



Clyde Cancer Childhood Cancer Timeline

Agencies Involved:

- Sandusky County Combined General Health District (SCCGHD)
- Ohio Department of Health (ODH) Chronic Disease and Behavioral Epidemiology Section
- Ohio Department of Health Comprehensive Cancer Control Program
- Ohio Department of Health (ODH) Health Assessment Section (HAS)
- Ohio Department of Health (ODH) Bureau of Radiation Protection (BRP)
- Ohio EPA Northwest District Office (NWDO)
- Ohio EPA Central Office
- Ohio State University James Cancer Hospital and Solove Research Institute
- Agency for Toxic Substances and Disease Registry (ATSDR), Region V Office (Chicago)
- CDC/National Center for Environmental Health (NCEH)
- U.S. EPA Emergency Response Branch, Region V

Background:

November 2007 The Ohio Department of Health (ODH) and the Sandusky County Combined General Health District (SCCGHD) responded to concerns of residents from Clyde City and Green Creek Township regarding a perceived high rate of cancer among residents. SCCGHD and ODH Chronic Disease & Behavioral Epidemiological Section met with the families of the Clyde childhood cancer cases and presented the results of the *Cancer Incidence Among Childhood Residents of Clyde City and Green Creek Township, Sandusky County, Ohio 1996-2006*.¹ The community cancer assessment indicated a higher than expected numbers of childhood cancer cases, mainly brain cancers, in the City of Clyde and in portions of adjacent townships in a largely rural portion of eastern Sandusky County. Families at the meeting expressed concerns about possible environmental contamination and requested the involvement of the Ohio EPA and the ODH Bureau of Environmental Health (BEH).

November 27, 2007 During an ODH Comprehensive Cancer Group meeting, the Chronic Disease & Behavioral Epidemiological Section informed the ODH BEH Health Assessment Section (HAS) representative and Ohio EPA representative that there were families at the Clyde cancer meeting who requested both agencies involvement to address their concerns about possible environmental contamination.

December 5, 2007 A multi-agency conference call with the SCCGHD, ODH Chronic Disease & Behavioral Epidemiological Section, ODH HAS, and the Ohio EPA Northwest District Office (NWDO) took place to begin discussions of how we plan to address the directed environmental concerns.

January 17, 2008 Meeting with the impacted families: SCCGHD, ODH Chronic Disease & Behavioral Epidemiological Section, ODH HAS, and the Ohio EPA NWDO staff met with 15+ parents and relatives of children stricken with childhood cancer in the Clyde area. HAS presented *Exposure to Toxic Chemicals*² and discussed the five components of the completed exposure pathway and how all five must be present in order to determine if the community's health may be impacted. SCCGHD officials were present to address local public health activities and ODH's Chronic Disease & Behavioral Epidemiological Section was there to answer specific questions regarding the completed cancer assessment and the follow-up case study. Ohio EPA partners were also present to address specific environmental concerns.

February 2008 Meeting with the impacted families: Ohio EPA met with impacted Clyde families in an attempt to address their identified environmental concerns and questions generated at the January 17th public meeting.

February 29, 2008 Release of the *Clyde City and Green Creek Township area Childhood Cancer Case Review 1996-2006*.³ The case-review was conducted by SCCGHD staff using a standardized questionnaire developed by ODH. The questionnaire gathered information concerning potential exposures to the child during fetal development; medical history; potential exposure in the home environment to chemicals, pesticides, tobacco smoke, etc., parental occupations; drinking water sources; school attendance; history of cancer in the family; and other information to attempt to identify factors that may have played a role in the development of these cancers.

- **Conclusion:** The case-review did not reveal any common or individual factors that may have played a role in these childhood cancers.

September 2008 Following the reports of two additional childhood cancer cases in the Clyde area over the 2008 summer months, the renewed community concerns again centered on the environment as a likely cause – specifically releases of chemicals to air, land and water from two nearby facilities (Whirlpool and the Vickery Environmental deep well injection waste disposal facility).

September 2008 The Agency for Toxic Substances and Disease Registry (ATSDR) Region V Office was contacted by the SCCGHD who requested their assistance. Dr. Michelle Colledge contacted ODH HAS to inquire if there was state involvement in the Clyde cancer site investigation. HAS sent ATSDR colleagues all the information we had on the site and activities to-date. After receiving the ODH cancer assessment (sent Sept. 29th), ATSDR's Region V Medical Officer, Dr. Michelle Watters, contacted ODH HAS with questions and comments.

October 6, 2008 A multi-agency meeting and conference call took place with representatives from the SCCGHD, ODH Chronic Disease & Behavioral Epidemiological Section, ODH HAS, Ohio EPA NWDO, Ohio EPA Central Office and ATSDR Region V Office staff. On this call there were continued discussions regarding the various real and potential sources of chemical releases to the environment. Ohio

EPA discussed sampling drinking water, ambient air, surface water, and conducting a facilities review to examine the compliance histories of area industry. ODH Chronic Disease & Behavioral Epidemiology Section and the SCCGHD discussed revisiting the Case Study questionnaire, focusing more on the histories of the parents rather than the impacted children in their continued search to find any commonalities between these cases.

November 13, 2008 Joint agency meeting: A meeting took place with the ODH and Ohio EPA Directors and staffs to discuss the implementation strategy for a joint Clyde childhood cancer investigation.

December 11, 2008 Meeting with the impacted families: SCCGHD, ODH Chronic Disease & Behavioral Epidemiological Section, ODH HAS, and Ohio EPA staff had a pre-meeting with the parents of the children with cancer to discuss what we would be discussing at the larger December 16, 2008 community meeting. These private meetings with the families provide a smaller venue discussion and allow for an opportunity for the parents to ask questions in private and outside the larger public meeting venue.

December 16, 2008 Public meeting: The Directors from ODH and Ohio EPA attended the public meeting in Clyde to publically discuss our involvement and the planned multi-agency activities to take place as a part of the Clyde cancer investigation.

January 2009 Ohio EPA drinking water sampling and air sampling begins.

January 16, 2009 ODH BEH Indoor Environments Section met with the SCCGHD and reviewed the files of six (6) area schools, reviewing inspection reports for the period 1990-2008. Note that records prior to 2007 are not as comprehensive as those for 2007.

- **Conclusion:** No significant environmental quality or safety issues were identified in the six (6) area schools.

April 7, 2009 One-on-one meetings with the impacted families: SCCGHD, ODH Chronic Disease & Behavioral Epidemiological Section, ODH HAS, and Ohio EPA staff had a private meeting with families to discuss their individual drinking water results.

April 16, 2009 Ohio EPA Division of Drinking and Ground Waters released *Drinking Water Quality Sampling to Support the Ohio Department of Health Childhood Cancer Investigation, City of Clyde and Surrounding Townships April 9, 2009.*⁴ Eleven (11) drinking water samples were collected from two public water systems (City of Clyde and Ohio Rural Northern Water (NORW)), plus water samples from four private wells used by residents with children impacted by these cancers).

- **Conclusion:** The results of the sampling did not identify any components of drinking water that suggest significant carcinogenic health concerns. A few naturally-occurring substances were identified at elevated concentrations in the water well samples. These substances occur naturally in carbonate bedrock aquifers, such as the bedrock aquifer underlying the local area. The naturally

occurring substances that exceed a U.S. EPA secondary maximum contaminant level (MCL) or health advisory level do not have carcinogenic health implications.

April 16, 2009 Meeting with the impacted families: SCCGHD, ODH Chronic Disease & Behavioral Epidemiological Section, ODH HAS, and Ohio EPA staff met with the all the impacted families to discuss the overall drinking water results.

April 20, 2009 Public meeting: SCCGHD, ODH Chronic Disease & Behavioral Epidemiological Section, ODH HAS, and Ohio EPA staff had a meeting with the general community to share new information and discuss the drinking water results, initial ambient air sampling results and the proposed surface water body investigation.

May 28, 2009 *Investigation of Potential Clustering of Invasive Cancer among Children, Adolescents, and Young Adults in Sandusky County, Ohio, 1996-2006.*⁵ ODH, in partnership with the James Cancer Hospital and Solove Research Institute at the Ohio State University, conducted a spatial (geographic) analysis to identify areas of Sandusky County where clustering of childhood cancers is most likely to occur. The were two primary objectives for this analysis: (a) To determine the geographic regions in Sandusky County and the surrounding area where the most likely clustering of cancers among children has occurred; and, (b) To determine the probability (p-value), or likelihood, that the cluster occurred by chance.

- **Conclusion:** The results from the analysis indicate that for Sandusky County the most likely cluster occurred in the eastern portion of Sandusky County including most of Fremont. This cluster had a radius of between 5 to 7 miles and a p-value of less than 0.05, indicating statistical significance, thus the clustering could have occurred by chance alone less than five times out of a hundred.

June 2009 Additional Ohio EPA sampling of drinking water was conducted.

July 24, 2009 Congressman Bob Latta's office sent a letter to the ODH Director of Health, expressing his concerns about the childhood cancer in Clyde, Ohio. ODH Director, Dr. Alvin Jackson, sent a return letter, confirming our concerns and providing Representative Latta with a list of the multitude of activities taking place in the Clyde cancer investigation.

August 19, 2009 *Addendum to Drinking Water Quality Sampling to Support the Ohio Department of Health Childhood Cancer Investigation, City of Clyde and Surrounding Townships.*⁶ During development of the drinking water sampling plan, pesticide sampling was suggested during the late spring application period. When evaluating the historic and recent use of pesticides with the Ohio Department of Agriculture (ODA) and the Sandusky County OSU Extension Service, it was determined that one pesticide chemical group, known as organophosphates, may have been used in the vicinity of Clyde during the past 15 years. Collaborating with the Ohio EPA, ODA collected samples and analyzed for 48 pesticides, including 12 organophosphate chemicals.

- **Conclusion:** The results are consistent with the previous drinking water quality results, with the detection of low-level concentrations of commonly used

pesticides in water which is derived from a stream or reservoir. No pesticides were detected in any of the domestic water well samples or the NORW sample. No pesticide results from a treated drinking water sample exceeded a maximum contaminant level health standard.

October 30, 2009 *Childhood Cancer among Residents of Eastern Sandusky County*⁷ joint progress report October 30, 2009. This joint progress report describes the agency efforts and updates the community on current and ongoing investigations by the ODH, SCCGHD and Ohio EPA.

November 17, 2009 In Oct.-Nov. of 2009, Senator Sherrod Brown's office contacted the CDC to request their involvement in the Clyde cancer investigation. After reviewing ODH's cancer investigation efforts, representatives from CDC's National Center for Environmental Health (NCEH) contacted Sen. Brown's office and briefed his staff that the ODH investigation was "comprehensive and exhaustive" and that no further action was warranted by their agency.

November 19, 2009 *Report on ODH Radiological Screening of 20 Schools in Eastern Sandusky County.*⁸ Radiation surveys were performed at 20 Schools in Eastern Sandusky County by the ODH Bureau of Radiation Protection (BRP). The radiation surveys were performed to identify any area exceeding the investigatory limit of three times (3x) the measured background radiation level.

- **Conclusion:** There were no areas exceeding the limit of three times (3x) the measured background radiation level. The levels of radiation detected were low and did not present a health risk to the students and staff who attended these schools.

May 14, 2010 *Ohio Environmental Protection Agency Air Quality Report for Clyde and Green Springs May 14, 2010.*⁹ Ohio EPA air monitoring efforts began on January 13, 2009 and ended on January 8, 2010. During the year-long air monitoring study, Ohio EPA detected no elevated levels of VOCs or heavy metals. Additionally, air quality in the Clyde and Green Springs area complies with the National Ambient Air Quality Standards as established by U.S. EPA for all criteria pollutants (particulate matter, nitrogen dioxide, ozone, carbon monoxide, lead and sulfur dioxide).

- **Conclusion:** In summary, Ohio EPA studied air quality for a full year in the Clyde and Green Springs area and detected no elevated levels of pollutants that would indicate a public health concern.

June 14, 2010 Ohio EPA Division of Surface Water *Biological & Water Quality Study of the Sandusky Bay Tributaries, 2009.*¹⁰ The Sandusky Bay tributaries study area, including the Green Creek, Pickerel Creek, Raccoon Creek, Mills Creek, and Pipe Creek watersheds was originally part of the lower Sandusky River Total Maximum Daily Load (TMDL) survey area. However, in spring 2009, the decision was made to partition a portion of the survey into a separate smaller study area, assisting with childhood cancer investigation in Eastern Sandusky County.

- **Conclusion:** Chemicals detected in these waters do not pose a health threat to humans who may have incidental contact.

August 4, 2010 *Report on the Ohio Department of Health's Radiological Study Performed for the Eastern Sandusky County Cancer Cluster Investigation.*¹¹ Six (6) radiological studies were performed by the ODH Bureau of Radiation Protection (BRP) as a part of the investigation into determining a cause for the eastern Sandusky County, Ohio childhood cancer cluster. The six radiological studies include: (1) Historical Radioactive Material User Records Search Project (2) Historical Review of Davis Besse Nuclear Power Station (3) Survey of Schools (4) Radiological Screening of Homes (5) Air Monitoring (6) Ohio EPA Sediments from Streams.

- **Conclusion:** In each of the six (6) studies, no radioactive material or radiation fields were identified that would pose a public health concern.

November 2010 Ohio EPA revealed the results of two (2) additional private well samples that were added from the expanded OSU spatial analysis.

- **Conclusion:** No chemicals were detected above the health-based standards.

February 23, 2011 Senator Sherrod Brown sent a letter to CDC's Director Frieden's office (as well as US EPA Administrator Jackson's office), requesting increased involvement from the federal agencies in the Clyde cancer investigation.

March 30, 2011 CDC's Director, Dr. Thomas Frieden, sent a response letter to Senator Brown's office, highlighting their involvement and providing support of agency efforts, efforts they call "comprehensive and exhaustive."¹²

April 14, 2011 *Ohio EPA Soil Sampling*¹³ Ohio EPA Division of Emergency and Remedial Response (DERR). Ohio EPA collected soils from 11 locations in Clyde and Green Creek Township.

May 26, 2011 *Childhood Cancer in Eastern Sandusky County a Profile*¹⁴ A decision was made to expand the 2007 case review to 35 cases in the cancer case area identified in the 2009 Ohio State University cluster analysis. A supplemental questionnaire was developed and administered in 2010 for the expanded profile to include additional questions about possible environmental sources.

July 28, 2011 *Evaluation of Ohio EPA Soil Sampling In Support of the Clyde and Eastern Sandusky County Childhood Cancer Investigation Clyde, Sandusky County, Ohio.*¹⁵ Ohio Department of Health, Health Assessment Section. July 28, 2011.

- **Conclusion:** Based on the soil samples collected by Ohio EPA in April, 2011, soils in the Clyde area are not contaminated with toxic chemicals at levels of public health concern and exposure to the sampled soils currently does not pose a cancer threat to residents, including area children.

July 2012 *Site Assessment Report Eastern Sandusky County Dumps Site Clyde, Sandusky County, Ohio.*¹⁶ U.S. EPA Emergency Response Branch, Region V. July 2012.

- **Conclusion:** U.S. EPA Site Assessment focused on 14 historic dumpsites identified by the Ohio EPA and Clyde-area residents. Based on the soil, groundwater, and soil-gas (vapor) sampling, U.S. EPA does not expect to take any removal action pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq. at any of the sites investigated.

September 2012 *Site Assessment Report for the Whirlpool Park Site, Green Springs, Sandusky County, Ohio.*¹⁷ U.S. EPA - Region 5, Superfund Emergency Response Section. September 2012.

- **Results:** U.S. EPA completed six (6) soil borings at the former Whirlpool Park site. Results for sub-surface soils found polychlorinated biphenyls (PCBs) were present at levels exceeding U.S. EPA Regional Screening Levels (RSLs) for residential properties.

May 2013 *Benzaldehyde Fact Sheet.*¹⁸ ODH, Health Assessment Section. May 2013. In response to a series of questions posed by Alan Mortensen in letter from the Dewsnup, King & Olsen law firm (dated April 10, 2013), ODH HAS created the benzaldehyde fact sheet to address the specific chemical questions.

June 2013 *ATSDR Letter to U.S. EPA.*¹⁹ ATSDR Region V. June 14, 2013. U.S. EPA - Region 5, Superfund Emergency Response Section requested the ATSDR review the Joel B. Hebdon report entitled "PCB Indoor Dust Sampling Plan" and provide a public health opinion on the data contained in this document. **Note:** It should be noted that ATSDR does not generally evaluate attic dust for cumulative airborne or incidental ingestion exposures, since this is not an area where occupants spend significant time.

- **Conclusion:** There are factual inaccuracies in the report regarding the EPA Preliminary Remediation Goals (PRGs) that are used as a comparison to the dust sampling results. For example, **ALL** the Benzaldehyde levels are below the EPA PRGs for this chemical.

August 2013 U.S. EPA *Interim Site Assessment Report for the Whirlpool Park Site*²⁰ Analytical results from the U.S. EPA split sampling of AECOM environmental sampling of the Whirlpool Park site, June 2013.

October 2013 AECOM *Final Site Assessment Report for the Former Whirlpool Park Site*²¹ This report presents the results of an environmental site assessment conducted by AECOM on behalf of Whirlpool Corp. at the Former Whirlpool Park (FWP) site (Township Road 187, Green Springs, Sandusky County, Ohio). The assessment was conducted at the request of the U.S. EPA Region V Emergency Response Branch (ERB) and was prompted by the results of the September 28, 2012 Site Assessment Report.

October 30, 2013 U.S. EPA review of Site Assessment Report for the Former Whirlpool Park Site²² U.S. EPA reviewed the Site Assessment Report submitted by the Whirlpool Corp. contractor (AECOM) and acknowledged the site assessment activities were conducted in accordance with the approved *Final Draft VAP Phase II Work Plan*.

- **Conclusion:** Polychlorinated biphenyls (PCBs) were the only contaminants of concern found to be above regulatory standards. Removal of PCB-contaminated waste is regulated for cleanup and disposal in accordance with 40 CFR §761.61 (see also 40 CFR 761.50(b)(3)).

References:

- (1) [Cancer Incidence among Childhood Residents of Clyde City and Green Creek Township, Sandusky County, Ohio, 1996-2006](#). Chronic Disease and Behavioral Epidemiology Section and the Ohio Cancer Incidence Surveillance System, Ohio Department of Health and the Sandusky County Department of Public Health. Final Report, April 17, 2007.
- (2) [Exposure to Toxic Chemicals](#) Answers to Frequently Asked Health Questions. Ohio Department of Health, Health Assessment Section. Revised 10/28/03.
- (3) [Clyde City and Green Creek Township area Childhood Cancer Case Review, 1996-2006](#). Chronic Disease and Behavioral Epidemiology Section, Ohio Department of Health and the Sandusky County Department of Public Health. Final Report, February 29, 2008.
- (4) [Water Quality Sampling to Support the Ohio Department of Health Childhood Cancer Investigation, City of Clyde and Surrounding Townships April 9, 2009](#). OEPA Division of Drinking and Ground Waters.
- (5) *Investigation of Potential Clustering of Invasive Cancer among Children, Adolescents, and Young Adults in Sandusky County, Ohio, 1996-2006*. Ohio Cancer Incidence Surveillance System/Comprehensive Cancer Control Program. Ohio Department of Health and the Comprehensive Cancer Control and James Cancer Hospital and Solove Research Institute at the Ohio State University.
- (6) [Addendum to Drinking Water Quality Sampling to Support the Ohio Department of Health Childhood Cancer Investigation, City of Clyde and Surrounding Townships](#).
- (7) [Childhood Cancer among Residents of Eastern Sandusky County](#), a joint progress report. ODH, SCCGHD and Ohio EPA. October 30, 2009.
- (8) *Report on ODH Radiological Screening of 20 Schools in Eastern Sandusky County*. ODH Bureau of Radiation Protection (BRP). Final Report November 19, 2009.
- (9) [Ohio Environmental Protection Agency Air Quality Report for Clyde and Green Springs](#). OEPA Division of Air Pollution Control. Final Report May 14, 2010
- (10) *Biological & Water Quality Study of the Sandusky Bay Tributaries, 2009*. Ohio EPA Division of Surface Water. Final Report June 14, 2010.
- (11) *Report on the Ohio Department of Health's Radiological Study Performed for the Eastern Sandusky County Cancer Cluster Investigation*. ODH Bureau of Radiation Protection (BRP). Final Report August 4, 2010.
- (12) *Senator Brown Clyde Final 033011*. Department of Health & Human Services, CDC, Office of the Director. March 30, 2011.

- (13) [*Ohio EPA Soil Sampling*](#). Ohio EPA Division of Emergency and Remedial Response (DERR). Conducted April 14, 2011 – data sent to ODH in May 2011.
- (14) [*Childhood Cancer in Eastern Sandusky County a Profile*](#). A supplemental questionnaire was developed for the expanded profile to include additional questions about possible environmental sources. ODH Comprehensive Cancer Control Program. Final Report May 26, 2011.
- (15) [*Evaluation of Ohio EPA Soil Sampling In Support of the Clyde and Eastern Sandusky County Childhood Cancer Investigation Clyde, Sandusky County, Ohio*](#). ODH, Health Assessment Section. Final Report July 28, 2011.
- (16) [*US EPA Site Assessment Report Eastern Sandusky County Dumps Site Clyde, Sandusky County, Ohio. Site Assessment Report for the Whirlpool Park Site, Green Springs, Sandusky County, Ohio*](#). U.S. EPA - Region 5, Superfund Emergency Response Section. July 2012.
- (17) [*Site Assessment Report for the Whirlpool Park Site, Green Springs, Sandusky County, Ohio*](#). U.S. EPA - Region 5, Superfund Emergency Response Section. September 2012.
- (18) [*Benzaldehyde Fact Sheet*](#) ODH, Health Assessment Section. May 2013.
- (19) [*ATSDR Letter to U.S. EPA*](#). ATSDR Region V. June 14, 2013.
- (20) [*Interim Site Assessment Report for the Whirlpool Park Site*](#) U.S. EPA split sampling of the Whirlpool Park site. June 2013.
- (21) [*Final site assessment report for the Whirlpool Park Site*](#). AECOM environmental site assessment at the former Whirlpool Park. October 29, 2013.
- (22) [*EPA review of Draft Site Assessment Report for the Former Whirlpool Park Site*](#). U.S. EPA letter response to the AECOM *Site Assessment Report*. October 30, 2013.

Disclaimer:

Make note that some of the documents are ODH-produced documents and some are Ohio EPA and/or federal agency documents. As some of these documents are housed on other agency Web sites, hyperlinks may be broken. For documents originating from sources other than Ohio Department of Health, we encourage you to contact the agency that created the document if you would like a copy.

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