

C-8 Landfill Sites

Three letters sent to the EPA by DuPont in 2006, 2009 and 2010 detail the sites where C-8 containing materials were dumped. The letters explain where the C-8 material was landfilled using maps, tables and a narrative. We have combined this info in the attached table.

Though it's not included in the aforementioned letters, DuPont's Chambers Works plant also disposed of C-8 containing waste originating at the Washington Works plant. A DuPont document exhibited in the LHWA case says states:

A small amount of non-hazardous waste polymer, water, APFO and other additives generated at Washington Works is treated in a wastewater treatment facility at DuPont's Chambers Works. This material is either emitted in the Chambers Works water discharge or captured on carbon and landfilled in a secure landfill.ⁱ

We want to note that another document exhibited in the LHWA case indicates that C-8 was recycled at a DuPont facility in Fayetteville, NC and at the company's Jackson Lab in Deepwater, NJ.ⁱⁱ

Previous literature has discussed DuPont's disposal of C-8 containing waste at all of these sites.ⁱⁱⁱ

Mitigation Costs

Given our time constraints, it was impossible to generate an estimate of the mitigation costs for each of the sites where DuPont landfilled C-8 waste. Landfill remediation is a complicated process, with various methods and associated cost structures. However, the \$21 million remediation of one Minnesota landfill where the 3M Company dumped PFCs, including PFOA, may be instructive.

In 2004, the Minnesota Pollution Control Agency (MPCA) learned that the 3M Company had disposed of sludge and other wastes containing PFCs at the state's defunct Washington County Landfill in the town of Lake Elmo. Testing during the same year revealed the presence of PFCs, including PFOA, in groundwater at the landfill.^{iv} Onsite, PFOAs were found at a concentration of 82 ug/l^v -- similar to the 87 ug/l detected by DuPont at the "Local Landfill" near Washington Works in 1999.^{vi}

In 2007, the MPCA hired an engineering consulting firm to assess methods for cleaning up the 40-acre landfill. This firm studied several landfill mitigation approaches, including:

- Plasma Torch: Excavate wastes and convert them on-site to gas and inert slag using extremely high- temperature treatment. Estimated costs: \$192,300,000
- Forcemain: Pump groundwater at the site (110 gallons per minute) and discharge it untreated to a force main (sanitary sewer line) which would convey the discharge to a wastewater treatment plant. Estimated costs: \$7,300,000;
- Pump & Treat: Treat contaminated groundwater and discharge (150 gpm) to on-site infiltration basin. Estimated costs: \$5,800,000

- Dig & Truck: Remove all wastes from the landfill and truck them to a licensed disposal facility off-site. Estimated costs: \$66,800,000
- Dig & Line: Relocate all waste in a new, lined landfill at the current site. Estimated costs: \$27,600,000^{vii}

Ultimately, the Dig and Line method was selected.^{viii} As mentioned, the total cost was \$21 million, most of which was borne by the State of Minnesota.^{ix} Although not legally required to contribute, 3M pitched in \$8 million. It was the most expensive landfill cleanup in state history.^x

(In 2010, the State sued 3M over the company's disposal of PFC-containing materials at the Washington County Landfill and other sites, including directly into the Mississippi River. As of January 2014, the case was still active, according to an article in the press.^{xi}).

ⁱ *Voluntary Use and Exposure Information Profile - Ammonium Perfluorooctanoate (APFO)*. Document saved as "APFO Profile."

ⁱⁱ *Briefing Book, DuPont Epidemiology Advisory Board, April 2007*. Document saved as "DuPont_Epidemiology Advisory Board Apr 2007."

ⁱⁱⁱ See for example, Callie Lyons, *Stain-resistant, Nonstick, Waterproof, and Lethal: The Hidden Dangers of C8*, (Westport: Praeger, 2007), pages 147-148. Available through Google Books at <https://books.google.com/books?id=hJdnEzg00IYC&pg=PA147&lpg=PA147&dq=palestine+ohio+DuPont+pascagoula+pfoa&source=bl&ots=dipfKD5cF&sig=yeQOqqP3GBjdHbkA9em9Hv5DGgw&hl=en&sa=X&ved=0ahUKEwj8s5uwsKzJAhXBej4KHSftBpUQ6AEIJDAA#v=onepage&q=palestine%20ohio%20DuPont%20pascagoula%20pfoa&f=false>

^{iv} <http://www.pca.state.mn.us/index.php/view-document.html?gid=2948>

^v <http://www.pca.state.mn.us/index.php/view-document.html?gid=2948>

^{vi} *Voluntary Use and Exposure Information Profile - Ammonium Perfluorooctanoate (APFO)*. Document saved as "APFO Profile."

^{vii} <http://www.pca.state.mn.us/index.php/view-document.html?gid=2947>

^{viii} <http://www.pca.state.mn.us/index.php/view-document.html?gid=2948>

^{ix} www.twincities.com/ci_13182263?source=email

^x www.twincities.com/ci_13182263?source=email

^{xi} <http://www.startribune.com/state-s-lawsuit-against-3m-over-pfcs-at-crossroads/239710011/>

Group 1 Sites

Characterized by DuPont as those sites that received a high level of C-8-containing wastes. With the exception of the Chemical Waste Management Landfill in Emelle, AL, all of these are onsite or nearby the Washington Works facility.

| Site | Location | Est Timing of Disposal | Amount of Approximate Equivalent C-8 |
|------------------------------------|-----------------|------------------------|--------------------------------------|
| Three B Disposal Company Landfill | Parkersburg, WV | 1950-1952 | 450 lbs |
| Chemical Waste Management Landfill | Emelle, AL | 1996-2002 | 18,300 lbs |
| Dry Run Landfill | Washington, WV | 1988-2006 | ≈ 4,500 lbs |
| Local Landfill | Washington, WV | 1964-Mid 1980s | Unknown |
| Latart Landfill | Latart, WV | 1968-1995 | 21,400 lbs |
| Riverbank Landfill | Washington, WV | 1951-1964 | ≈ 2,000 lbs |

Group 2 Sites

Characterized by DuPont as those sites that received an unknown volume of C-8 containing wastes but the company expected the volume to be small.

| Site | Location | Est Timing of Disposal | Amount of Approximate Equivalent C-8 |
|---|------------------|------------------------|--------------------------------------|
| Waste Mgmt's Northwest Landfill | Parkersburg, WV | 1996 - at least 2009 | ≈ 65 lbs |
| Waynesboro Nurseries | Waynesboro, VA | 1979-1981 | N/A |
| Beech Hollow Landfill | Wellston, OH | 2000-2006 | Negligible at measured content level |
| BFI's East Palestine Landfill | Negley, OH | 1976-1978 | Unknown |
| Waste Mgmt's American Landfill (Breitenstine) | Waynesburg, OH | 1983 | Unknown |
| Clermont Environmental Reclamation | Williamsburg, OH | 1977-1981 | Unknown |
| NY TREX, Inc. | Loudeville, OH | 1979-1980 | Unknown |

Group 3 Sites

Characterized by DuPont as sites that received a very small volume of C-8-containing wastes.

| Site | Location | Estimated Timing of Disposal | Amount of Approximate Equivalent C-8 |
|--------------------------------------|----------------|------------------------------|---|
| Waste Mgmt's Meadowfill Landfill | Bridgeport, OH | 1990-2006 | N/A |
| Waste Management's Suburban Landfill | Glenford, OH | 2004 | <0.1 lbs Note: Also received waste containing approx 237 lbs of C-8 from DuPont's Circleville, OH plant from 1996 to 2003. |
| Chemical Waste Management | Fremont, OH | 1978 - mid 1980s | N/A |

Other

These were not included in the final list of sites in DuPont's letters to the EPA. The Sulphur, LA and Fairmont, WV sites were included in an initial letter from DuPont to the EPA in 2006, but dropped from subsequent correspondence on the matter. Other sources show that a portion of PFOA-containing material that was sent from the Washington Works facility to be recycled at Chambers Works was ultimately landfilled at the latter facility.

| Site | Location | Est Timing of Disposal | Amount of Approximate Equivalent C-8 |
|----------------------------------|----------------|------------------------|--------------------------------------|
| Chemical Waste Mgmt | Sulphur, LA | 2005 | Less than 0.002 lbs |
| Waste Mgmt's Meadowfill Landfill | Clarksburg, WV | 1999 - at least 2009 | N/A |
| DuPont's Chambers Works Facility | Deepwater, NJ | ? | ? |