

December 22, 1982

CHRONOLOGY OF DIOXIN INCIDENTS IN MISSOURI

<u>Date</u>	<u>Event</u>
May 1968-Feb. 1969	Hoffman-Taff was producing 2,4,5-T for military (U.S. Army), production wastes disposed by Conservation Chemical Co.
November 18, 1969	Hoffman-Taff leased building in Verona, Missouri to NEPACCO.
December 1969	Syntex acquired Verona facility from Hoffman-Taff.
April 15, 1970 (through January, 1972)	NEPACCO started production of hexachlorophene--2,4,5-TCP distilled to make hexachlorophene--dioxin formed in TCP production--still bottoms contained TCDD.  Three wastes streams were disposed of as follows: (1) still bottoms--two shipments of approximately 6000 gallons each were incinerated by Rollins Environmental Service Co. (nee Rollins Purle, Inc.) in Baton Rouge, LA; six shipments of approximately 3000 gallons each were removed by Bliss Waste Oil Co.; approximately 4300 gallons remained in storage tank at Verona Facility;  (2) wash water waste--between 225,000 gallons and 540,000 gallons were transported by National Oil and Supply Co. to the Water and Waste Management School in Neosho, MO for treatment and disposal; an additional unestimated amount was discharged to on-site lagoons at the Syntex plant in Verona;  (3) diatomaceous earth filter material--majority of unestimated amount disposed at Baldwin Park (nee Aurora municipal dump) with lesser amounts taken by local farmers (Denney, Erwin, and Rusha farm sites).
November 30, 1970 (through December 4, 1970)	Initial waste from NEPACCO production was taken to Rollins in Baton Rouge, LA for incineration--12,600 gallons still bottoms.
Late '70 or Early '71	Russell Bliss was hired by Independent Petrochemical to haul waste from Verona.

**CONFIDENTIAL**  
SUBJECT TO PROTECTIVE ORDER.

004002



- February 16, 1971 Bliss picked up first load of NEPACCO waste, mixed waste with waste automotive oil in storage tank, ultimately sold as salvaged oil to one of two refiners (Midwest Oil and Refinery or M.T. Richards Co.); est. 3000 gallons.
- March 23, 1971 NEPACCO caught fire.
- April 1-8, 1971 Syntex closed their #4 and #5 trenches.
- May 20, 1971 Russell Bliss removed 3,500 gallons of still bottoms. Truck ticketed as being overweight. Delbert Eskew, driver for Bliss, off-loads about 500 gallons of still bottoms on road at Bliss farm (reportedly without spray attachment) to reduce weight before continuing on to St. Louis. Shortly thereafter, 70 chickens and 1 dog die. The Bliss farm consists of about 90 acres and is located in N1/2, Sec 12, T38N, R6W, Phelps County.
- May 25, 1971 Bliss removed 3,000 gallons of still bottoms used almost entirely to "oil" Shenandoah Arena at Moscow Mills (Lincoln County) for dust control. Gary Lambarth, driver for Bliss, sprayed arena with 2,000 gallons of what appears to be straight still bottoms containing approximately 306-356 ppm dioxin for an estimated total dose of 6.1 lb TCDD; remainder applied to Bliss' Mid-America arena in Ellisville.
- May 26, 1971 First horse became sick. From this date on, 62 horses belonging to Piatt and Hampel, plus 12-13 other horses, die or are destroyed.
- May 30, 1971 Hundreds of sparrows were found dead on floor of arena at Shenandoah Stables; horses became ill. During next few weeks, more wild and domestic animals affected with most of them dying; human illness noted during horse show this date.
- June 11, 1971 Bliss oils Bubbling Springs Arena at Fenton (St. Louis County). Arena 115' x 224' in size.
- June 16, 1971 Bliss oils Timberline Stables near New Bloomfield (Callaway County). Arena 78' x 138' in size.
- July 1971 NEPACCO took material to Denney Farm.
- July 1971 Shortly after oiling at Timberline Stables, animals began to die. The first of these was a cat which developed sores around the eyes and began losing hair. Five more kittens died shortly thereafter. A dog, many birds, mice, and an opossum also died during this period of time.

July 15, 1971  
Piatt and Hampel of Shenandoah Arena suspicious about "oil"--called Bliss--no indications of source or problem with "oil".

July 30, 1971  
Bliss removed 3,000 gallons of still bottoms. May have been sold as salvaged oil to one of two refiners.

August 21, 1971  
CDC memo 8-24-71  
Appendix 2  
Document #1  
Six-year-old daughter of Shenandoah arena co-owner develops and exhibits hemorrhagic cystitis and is admitted to St. Louis Children's Hospital the following day.

August 22, 1971  
Hampel (owner) cleared out Shenandoah arena, stopped horse shows, Hampel removed 6 to 8 inches of soil which was placed in new highway fill in front of stables. Estimated about 350 yards of contaminated soil. Fresh soil put back in arena.

August 23, 1971  
CDC memo 8-24-71  
Appendix 2  
Document #1  
Division of Health notified by the Centers for Disease Control (CDC) of contact from girl's physician requesting assistance; Division of Health issues invitation to CDC to participate in an investigation of situations. Symptoms of human illness resolve with cessation of exposure to arena; horses continue to sicken and die until January 1974 when almost all of the 85 horses originally exposed have died.

August 1971  
CDC took soil samples at Shenandoah Arena.

September 8, 1971  
NEPACCO denied, by Syntex, further use of lagoons on Syntex property.

October 1971  
Shenandoah Stables arena excavated again by Hampel to depth of 12 inches and refilled with "clean river bottom soil"; excavated soil put in road fill for U.S. Highway 61, then under construction immediately adjacent to stable property.

October 4, 1971  
Bliss removed 3,000 gallons of still bottoms.

October 25, 1971  
Bliss removes last 3,000 gallons of still bottoms for total estimated 18,500 gallons.

October 30, 1971  
National Oil and Supply started trucking wastewater to Neosho Digester at Water and Wastewater Technical School, a total of 225,000 gallons.

November 1971  
Hampel & Piatt started bringing horses back in to Shenandoah Stables. Animals continue to get sick and/or die.

Late 1971

A three-year-old boy who lived at the Timberline arena in 1971 developed chloracne, "gastrointestinal illness with nausea, vomiting, and abdominal pains. He also complained of headache." Symptoms first appeared six weeks after arena was treated with contaminated oil. Was first seen by doctor in July 1972.

January 10, 1972

NEPACCO made last batch of Hexachlorophene.

Early 1972

Two horses died at Bubbling Springs Arena.

February 8, 1972

Additional TCDD-contaminated wastewater taken to Neosho.

April 1972

Hampel removed 790 to 1,060 yards of soil and placed in slough area adjacent to stables at Shenandoah Stables. Chemical odor still present when area wetted down.

July 1972

A veterinarian, from the School of Veterinary Medicine, UMC, obtained a soil sample from the Timberline arena for analysis. The protective equipment that he was wearing left part of his face exposed. A "gas" that was emanating from the soil burned the subject's face, from which he had "keratoses" for at least one year.

August 4, 1972

At Timberline Stables, approximately 12" of contaminated soil (400 yards) removed and buried in a Jefferson City sanitary landfill. In all, 12 horses died at this arena. At least two other animals became ill and recovered.

August 14, 1972  
 CDC Memo 8/14/72  
 Appendix 2  
 Document #2

"Final" report of investigation at horse arenas issued by CDC; no clear-cut toxicant identified, but some unknown organphosphorus compound implicated.

Late 1972

Three more horses die at Bubbling Springs Arena.

March 1973

Vern Stout excavated soil (approximately 850 yards) from Bubbling Springs arena and used as fill at two locations including Minker residence and Vern Stout residence.

August 1973

Seventh and final horse dies at Bubbling Springs Arena. This animal had been sick for a year. Six other sick horses recover.

Nov.--Dec. 1973

Shenandoah Arena sold by Piatt & Hampel, to Marlène Hudsteth & Bob Grizzle.

March 4, 1974  
 DGLS Letter 3-7-74  
 Appendix 2  
 Document #3

Dr. Jim Williams of the Division of Geology and Land Survey (DNR) shows concern about conditions at Hoffman-Taff (Syntex) property.

July 1, 1974 Dept. of Natural Resources (DNR) was established as a result of State Reorganization Act.

July 15, 1974 At Timberline a three-year-old gelding horse died. Autopsy showed "emaciation, dermatitis on both hind fetlocks, defuse, suppurative pleuritis, and ulcerative gastritis."

July 30, 1974 Shenandoah Arena samples collected by CDC in August 1971 found to yield the following results:  
 TCP 0.56 to 0.6 percent (5,600 to 6,500 ppm)  
 TCDD 31.8 to 33 ppm  
 PCB 1,350 to 1,590 ppm

August 2, 1974 CDC informs Division of Health of latest findings and accepts invitation from Dr. Denny Donnell, State Epidemiologist, to participate in renewed investigation. CDC followed up with memo on August 8.  
 CDC Memo 8/8/74  
 Appendix  
 Document #6

August 2, 1974 DOH contacted Russell Bliss concerning spraying of Shenandoah Stable with toxic substances.  
 DOH Memo 8-5-74  
 Appendix 2  
 Document #4

August 3, 1974 Heath (CDC) shows concern for future health effects studies concerning persons exposed to toxic substances in Lincoln County.  
 CDC Memo 8-5-74  
 Appendix 2  
 Document #5

August 8, 1974 Two EIS physicians (Drs. Coleman Carter and Matthew Zack) from CDC are met in St. Louis by Dr. Patrick Phillips, then Division of Health Public Health Veterinarian; after reviewing previous investigation and updates, began current phase of field investigation by traveling to Shenandoah Stables near Moscow Mills and talking with Marlene Hudsteth (present co-owner with Bob Grizzle) concerning previous dioxin incident; obtained current information on animal and human health and samples of soil and wood from arena.

August 9, 1974 Phillips informed Carter and Zack of probable involvement of Timberline Stables near New Bloomfield because of similar illnesses in horses and spraying of arena by Bliss Waste Oil in 1971; Carter and Zack informed Phillips of origin of TCDD in TCP production; investigation planned.

August 10, 1974 Phillips, Carter and Zack traveled to Timberline Stables and interviewed Robert Hand (owner) and Hamp Ford (attorney) concerning animal and human illnesses experienced in 1971; obtained history of arena, including excavation, and names of contacts for further information on human illnesses.

August 11, 1974

Phillips, Carter and Zack met with Judy Piatt and reviewed original information on dioxin incident at Shenandoah Stables; explained toxicity and effects of TCDD and referred all exposed originally to family physicians for evaluations; updated information on health condition of animals and humans; received information of private investigation of Bliss Waste Oil Co. by Piatt and Hampel.

August 12, 1974

Carter and Phillips interviewed Russell Bliss and obtained lists of sources (other than service stations) of wastes in 1971 and sites and dates of "oiling" in 1971. Obtained samples from Mid-America Arena and soil by storage tanks. Results of analysis showed 0.15 ppm TCDD from Arena sample. Arena reportedly never excavated-- Bliss did not report any deaths of horses. Bliss indicated sprayed arena once a month between 1960-1974.

August 13, 1974

Carter and Zack telephoned waste sources as supplied by Bliss to ascertain possible TCP production but no success; Phillips telephoned sites "oiled" by Bliss and discovered that Bubbling Springs Ranch had similar horse illnesses as two other arenas.

August 14, 1974

Phillips interviewed various members of Bubbling Springs Ranch and obtained information on animal and human illnesses; also obtained information on subsequent disposal sites of excavated arena soil; interviewed Vern Stout and Valerie Minker concerning soil excavated from Bubbling Springs Ranch arena and learned that soil was deposited at Minker residence in March 1973; informed both of probable dioxin contamination and obtained samples of soil for analysis. Samples at Stout residence found to contain 0.44, 0.43, 0.17 ppm TCDD. Samples at Minker residence found to contain 0.085, 0.38, and 0.74 ppm TCDD.

August 15-16, 1974

Phillips finished calling sources of wastes and sites of oiling with no further success or discoveries; Carter and Zack return to CDC in Atlanta with samples for analysis.

August 19, 1974

Carter and Zack (CDC) contact various chemical producers with no apparent success.

August 20, 1974

Carter contacted the Defense Contract Administration Services Regional Office in St. Louis for information on companies once under contract to the U.S. Army for production of 2,4,5-T; in Missouri, these companies were Monsanto, Thompson

Hayward, Hoffman-Taff and Thompson Chemical Company; after contacting and questioning each company on disposal of wastes via Bliss Waste Oil, it was learned that NEPACCO (North East Pharmaceutical and Chemical Co.) had bought equipment and leased plant space from Hoffman-Taff (since acquired by Syntex Agribusiness, Inc.) and had used Bliss for disposal of some of its wastes; it was also learned that a tank containing approximately 4300 gallons of distillation residue wastes from NEPACCO's operation was still existant on Syntex plant property at Verona.

August 23, 1974

Zack interviewed Edwin Michaels, President of NEPACCO, about production history of Verona plant and disposal of wastes; also interviewed Rick Bagby, former plant manager for Syntex's Verona plant about NEPACCO's operation.

August 24, 1974

CDC Report 8-24-74

Appendix 2

Document #7

CDC summarizes dioxin incident in Weekly Report.

August 26-28, 1974

Zack had further conversations with Rick Bagby and Bill Ray, plant manager of NEPACCO plant in Verona; Ray confirmed use of Bliss Waste Oil to dispose of wastes; also spoke with a Dr. Layton of Water and Waste Management School near Neosho concerning certain wash water wastes from NEPACCO's operation and learned that approximately 150,000 gallons of these wastes were received and put into an old sewage digester tank at the school; much has evaporated, leaving a tarry residue, and tank was being filled with debris and soil from new sewage plant construction site.

August 28, 1974

Zack again spoke with Edwin Michaels concerning disposal of NEPACCO Verona plant wastes via Bliss Waste Oil; Michaels could only recall disposal company but promised to review plant records; also contacted Russell Bliss to verify allegation that he received chemical wastes from NEPACCO plant at Verona; Bliss stated that he had recalled a contract with Independent Petrochemical Co. to haul waste material from a company in Springfield area in 1971; Bliss also said that some of this waste material was sprayed on his farm near St. James.

August 29, 1974

Michaels called Zack with further information on waste disposal from Verona plant; three compaines were involved: Rollins Purle Inc., Independent Petrochemical Co., and National Oil and Supply Co.

August 30, 1974

Carter/Zack had further conversations with Dr. Layton concerning delivery of NEPACCO wastes at Water and Waste Management School in 1971-72; also talked with W. L. Gears, manager of National Oil & Supply Co., about disposal of wastes from Verona plant; Gears confirmed transport of waste from NEPACCO plant in Verona to Water and Waste Management School in Neosho; also interviewed a Mr. Calcaterra of Independent Petrochemical and learned that they had sub-contracted to Bliss Waste Oil for removal and disposal of wastes from NEPACCO's Verona plant; then contacted Bliss again for actual dates of removal, which he related as February 16, 1971, May 20 and 25, 1971, July 30, 1971, and October 4 and 25, 1971; Bliss stated that IPC gave him sample of waste which he later discarded; Bliss remembered that wastes had "stuffy creosol smell" and were "very heavy."

August 31, 1974

Phillips (DOH), Carter and Henning Eklund (CDC Industrial Hygienist) traveled to Syntex Agribusiness Inc. plant in Verona, former site of NEPACCO operations, and spoke with Godfrey Moll, Syntex V-P in charge of operations, and Bill Ray; historical information pertaining to Hoffman-Taff's 2,4,5-T production for the U.S. Army and subsequent NEPACCO hexachlorophene production was obtained; also samples of NEPACCO still bottoms waste were collected for analysis. Two soil samples were collected on Bliss farm road by CDC investigators show 0.46 and 0.61 ppm TCDD.

August 1974

CDC collects samples at Timberline. Trace amounts of TCP found.

August 1974

At Shenandoah Arena, (CDC) samples collected from arena floor found to contain a trace amount of TCP and no detectable concentrations of TCDD or PCB.

August 1974

Bubbling Springs Arena sample negative, handwritten notation in CDC notes indicates "trace (?)."

September 4, 1974

Zack talked with Lyle Jordan, marketing representative for Rollins Environmental Service Co. in Baton Rouge, LA, about "still residues" wastes from NEPACCO plant in Verona; this was confirmed by Jordan who said that the waste load was incinerated at Rollins plant in LA; also spoke with Glen Gettinger, manager of Midwest Oil and Refinery Co., about nature of operation and disposal of oil from Bliss Waste Oil Co.; Gettinger stated that refinery's clay filter material was all disposed at Simpson Sand and Gravel Co.; Carter spoke with Bliss again concerning deposition of dioxin wastes on his farm near St. James; Bliss said that truck received ticket at weigh station

outside Springfield for being overweight at end of May 1971; Bliss claimed that the driver was Delbert Eskew and that Eskew sprayed the wastes on Bliss's farm so as not to be overweight at the next weigh station.

September 6, 1974

Interview with Mr. Richards of M.T. Richards, Co., Crossfield, IL; sludge from refinery process spread on oil field roads, usually within two mile radius of plant area; samples collected for analysis from oil field roads.

September 10, 1974

Information obtained from Missouri Division of Motor Vehicles reveals that an overweight citation was issued to Delbert Eskew, driver of Bliss Waste Oil Co. truck, at Stafford weigh station on May 20, 1971; truck left weigh station without reducing its load; truck subsequently stopped at Bliss Farm near St. James and emptied some of the wastes on dirt farm road before continuing trip to St. Louis.

September 11, 1974  
Draft Memo 9-11-74  
Appendix 2  
Document #8

Phillips' memo to Dr. Donke (DOH Director) with preliminary report of investigation. Memo emphasized "draft" nature of report and that investigation was continuing.

October 2, 1974  
CDC letter, 10-2-74  
Appendix 2  
Document #9

Heath's letter to Dr. Donnell expressing concern for safe and prompt destruction of remaining wastes in storage tank at Verona facility; suggested incineration of wastes with deep-burial of tank after sealing and marking; recommended appropriate handling safeguards and that persons involved with disposal be properly informed of hazard posed by TCDD.

October 30, 1974  
CDC Letter 10-30-74  
Appendix 2  
Document #10

Carter's letter to Phillips outlining cornerstones for effective hazardous waste management legislation.

December 2, 1974  
DOH Memo 12-2-74  
Appendix 2  
Document #10a

Donke requests ideas for legislation on hazardous waste management.

January 1975

DNR initiates hazardous waste project which was primarily a survey of current hazardous waste generators to determine type and quantity of waste being generated.

February 24, 1975  
DOH Memo 4/4/75  
Appendix 2  
Document 11

Press release announcing Syntex's intention to find a "permanent solution to the problem" in Verona.

Mid-March 1975

Phillips' telephone conversation with Jim Whitley of Department of Conservation advising him of dioxin investigation and NEPACCO's Verona plant.

March 31, 1975  
CDC Report 3-31-75  
Appendix 2  
Document #12

Publication of CDC final report of investigation; copies transmitted to Department of Natural Resources, Department of Conservation and Kansas City Regional Office of Environmental Protection Agency (EPA); report recommended, among other things, excavation of fills at Minker and Stout sites and removal to landfill, and destruction of wastes in storage tank. Report indicates half-life of dioxin is approximately one year.

April 4, 1975

Phillips provided Domke an outline of legislation for hazardous waste management.

April 4, 1975  
DOH Memo 4/4/75  
Appendix 2  
Document #11

Phillips updates Domke (DOH director) concerning the dioxin investigation.

April 17, 1975

Letter from Missouri Division of Health to Solid Waste Representative, EPA - Region VII providing state report on investigation of arenas.

April 29, 1975  
DOH Memo 4-29-75  
Appendix 2  
Document 12a

Domke encourages working with DNR on legislation.

April 1975  
(to March 1976)

Phillips met with EPA, Department of Natural Resources and Syntex officials in efforts to effect disposal of tank wastes; interviewed various producers of incineration systems and operators of commercial incinerators in attempt to solve problem.

May 16, 1975  
Science Article  
5-16-75  
Appendix 2  
Document #13

CDC and DOH personnel author paper in science Vol. 188 concerning dioxin at Missouri Horse Arenas.

May 16, 1975  
DNR Memo  
5-16-75  
Appendix 2  
Document #14

Joe Eigner (Director of DNR Hazardous Waste Project) updated Kenneth Karch (Director, DEQ) on the dioxin problem. Recommends DOH to continue investigation and DNR to draft legislation concerning hazardous waste disposal.

June 11, 1975  
AG Memo  
6-11-75  
Appendix 2  
Document #15

Bob Lindholm (AG office) informed Kenneth Karch that precautionary action should be taken to prevent harm to residents where Bubbling Springs arena soil had been used as landfill.

July 24, 1975  
 DNR Memo  
 7-24-75  
 Appendix 2  
 Document #16

Robert Robinson (Director of Solid Waste Management Program, DNR) and Joe Eigner updated Kenneth Karch on dioxin investigation. Recommendation made to have CDC resample soil at Stout and Minker property and wells in area be sampled for dioxin. Also questions as to whether soil removal is needed three years after the fact if dioxin has a half-life of one year.

June-July 1975

State investigation continues.

March 5, 1976  
 DOH Memo 3-5-76  
 Appendix 2  
 Document #16a

Phillips contacted by Dr. Ralph Ross of EPA concerning detection of dioxin in beef fat tissue samples from three Missouri counties; after checking with known and potential dioxin sources and Division of Geology and Land Survey, concluded that source of dioxin in beef fat tissues probably not related to NEPACCO incident.

March 1976

EPA, DNR and DOH continue to confer with Syntex officials about latest efforts to incinerate tank wastes; ultimately realized that transport out-of-state was impossible due to lack of cooperation of intervening states and states of possible receipt.

April 9, 1976  
 EPA VII Letter  
 4-9-76  
 Appendix 2  
 Document #17

Jérôme Svore (Regional Administrator of Region VII of EPA) informed Robert Lindholm (AG's office) that EPA, DOH, DNR and Syntex are continuing to look for disposal options. Svore also suggests land burial as an option.

April 14, 1976  
 AG Memo  
 Appendix 2  
 Document #18

Bob Lindholm informed Phillips of land burial option and adds that this would not be a "long term" option.

August 1976

At Shenandoah Arena, dog named Scotty died after unearthing leg of horse buried on property.

September 1976

Phillips returned to Minker/Stout sites - noted that soil was stable - took new samples and sent them to CDC.

September 8, 1976  
 DNR Letter  
 9-8-76  
 Appendix 2  
 Document #19

Joe Eigner informed Bertha Parsons (concerned citizen) that the EPA and DOH are looking for alternatives for the disposal of the dioxin waste in Missouri. Also that DNR is assisting DOH in the investigation. DNR is also proposing legislation to prevent this situation from reoccurring.

September 29, 1976  
 CBNS Paper  
 9-29-76  
 Appendix 2  
 Document #20

Barry Commoner publishes report entitled Accidental Contamination of Soil with Dioxin Missouri: Effects and Countermeasures. Paper outlines investigation and states that half-life of dioxin in soil is between 1 year and 0.24 year. Recommends further study.

October 1976 DNR and League of Women Voters organize pre-legislative session conference on proposed state Hazardous Waste Management Bill sponsored by Rep. Wayne Goode; Phillips re-samples Minker and Stout sites.

1976 Toxic Substances Control Act (TSCA) and Resource Conservation and Recovery Act (RCRA) passed; state law drafted.

1976 Syntex begins work on disposal options - contents of tank at Syntex's Verona facility is major concern because of 343 ppm concentration of TCDD.

December 1976 Missouri Legislative Conference on Hazardous Waste; Missouri House Bill (318) pre-filed.

January - June 1977 DNR continues working on Hazardous Waste Management Bill being considered by legislature.

July 1977 Passage and enactment of Missouri Hazardous Waste Management Act, requiring registration of generators, licensing of transporters and permitting of disposal facilities, with definitions (RSMo 260.350 through 260.430, 1978).

August 1977 More meetings between Department of Natural Resources, Division of Health, EPA and Syntex concerning destruction/disposal of tank wastes; Syntex official (Godfrey Moll) reported on investigation of new process called photolysis which involves ultraviolet light to strip chlorine atoms off dioxin molecule, thereby de-toxifying the compound; as more research completed, photolysis technique became more and more promising; finally decision reached to destroy dioxin-compound of tank wastes by photolysis in September of 1979.

September 6, 1977  
DOH Memo 9-6-77  
Appendix 2  
Document 20a Domke encouraged incineration of dioxin.

October 1977 Missouri Hazardous Waste Management Law signed by the Governor.

April 1978 Hazardous Waste Management Commission appointed by Governor; DNR begins drafting Hazardous Waste regulations.

May 30, 1978  
 EPA Letter  
 5-30-78  
 Appendix 2  
 Document #21

EPA Region VII informed Robbie Robinson (Director of Solid Waste Management Program in MDNR) that the request for EPA mobile incinerator to be used to destroy waste dioxin at Verona was being processed.

December 14, 1978  
 Governor's Letter  
 12-14-78  
 Appendix 2  
 Document #22

Governor Teasdale wrote letter to U.S. Senators Stafford and Muskie stating that Missouri is attempting to implement the new state Hazardous Management Law which primarily addresses current generation of hazardous wastes and prevention of future problems. Governor supports passage of Superfund Law to deal with clean-up and emergency cases.

February 21, 1979  
 DOH Memo 2-21-79  
 Appendix 2  
 Document #23

Memo from Dr. Donnell to Joseph B. Reichart (Acting Director, Division of Health) regarding status of dioxin.

February - June 1979

Several letters between Kay Camin (EPA Admin. Region VII) and Jim Odendahl (Director, DEQ, DNR) regarding possible use of EPA mobile incinerator for Verona dioxin wastes.

March 29, 1979

EPA initiates detailed review of detoxification process for TCDD wastes.

September 11, 1979  
 EPA Letter  
 9-11-79  
 Appendix 2  
 Document #24

EPA Region VII informed DNR that EPA is still looking into incineration of dioxin options.

October 1979  
 DOH 11-7-79 and  
 11-8-79  
 Appendix 2  
 Documents #25, 26

EPA receives anonymous phone call alleging other sites in southwestern part of the state that received NEPACCO wastes; follow-up investigation led to Denney Farm site, Baldwin Park in Aurora, Water and Waste Management School near Neosho, Crider-Erwin-Ray-Rusha Farms near Verona, and the Spring River. DOH makes recommendations to DNR.

October 2, 1979

OSHA refers complaint of uncontrolled waste dumping to EPA related to Denney Farm site.

October - November 1979

EPA conducted detailed investigation of Denney Farm site.

November 19, 1979  
 DNR Memo 11-19-79  
 Appendix 2  
 Document #27

DNR responds to DOH/DSS memo of 11-8-79 regarding activities at southwest Missouri dioxin sites.

November 19, 1979  
 DNR Memo 11-27-79  
 Document #28

EPA briefing for OSHA and state on southwest Missouri dioxin sites.

November 1979	Results of Missouri Hazardous Waste Survey published, reporting that over 1 million tons of hazardous waste were being produced in Missouri annually.
December 12, 1979	Meeting between Syntex, DNR, DOH, Occupational Safety and Health Administration, National Institute for Occupational Safety and Health, Hydrosience Inc., and U.S. EPA (Region VII) regarding methods of dealing with Verona dioxin wastes.
January 1, 1980	Missouri Hazardous Waste Regulations become effective.
March 21, 1980 Syntex Letter 3-21-80 Appendix 2 Document #29	Syntex letter to Jim Odendahl (Director, DEQ) informing DNR that Syntex will begin detoxification process in May 1980.
March 26, 1980 DNR Letter 3-26-80 Appendix 2 Document #30 DNR Memo 4-29-80 Appendix 2 Document #31	Odendahl wrote Kay Camin (EPA Region VII) informing EPA that "I view the dioxin disposal issue in two separate but interrelated parts. 1) The dioxin destruction program proposed by Syntex for the still bottom residues stored on their property and; 2) the investigation of the abandoned dump site referred to as 'Farm Site 1'." Carolyn Ashford, Chief of Staff Governor's Office, also informed.
April 1980	Denney Farm site sampled by EPA.
May 13, 1980	DNR memo briefing Carolyn Ashford, Governor's office, on detoxification of tank at Verona.
May 19, 1980	At Verona, detoxification of Syntex tank is begun by use of photolysis, with EPA approval.
June 6, 1980	Briefing for southwest Missouri physicians on health effects of dioxin given by Dr. John Neuberger (Ph.D.), consultant with EPA, and Dr. O. A. Griffin, health official in Missouri Division of Health District 5 office.
July 1, 1980	Compliance with Missouri Hazardous Waste Regulations required.
July 14, 1980 DOH Memo 7-14-80 Appendix 2 Document #32	DOH sends information on dioxin to district offices.
August 1980	Detoxification of tank materials completed by Syntex.

September 1980	EPA signs consent agreement with Syntex on cleanup of Denney Farm; Denney Farm cleanup begins.
September-October, 1980	Special legislative session to consider changes to HWMA.
September 9, 1980 DNR Report 9-9-80 Appendix 2 Document #32	Report from Fred Lafser, Director of DNR, <u>Hazardous Waste Emergencies in Missouri</u> a status report on past and present hazardous waste spills and dump sites in Missouri stating that present state staff and funds are inadequate to provide emergency response and investigation in these incidents.
October 27, 1980 Governor's Letter 10-27-80 Appendix 2 Document #33	Governor informed Congressman Gene Taylor of clean-up activities in Southwest Missouri.
October 1980	Legislature amends Mo. Hazardous Waste Management Law.
November 1980	RCRA regulations issued on management and regulation of hazardous wastes.
December 1980	Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (Superfund Law) passed.
January 1981	Water and Waste Management School near Neosho sampled and certain areas secured and partially cleaned up by EPA.
January 1981	Hazardous Waste Management Task Force organized and holds first meeting.
April 20, 1981	EPA briefing for Dr. Donnell and Dr. Griffin on Missouri Division of Health held in Kansas City by Dr. Carl Zenz (M.D.) and Robert James.
April 28, 1981	Dr. Donnell had phone conference with Pat Honchar of NIOSH.
April 28, 1981 DOH Memo 4-28-81 Appendix 2 Document #33a	Donnell reported to Akhter (Director DOH) on EPA meeting on Neosho.
May 1981	Dr. Donnell met with Dan Harris (EPA) et al. in Neosho to brief Water and Waste Management School and public on health effects of dioxin.
June 9, 1981	EPA briefing on dioxin in Kansas City.
August 1981	EPA sampled new farm site in southwest Missouri.

September 1981 EPA begins consolidation of various leads and records.

September 1981  
HWMTF Report 9-30-81  
Appendix 2  
Document #34 Report of Hazardous Waste Management Task Force.

November 5, 1981 Donnell (DOH) received call from Dan Harris--  
new dioxin site south-west Missouri (farm).

November 30, 1981 Donnell (DOH) received call from Mary Murphy,  
Industrial Hygienist with OSHA, regarding  
complaint received from Neosho area citizen;  
referred to Pat Honchar (National Institute for  
Occupational Safety and Health - NIOSH).

March 1982 EPA obtains CDC records on 1974 investigation  
from DOH.

March 25, 1982  
FDA Chart 3-25-82  
Appendix 2  
Document #35 Department of Natural Resources/Missouri Division  
of Health advisory on limiting consumption of fish  
from Spring River in southwest Missouri. DNR/DOH  
conduct public information meetings on Spring  
River in Aurora.

April 1982 In conversation with EPA investigators, Ms. Piatt  
of Shenandoah Arena expressed concern about dust  
in rafters in arena and indicated that she believes  
horses are still dying. Eight 4-H horses were  
taken there three years ago, once per week for a  
show starting about 1979, and all horses got sick  
after 8-10 weeks. Four of them died. Horses  
foamed at the mouth and had same symptoms as  
horses which died earlier. Judy Piatt indicated  
to EPA investigators that Bliss lost 12 horses  
in 1970.

April 15, 1982 EPA briefing for state officials on dioxin in  
Spring River fish.

April 16, 1982 DNR memo briefing Dick King, Governor's office on  
Spring River fish data.

April 27, 1982 Department of Natural Resources press release on  
dioxin in Spring River fish; conference call with  
EPA, Missouri Division of Health and CDC on health  
effects.

May 12, 1982 Sampling plan for arenas and residences developed  
by EPA.

Early June 1982 Sampling of arenas and residences is completed  
by EPA.

June 1, 1982 DNR memo briefing Dick King, Governor's office, on investigations of horse arenas.

June 9, 1982 Franke request to Todhunter requesting action level on dioxin sites.

June 10, 1982 DNR memo briefing Dick King, Governor's office, on dioxin investigations.

July 13, 1982 Todhunter memo to Franke responding to request for action level; indicates all sites must be considered on case-by-case basis.

July 26--August 4, 1982 Results received on samples taken at arenas and residences.

August 13, 1982 Crunkilton (Mo. Dept. of Conservation) letter to Syntex regarding fish sampling and analysis in Spring River.

August 17, 1982 DNR memo to Alden Shields, Governor's office, on discovery of dioxin.

August 17, 1982 Memo from Donnell to Reichart on distribution of dioxin in Missouri.  
DOH Memo 8-17-82  
Appendix 2  
Document #35

August 18, 1982 EPA releases data on horse arenas and Jefferson County residences. DNR, DOH and EPA officials visit residents and inform them of results.  
DOH Memo 8-23-82  
Appendix 2  
Document #36

August 19, 1982 Missouri Division of Health Advisory on Health Effects of Dioxin issued; memo from Dr. Donnell to Joseph Reichart on Distribution of Dioxin in Missouri.

August 23, 1982 Memo from Fred Lafser (Director, DNR) to Alden Shields (Governor's Staff) regarding eastern Missouri dioxin sites.

August 23, 1982 EPA letters to stable owners requesting closure to protect public health.  
EPA Memo 8-23-82  
Appendix 2  
Document #37

September 7, 1982 Memo from Fred Lafser (Director, DNR) to Alden Shields (Governor's Staff) regarding meeting between DNR and EPA on eastern Missouri dioxin sites.

September 7, 1982 EPA, CDC and DOH conference call on Missouri dioxin sites.  
CDC Memo 9-7-82  
Appendix 2  
Document #38

September 13, 1982 EPA meeting with state officials with more data on dioxin in Spring River fish.

September 14, 1982 Bob Schreiber (Director, DEQ) sends memo to Fred Lafser (Director, DNR) updating him on dioxin investigation in Missouri.

October 4, 1982 Fred Lafser (Director DNR) sends memo to Alden Shields (Governor's Staff) regarding potential superfund sites in Missouri

October 12, 1982 EPA invited Missouri Division of Health and Mo. Dept. of Natural Resources to participate in public hearing at Meramac Heights Elementary School in Arnold, MO on October 14, 1982; Dr. Donnell called CDC for consultation.

October 14, 1982 Public meeting in Arnold, Missouri to brief area residents.

October 14 & 15, 1982 Public and press briefing on EPA plan to survey Minker and Stout sites; health effects explained by Dr. Donnell and Dr. Matt Zack.

October 18, 1982 Additional intensive sampling begun at and near Minker and Stout residences.

October 22, 1982 Crunkilton letter to Mr. Ritchey (EPA, Region VII) questioning validity of Spring River fish findings.

October 27, 1982 EDF release of EPA document listing additional sites where dioxin-contaminated wastes may have been sprayed.

October 27, 1982 UPI released preliminary list of possible additional dioxin sites.

October 28, 1982 Crunkilton sends a copy of October 22, 1982 letter to Dr. Phillips.

October 29, 1982 Department of Natural Resources press release on 14 plus "41" sites; Dr. Phillips prepares two page summary of dioxin for Dr. Hotchkiss.

October 30, 1982 EPA sends letters to people included on list.

November 1, 1982 Briefing for Dr. Robert Hotchkiss, newly appointed Director of Missouri Division of Health, on dioxin by Dr. Donnell and Dr. Phillips.

November 3, 1982 Briefing for Linda James, Department of Natural Resources, and sharing of Missouri Division of Health priority list by Dr. Donnell and Dr. Phillips.

November 3, 1982                    Sampling completed at Minker and Stout residences.

November 5, 1982                    Bill Hedeman, Art Spratlin brief Missouri Congressional delegation in D.C. concerning dioxin problems; Spratlin meets with Dingell committee staff.

November 5, 1982                    Lafser's letter to Shields recommending Governor Bond to act.

November 9, 1982                    Governor Bond's letter to EPA administration recommending four points of action.

November 10, 1982                    Art Spratlin (EPA) testifies at hearing held by Representatives Gephardt and Wyden, Missouri Lt. Governor Rothman, and 14 State senators and representatives to discuss efforts to address dioxin problem.

November 10, 1982                    Congressman Gephardt holds committee meeting at Hillsboro hearing testimony of Art Spratlin and Fred Lafser and a few citizens.

November 17, 1982                    EPA, Department of Natural Resources and Missouri Division of Health conference call providing latest findings on fish in Spring River; agree to continue advisory.

November 17, 1982                    Representative Bob Fiegenbaum (D), District 59, held public hearing in Arnold, MO to hear citizen comments, health and other problems, video tape made for Washington, D.C. hearing on November 19, 1982.

November 18, 1982                    Dr. Donnell invited to meet with Department of Natural Resources to develop strategy for state action on dioxin to be announced by Governor Bond on November 22 or 23; also contacted CDC, Paul Weisner, to solicit consultation on epidemiologic studies to be obtained.

November 19, 1982                    Congressional Hearing on dioxin.

November 22, 1982                    First Dioxin Task Force Meeting in Governor's office. Dr. Falk and Dr. Stehr of CDC arrive in Missouri.

November 22, 1982                    Phillips called Liddle at CDC Lab to obtain data on September 1976 samples at Minker/Stout sites which had been previously sent to CDC by DOH.

November 23, 1982                    Department of Natural Resources, EPA, CDC, and Missouri Division of Health all tour Minker and Stout areas, see Bubbling Springs and Times Beach from the road. News conference arranged by elected officials prior to tour.

November 24, 1982  
 Second Dioxin Task Force Meeting and news briefing in a.m. Department of Natural Resources, CDC and Missouri Division of Health meet with EPA in their Kansas City office in p.m. EPA refused to release lab findings.

November 28, 1982  
 Drs. Hotchkiss, Donnell and Phillips meet to discuss dioxin-related matters with Linda James (DNR) and Jim Long (DNR) in Columbia.

December 1, 1982  
 DOH Document  
 12-1-82  
 Appendix 2  
 Document #39  
 Monsanto and Mr. Feigenbaum invited biochemist, Dr. Robert Neal, to explain dioxin to Missouri officials in St. Louis. Dr. Neal meets public and media in evening. DOH briefing document on health effects of dioxin.

December 2, 1982  
 Dr. Donnell flies to CDC to see lab data and consult with CDC regarding health risk and health effects.

December 3, 1982  
 CDC refuses to release EPA lab data to Missouri Division of Health.

December 6, 1982  
 Third Dioxin Task Force Meeting.

December 6, 1982  
 DOH Memo 10-6-82  
 Appendix 2  
 Document #40  
 DOH memo to Governor Bond on possible health effects of dioxin.

December 7, 1982  
 Staff of DNR, DOH, Governor's office meet with EPA and CDC to receive data. Governor briefed that evening prior to meeting with Rita Lavelle.

December 7, 1982  
 Federal Position  
 Statement 10-7-82  
 Appendix 2  
 Document #41  
 Drs. Donnell and Mariano meet with EPA and CDC in St. Louis to see lab data and observe process of sharing data with Minker and Stout related families. Dr. Hotchkiss and Department of Natural Resources meet with CDC and EPA in Washington, D.C.

December 8, 1982  
 Simultaneous news release Washington, D.C. and St. Louis regarding Governor Bond's meeting with Rita Lavelle and release of lab data and EPA decision to proceed with "planned removal" option.

December 9, 1982  
 CDC consultant team visit with Division of Health.

December 9, 1982  
 EPA, DNR, FEMA, SEMA, DOH meet to draft relocation plan.

December 10, 1982  
 CDC consultant team conclude visit with Division of Health.

December 10, 1982  
DOH Memo 12-10-82  
Appendix 2  
Document #42

DOH memo on dioxin investigation.

December 10, 1982

DNR, SEMA and DOH draft relocation plan and telecopy to EPA and FEMA.

December 14, 1982

Letter from Rita Lavelle on relocation revised plan telecopied to EPA.

December 15, 1982

Memo from Fred Lafser (Director, DNR) to Alden Shields (Governor's Staff) indicating that FEMA has approved relocation plan.

December 15, 1982  
Relocation Plan  
12-15-82  
Appendix 2  
Document #44

FEMA transmits approval of relocation plan to Governor's office. Letter from Dave Wagoner, EPA saying relocation plan is acceptable

December 15, 1982  
DOH Statement  
12-15-82  
Appendix 2  
Document #43

Dr. Phillips reviews Division of Health files and prepares index for report. Division of Health received word of Envirodyne Lab findings of dioxin at Times Beach and prepared statement it shared with St. Louis County Health Department.

December 16, 1982

Drs. Donnell and Phillips working with Department of Natural Resources on Division of Health personnel summary dioxin report. Linda James and Dr. Donnell called six Minker site families about temporary relocation. EPA invitation issued to meet 20 December in Kansas City on Spring River data.

December 17, 1982  
Relocation Plan  
12-15-82  
Appendix 2  
Document #44

Linda James, Bill Barnthouse of SEMA and Dr. Donnell meet with Minker site families in a.m. Governor's office press release on relocation in p.m.

December 20, 1982

Dioxin Task Force Meeting in Shield's office. Dr. Phillips of Division of Health and Mr. Schreiber of Department of Natural Resources attend Spring River dioxin meeting in EPA office in Kansas City.

December 22, 1982

Dioxin Report delivered by Department of Natural Resources/Department of Social Services.