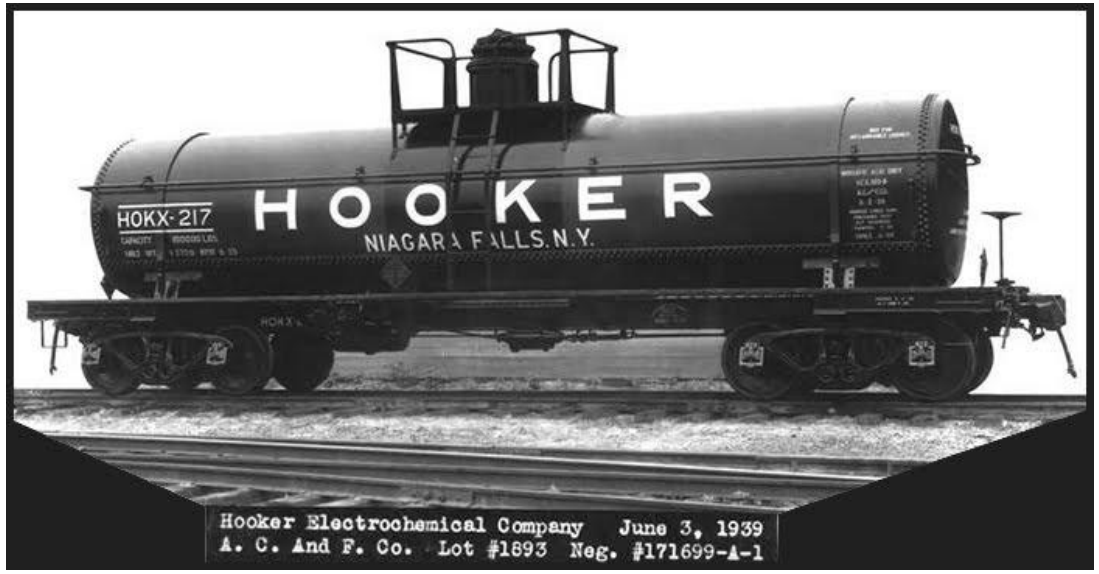
Love Canal

Love Canal was an aborted attempt to connect the Niagara River with the Erie Canal, north of Buffalo, NY. Excavation of the "Canal" was abandoned (1892) shortly after the project began, leaving a ditch 15-20 feet deep (at its deepest), 60 feet wide (at its widest) and 3000 feet long.



Love Canal

By the early 1900s, the ditch had been acquired by several municipalities and nearby industries as a repository for their waste. By the 1930s, the ditch became the exclusive dumping place for waste from Hooker Chemical, a local military contractor.



Love Canal

From 1942 to 1953, the Hooker Chemical Company, with government sanction, began using the partially dug canal as a chemical waste dump. Once dumping stopped (1953), Hooker had dumped 22,800 tons of toxic chemicals, including at least twelve that are now known to be carcinogens (halogenated organics, chlorobenzenes, and dioxin among them).*

At the time, Hooker Chemical was operating legally by dumping their waste in the Canal.**



* Hooker Chemical is listed as the Responsible Party, but many other companies were identified in the records as having deposited minor volumes of wastes at this site. The US Army was identified as a Responsible Party (minor) and contributed $9million to Site Closure costs.

** RCRA, the regulations defining Hazardous Waste and presenting management procedures, is not passed until 1976. For this reason, sites like Love Canal had to be managed under CERCLA ("Superfund").

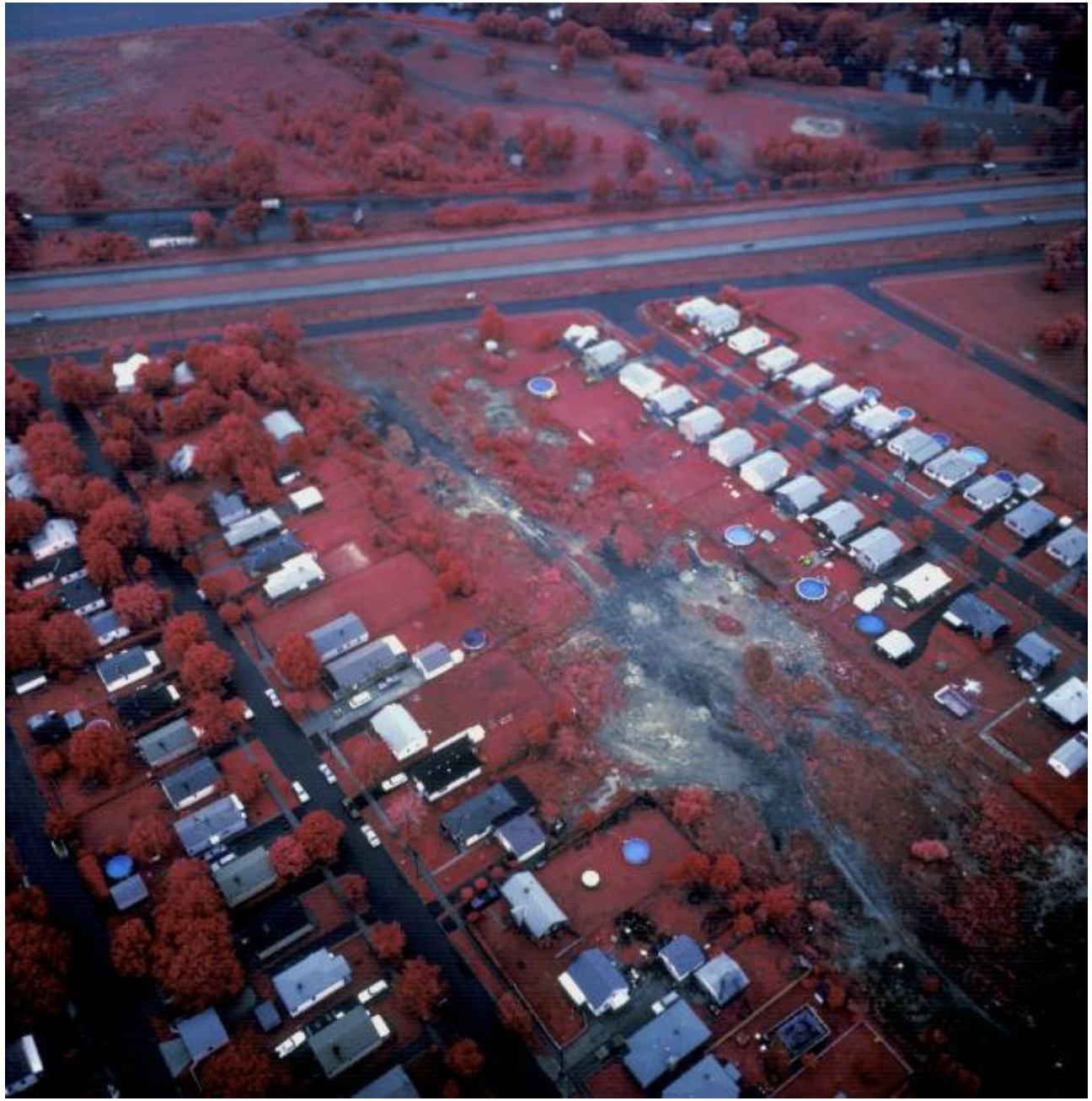
Love Canal

Hooker capped the 16-acre landfill (containing wastes that today would be classified as “Hazardous”) in clay and sold some of the land to the Niagara Falls School Board in 1953 for $1 with a warning about the presence of the buried waste (although the dimensions of the dumpsite was not provided) and a proviso that Hooker Chemical was not liable for any future costs. Other portions of the dump were sold to construction firms who were planning residential developments.



Love Canal

The School Board built an elementary school (and playground) on a portion of the property in 1955. By 1978, surrounding lands were developed with approximately 800 private single-family homes and 240 low-income apartments built around the canal. The community consisted of blue-collar workers with an average annual income of $10,000 – $25,000.



Love Canal

From the late 1950s through the 1970s, residents repeatedly complained of odors and substances surfacing near or in their yards and on the school playground. Discolored liquid was reported in house sumps and complaints of basement odors were filed with the Health Department.



Love Canal

Resident activity started with Lois Gibbs (shown at left), whose 5 year old sickly son was attending the school built on the dump. Lois Gibbs formed the Love Canal Homeowners Association (LCHA) in 1978 and pressured the NYS Health Department to investigate incidents of cancer and other serious health conditions.

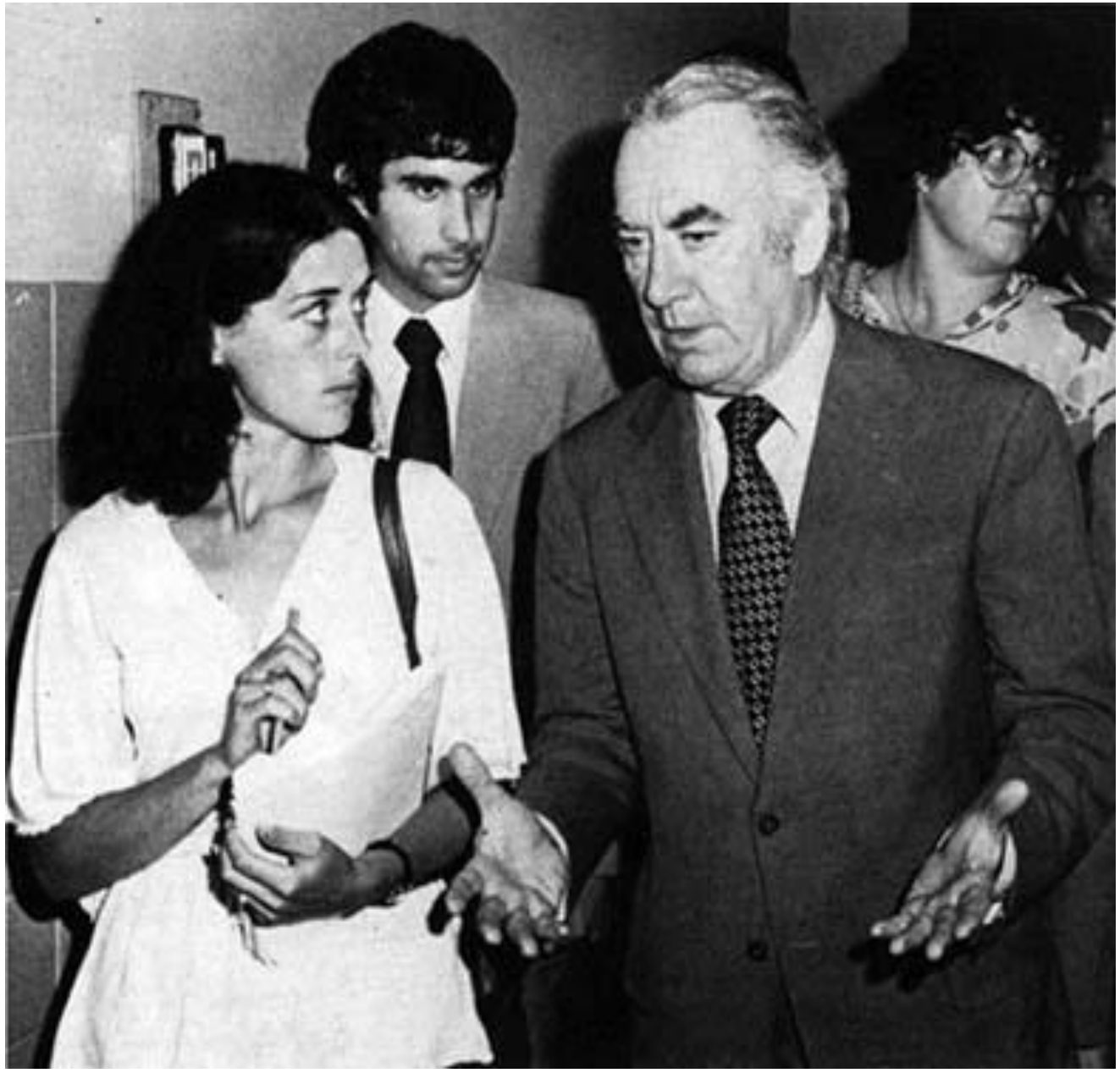


Lois Gibb meets with Gov. Hugh Carey in 1978

In response to NYS reluctance, the LCHA commissioned an independent study of health concerns in the neighborhood*. Completed in 1979, the study found:

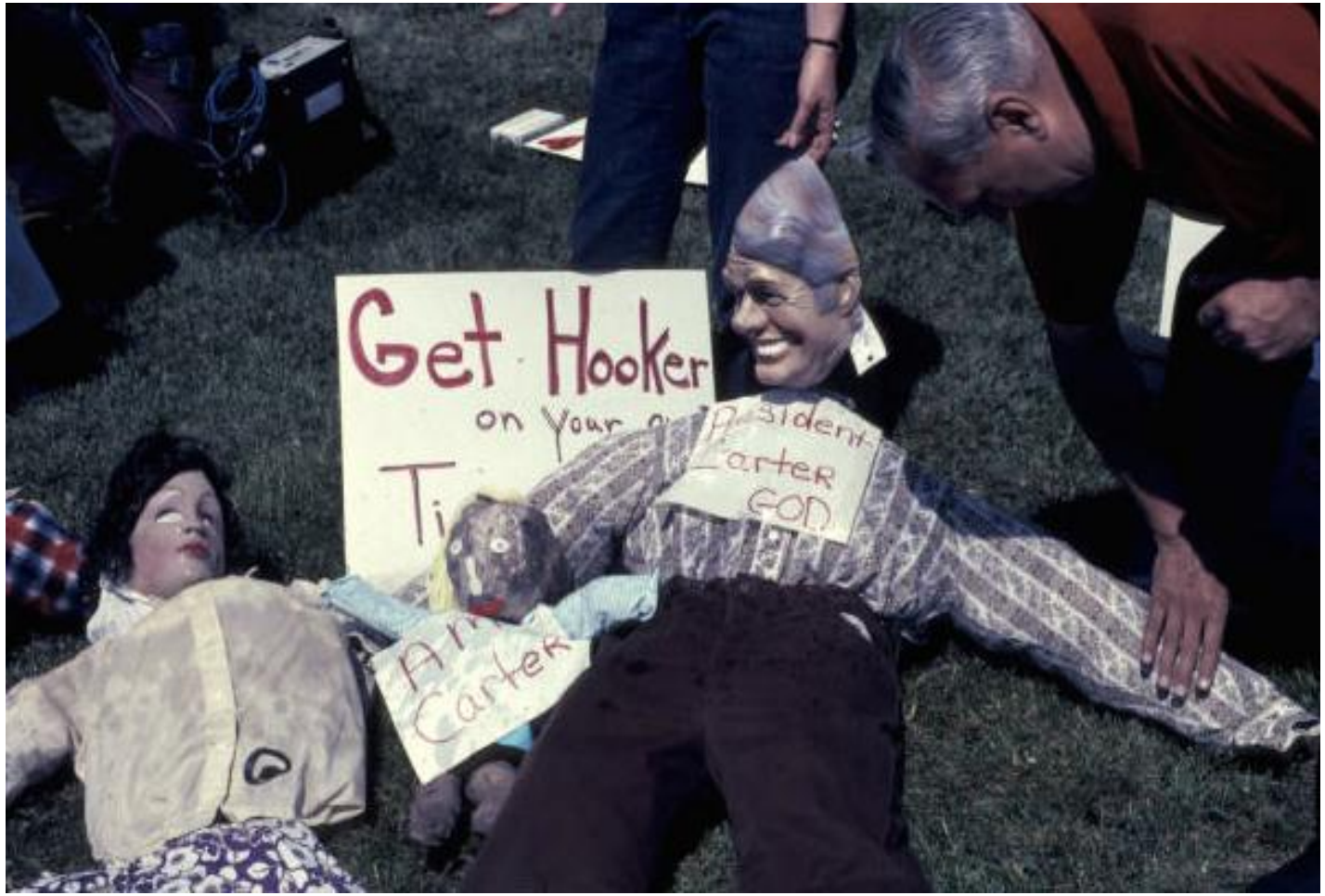
- Increases among residents in miscarriages, still births, crib deaths, nervous breakdowns, hyperactivity, epilepsy and urinary tract disorders.
- Miscarriages were found to have increased 300%, for example, and most occurred in women who lived in the historically wet areas.
- From 1974 to 1978, 56% of the children in the Love Canal neighborhood were born with a birth defect, including three ears, a double row of teeth, and mental retardation.
- There were almost three times as many defects in historically wet areas.

* The Study was conducted by Dr. Beverly Paigen, a cancer specialist at Roswell Memorial Institute, Buffalo, NY



Love Canal

In direct response to homeowner pressure, President Jimmy Carter declared a state of emergency in 1978 and had the federal government relocate 239 families. This left 700 families who federal officials viewed as being at insufficient risk to warrant relocation, even though tests conducted by the NYS Department of Health revealed that toxic substances were leaching into their homes. After another hard battle, activists forced Carter to declare a second state of emergency in 1981, during which the remaining families were relocated. The total cost for relocation of all the families was $17 million.



Love Canal

In September 1983 Love Canal was designated a Federal "Superfund" Site, with the dubious distinction of being the first such site designated.

Site clean up began in 1983 and continued (off and on as new conditions were identified) until 2004 when the USEPA declared the Site to be "Closed".*

Cleanup consisted of:

- Securing the Site and demolishing all structures (residences and school)
- Excavating and disposing of buried drums and soils impacted by the wastes contained in the drums
- On-site incineration of dioxin wastes
- Removal of tainted sewer lines
- Installation of a soil cover (over 40 acres, beyond the dimensions of the original dump)
- Treatment of groundwater



* "Closed" is an administrative term signifying the end of active remedial work. On-going maintenance of remedial systems and on-going monitoring of media (e.g., groundwater) may be required even for ""Closed" sites.

Love Canal

Total cost of Site remediation:

$400 million

Cost elements:

- Homeowner relocation
- Soil removal and treatment
- Environmental studies
- Legal proceedings
- Governmental oversight



Love Canal: Lessons

Lessons of Love Canal (and countless other Superfund Sites):

1. The Power of Local Activism to Move Public Agencies
2. The Willingness to challenge the government as the “expert”.
3. The National Awakening to Toxic Sites in Backyards Across America
4. The Expanded Role of Legal Recourse for Environmental Redress

Love Canal: Lessons

The Power of Local Activism

This cannot be understated. It was Lois Gibbs and the LCHA who prodded both the State Health Department and the USEPA and forced these Agencies to do their job.

The emergence of “Toxic Avengers” and other local environmental groups comes directly from Lois Gibbs.

Love Canal was a working class white neighborhood. It would take several years for the related concept of “Environmental Justice” to take root.*



* Environmental Justice, the concept of equitable distribution of environmental risks and liabilities, traces its roots to Warren County, NC. In 1982, the State of North Carolina selected a site in the almost exclusively African-American area of Afton for a landfill to properly bury 1000s of tons of PCB-contaminated soil from various locations around the State. Protests erupted to no avail.

Love Canal: Lessons

The Power of Local Activism (continued)

Teenage Wasteland (2026) is a documentary made from footage generated in the early 1990s by students at Middletown (NY) High School. The focus of the filming was the Al Turi Landfill in Goshen, NY and the students reported on illegal dumping (hazardous waste disposed of at a solid waste facility), improper management of disposed of wastes (uncollected leachate entering the Wallkill River), and unpermitted expansion of the landfill (waste being dumped outside of the boundaries of the approved facility).

The landfill was closed in 2003 and has been the subject of on-going NYSDEC investigations and remediation.



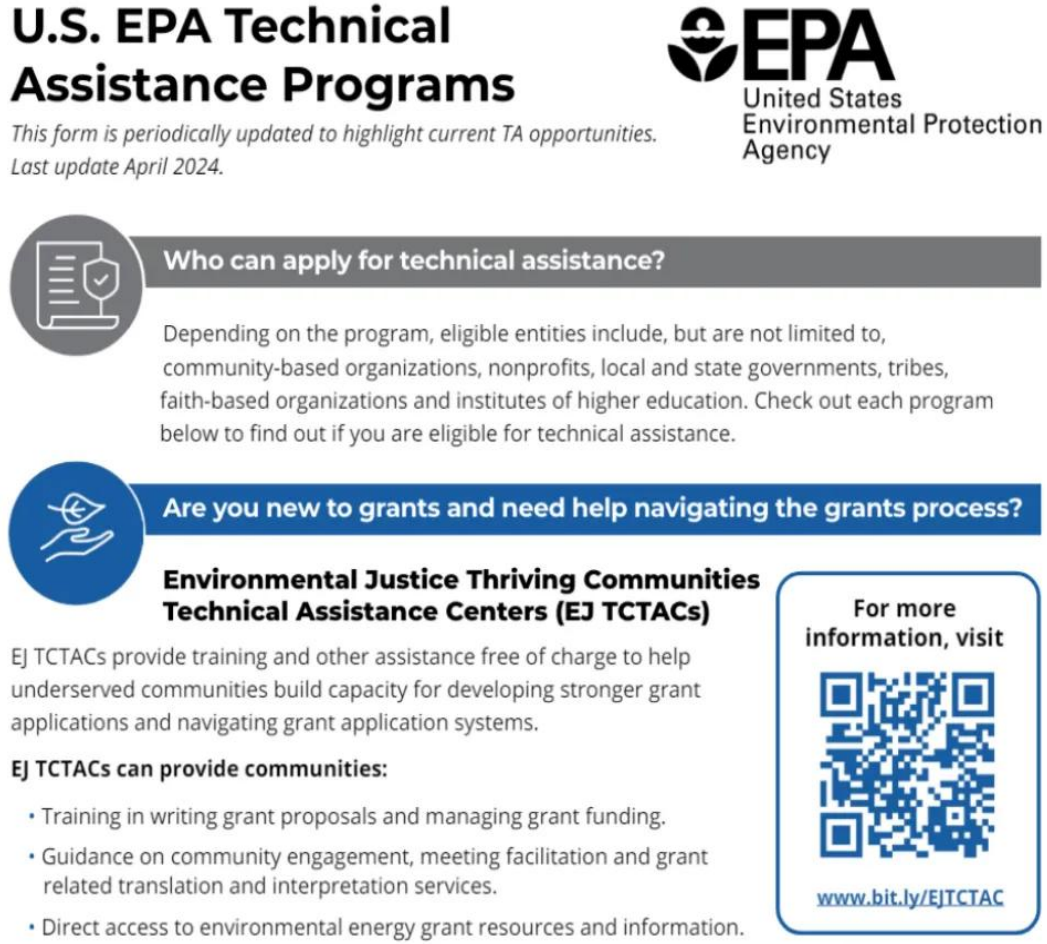
Love Canal: Lessons

The Rise of Independent "Experts"

Love Canal and similar sites (e.g., Hertel Landfill in Plattekill or Jones Sanitation in Hyde Park) imposed on the State (USEPA or NYSDEC) the obligation to identify RPs and to compel RPs to conduct site investigations and, where necessary, to complete remediation.

But an RP-directed investigation or remediation is often quite different from work completed by the State.

Love Canal highlighted the value of third-party oversight to ensure that less-powerful stakeholders received fair consideration.



U.S. EPA Technical Assistance Programs

This form is periodically updated to highlight current TA opportunities.
Last update April 2024.

EPA United States Environmental Protection Agency

Who can apply for technical assistance?

Depending on the program, eligible entities include, but are not limited to, community-based organizations, nonprofits, local and state governments, tribes, faith-based organizations and institutes of higher education. Check out each program below to find out if you are eligible for technical assistance.

Are you new to grants and need help navigating the grants process?

Environmental Justice Thriving Communities Technical Assistance Centers (EJ TCTACs)

EJ TCTACs provide training and other assistance free of charge to help underserved communities build capacity for developing stronger grant applications and navigating grant application systems.

EJ TCTACs can provide communities:

- Training in writing grant proposals and managing grant funding.
- Guidance on community engagement, meeting facilitation and grant related translation and interpretation services.
- Direct access to environmental energy grant resources and information.

For more information, visit

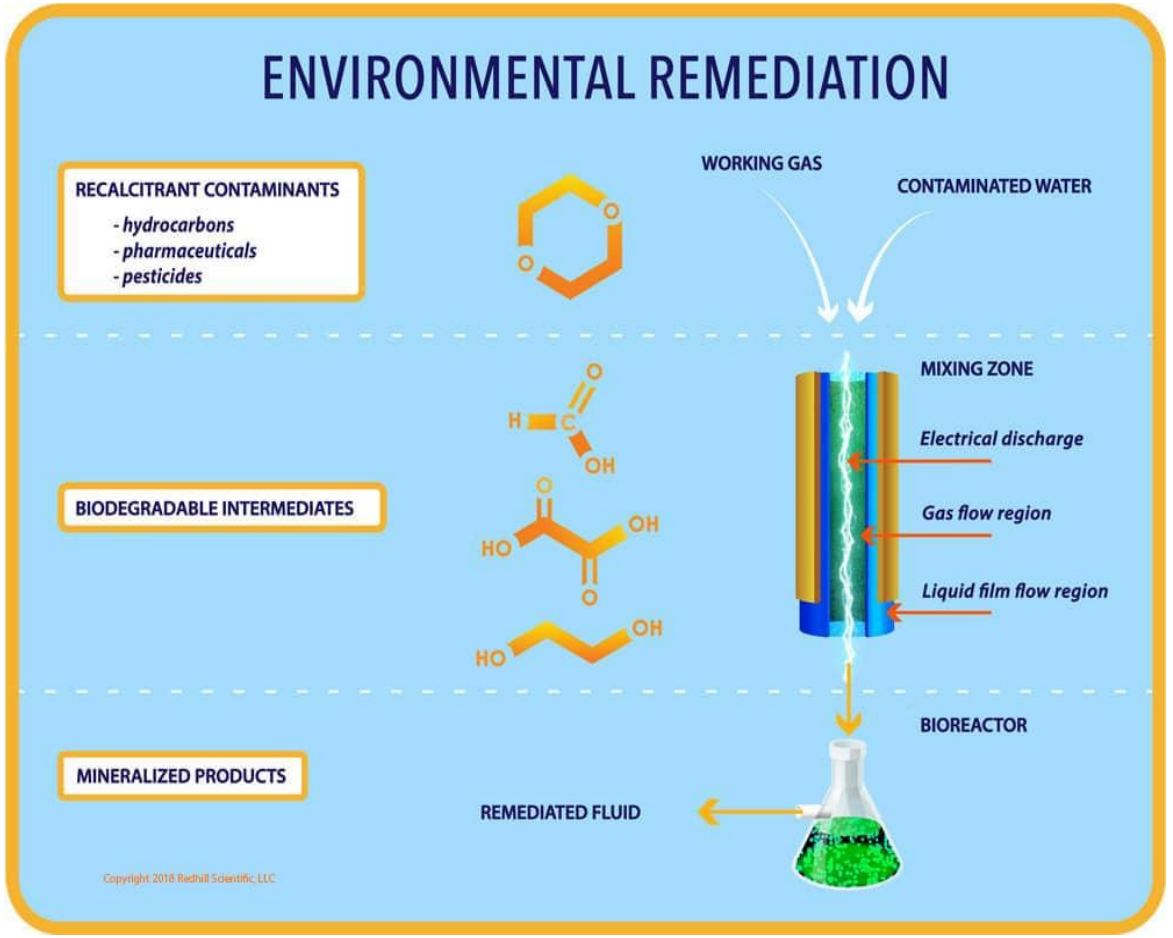
www.bit.ly/EJTCTAC

Love Canal: Lessons

The Rise of Independent "Experts"

The role of independent experts is also critical when we recognize the sheer number of sites subject to investigation (450,000 to 1.5 million).

The USEPA (and corollary state entities) do not have the technical capacity to undertake investigations at all of these sites. Theoretically, the use of outside expertise improves efficiencies and promotes innovation. What may be lost is consistency in scientific rigor.



Love Canal: Lessons

The National Awakening to Toxic Sites in Backyards Across America.

The Environmental Protection Agency warned in 1979: “This is not really where the story ends. Quite the contrary. We suspect that there are hundreds of such chemical dumpsites across this Nation.”

The story of Love Canal was the incentive for the creation of Superfund.



Map is from USEPA website, overlaying Waste sites, Toxic Release locations, and facilities with Air discharge permits.

Love Canal: Lessons

In turn, Superfund was the incentive for State-run remedial programs, including the NYS Brownfield Clean-up Program.

In Dutchess County alone, 161 properties are listed on the NYSDEC database (partial list shown in photo) as either having been cleaned up or subject to future clean up.

Environmental Site Remediation Database Search Results

Record Count: 161 Rows: 1 to 50

Export XLS | Export CSV | Export KML | First 50 | Previous 50 | Next 50 | Last 50

	Site Code	Site Name	Program	Site Class	County	City/town	Address
1	C314070	CH - Water St. - Poughkeepsie MGP	BCP	A	Dutchess	Poughkeepsie	North Water Street
2	C314081	Former A.C. Dutton Lumber Yard	BCP	C	Dutchess	Poughkeepsie	1 Dutchess Avenue
3	C314081A	OFF-SITE Former A.C. Dutton Lumber Yard	BCP	N	Dutchess	Poughkeepsie	1 Dutchess Avenue
4	C314083	Chelsea Waterfront Development Site	BCP	C	Dutchess	Fishkill	5-47 Chelsea Industrial Park (Brockway Rd.)
5	C314107	Beacon Terminal	BCP	N	Dutchess	Beacon	579 South Avenue
6	C314108	PURA-14 Site	BCP	C	Dutchess	Poughkeepsie	36 Pine Street
7	C314109	Former City of Poughkeepsie Sewage Plant	BCP	C	Dutchess	Poughkeepsie	176 Rinaldi Boulevard
8	C314111	Former Drive & Park Inc. Site	BCP	C	Dutchess	Poughkeepsie	28 IBM Road
9	C314112	Long Dock Beacon	BCP	C	Dutchess	Beacon	8 and 23 Long Dock Beacon Road
10	C314113	Love Road Development Site	BCP	C	Dutchess	Poughkeepsie	20-50 Love Road
11	C314114	Nine Mall Plaza	BCP	C	Dutchess	Poughkeepsie	1810 - 1840 Route 9
12	C314115	IBM Building 918/965	BCP	N	Dutchess	Poughkeepsie	2455 South Road (Route 9)
13	C314116	Cornerstone Enterprises Inc.	BCP	C	Dutchess	Pawling	33 East Main Street
14	C314117	Beacon Terminal	BCP	A	Dutchess	Beacon	555 South Avenue
15	C314118	Churchill Mills	BCP	N	Dutchess	Beacon	1 East Main Street

Love Canal: Lessons

The Expanded Role of Legal Recourse for Environmental Redress

It took 11 years of legal wrangling, but finally Hooker Chemical agreed (in an out of court settlement) to pay $159 million to the USEPA to cover the clean-up costs (recall that total project costs have been estimated at $400 million).

But this settlement (and others generated as a result of CERCLA procedures) validated the Superfund process of identifying Responsible Parties and pursuing damages from those entities.

Superfund sites are those listed for federal cleanup

- There may be over 400,000 "Superfund" sites in the U.S.
- Total costs for hazardous waste cleanup in the U.S. are estimated to be between $370 billion and $1.7 trillion.



CONCLUSIONS

The past comes back to haunt us in the form of thousands of contaminated sites containing millions of tons of waste.

USEPA estimates (2021) that there are 450,000 designated and documented contaminated sites in the US (half of these are existing or former gas stations) amounting to 6 million acres of contaminated soil (private estimates consider these numbers to be vastly understated).

There are no aggregate records of the total volume of contaminated soil managed annually.



CONCLUSIONS

But at least some of these sites may contain measurable concentrations of resources capable of being recovered.

The USEPA has identified over 10,000 closed or abandoned municipal waste landfills which contain between 9 and 20 Billion tons of commingled waste.

It is estimated that roughly 10% of buried waste contains recoverable metals, including steel (7.2%) and aluminum (1.8%). As a stockpile, this aluminum represents a 40-year supply.



CONCLUSIONS

Landfills could be reimagined as repositories of stored resources. A 2022 study concluded that closed municipal landfills contained enough aluminum and copper and lead and zinc to make reclamation economically feasible.



CONCLUSIONS

Challenges to Landfill Reclamation are formidable. A 2016 MIT study concluded:

- Costs of resource extraction and separation exceed market values;
- Wastes generated from these reclamation processes (that is, excavated material less separated resource) have significant management costs.

But such actions move us in the direction of a circular economy. Is this at least a partial answer to our garbage problem?

