

Automobile Shredder Material

Gerdau-Lafarge/Systech Project
Fluff as Alternative Fuel for Cement Kilns
2004-2013

Presented by (Jack) John Skelley – Gerdau

Missouri Waste Control Coalition
PCB Workshop
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Chronology of Events

- **2004** OSWER/CALEPA-DTSC cooperative study commenced
- **2005** The current project started under the United States Business Council for Sustainable Development (USBCSD), Byproduct Synergy Program (BPS) set up during the President G.W. Bush Administration.
- **March 2006** - CALEPA-DTSC study was released. The study concluded that, when properly processed, auto fluff is technically suitable as cement kiln fuel. However, if contaminant issues could not be overcome, few alternatives were left but land filling.
- **July 2006** - Gerdau worked initially with Lafarge/Systech through the KCMO BPS Chapter. In July 2006, a legal impasse on the PCB presumption for auto fluff was reached between EPA R7, Gerdau and Lafarge/Systech. The resolution of this legal impasse was beyond the scope of the KCMO BPS Chapter. At that time, Gerdau chose to finance and pursue a legal remedy independently.
- **2006-2010** - Gerdau worked with Chet Thompson-Crowell-Moring, EPA R7, EPA HQ (OSWER, OPPT), and Lafarge/Systech on a legal remedy for addressing the TSCA, PCB issues with auto fluff.
- **January 20, 2010** – EPA R7 approved the procedures for commercially utilizing auto fluff as an alternative fuel in cement kilns.

Shredder Fluff-ASR description

Shredder Fluff-ASR (auto shredder residue):

- Fluff is comprised of all things non-metal from the shredding of autos, buses, trucks, boats, RV's, tractors, misc. equipment, appliances, toys, bicycles, demolition debris, off-spec products, and other ferrous metal scrap sources
 - Upholstery materials, seats, cushions, wire insulation, plastics, rubber, glass, foams, insulation, carpet, vinyl, composites, weather stripping, wood, shingles, electronic components, etc.
- Approximately 1 million tons of fluff are generated annually.
- Most fluff is disposed as daily cover in Subtitle D landfills
- Fluff typically has a high BTU/lb (4000-7500) when the metal, glass, and dirt components are separated.

Shredder Facts:

- Approximately 200 shredders operate in the USA
- Shredders recycle more than 145 million tons of scrap annually
- Ferrous scrap from shredders is termed as “frag”
- Non-ferrous is separated at most shredders and sold into the various recycling markets for copper, brass, aluminum, recovered coins, etc.

Shredder fluff pictures



Regulatory Status of Fluff

- PCBs are regulated under TSCA
 - Uses of PCBs regulated by USEPA OPPT
 - Disposal and remediation by USEPA ORCR
 - ORCR coordinates implementation of the program through EPA's 10 Regional PCB Coordinators
 - The PCB program is not delegated to the States
- Regions make determinations on site specific permits, cleanup plans, and petitions for regulatory variations
 - If a decision impacts more than one EPA Region, the decision-making is elevated to EPA HQ

Evaluation of Shredder Residue as Cement Manufacturing Feedstock

CALEPA-DTSC, March 2006

Conclusions from final paragraph of report, Page 19

- Barriers inhibiting viable recycling alternatives may need to be addressed.
- If PCB and other contaminant concerns cannot be overcome for use of SR, few if any other options exist other than land filling.
- Residual PCBs present a barrier for any recovery alternative but actually promote land filling over resource recovery, contrary to the principles of RCRA.
- The presence of mercury also lowers the value of SR derived fuel. Other contaminants may be of concern as well. Reducing the contamination of SR from components in the shredder feed stocks (e.g., PCB laden capacitors, lead wheel weights, and mercury switches) may be the most significant barrier to overcome.
- Full scale demonstration of separation and use is the next step.
- Some development of techniques to reduce the contaminant levels may be needed, followed by testing to show that no significant increases in emissions at kilns would occur.

EPA presumption on PCB's in Shredder Fluff

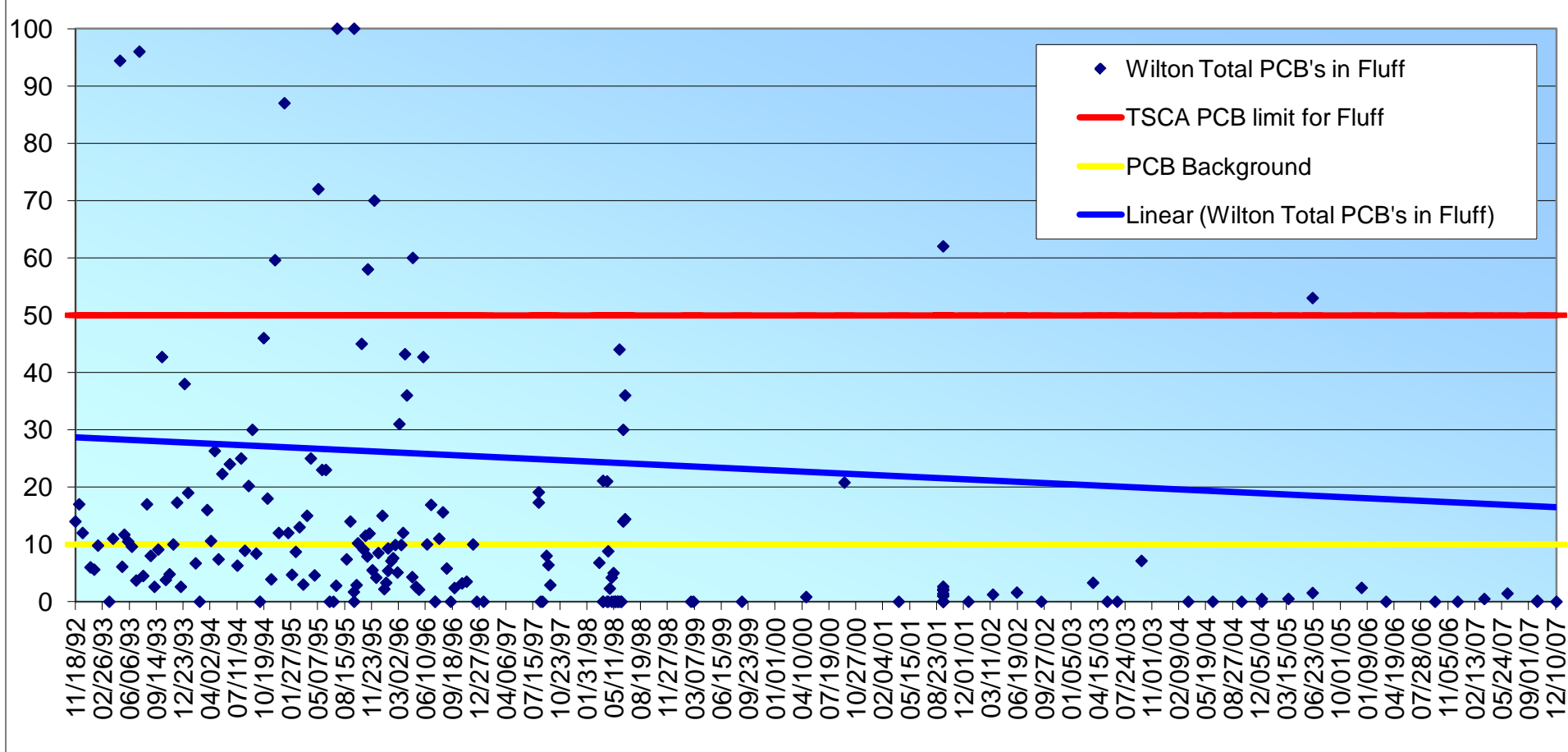
(based on the EPA's *PCB Question and Answer Manual*)

- Q. A scrap dealer shreds vehicles, etc., and produces shredder fluff. Grab samples show that PCBs are present in the fluff at concentrations <50 ppm. The source of the PCBs is not known. Is this waste a PCB bulk product?
- A. PCB bulk product waste is regulated for disposal if the concentration at the time of designation for disposal was ≥ 50 ppm PCBs. This means that if the shredder feedstock contained any material with a PCB concentration ≥ 50 ppm, the resulting fluff is regulated no matter what its concentration. *If you are unable to establish that the PCBs in the fluff came from a source other than a ≥ 50 ppm feedstock, your fluff is regulated as PCB bulk product waste..*

Gerdau/Crowell-Moring Effort to show EPA presumption on PCB's in Fluff is rebuttable

- Gerdau's position on the EPA presumption was not to prove where the PCB's came from, but where they did not come from
 - Chet Thompson-Crowell Moring worked with EPA HQ, Matt Hale & David Hockey-OSW as well as representatives from OPPT on behalf of Gerdau.
 - The PCB disposal program was transferred from the TSCA Office to the Office of Solid Waste (OSW) on Oct. 1, 2007.
- Gerdau Wilton, IA had PCB data, showing that a with source control program that removed PCB articles from scrap to the best extent practical, that PCB's still present in fluff were NOT from PCB articles
 - Gerdau Wilton's data illustrated that source control over many years (1992-2008), resulted in declining PCB levels in fluff.
 - The source control program followed by the Gerdau Wilton facility is per the Discarded Appliance Demanufacturing Rule, Iowa Administrative Code Section 567-118.
- On November 24, 2008, Mr. Thompson-Crowell-Moring received a letter from Matt Hale – USEPA OSW stating the stipulations under which the EPA's PCB's in Fluff Presumption is rebuttable and that *“Region 7 will evaluate Gerdau's scrap sources and scrap management protocol and provide approval if it is sufficient to rebut the presumption with regard to feedstock source concentrations. Thus, Gerdau should work with EPA Region 7 on this matter. We certainly will confer with Region 7, however, as it reviews this matter”*

Gerdau Wilton Fluff - PCB Data mg/kg



Gerda Protocol for ASR as Alternative Fuel – Draft & Review Process

- Gerda worked with EPA R7 on specific protocols that addressed three (3) major areas:
 1. Source control program
 - Controls on feedstock (e.g., no hazardous materials, no capacitors, adherence to gas tank removal program, fluff screening)
 - Agreements with suppliers (e.g., appliances only from IDNR registered demanufacturers, inspections, audits)
 2. Sampling program
 - Specific analyses and frequency of samples
 - Analytic methods
 3. Alternative fuel requirements
 - Allowance from IDNR to use as alternative fuel in kiln
 - Agreements with IDNR on air permits

Gerda Protocol for ASR as Alternative Fuel – Draft & Review Process

- Protocol drafts were reviewed by:
 - EPA Regional PCB Coordinators Regions 1-10
 - EPA Region 7 Staff (Air, RCRA, TSCA Branches)
 - IDNR Air and Solid Waste Divisions
- Final protocol documents were approved by Rebecca Weber – EPA Region 7, Jan. 20, 2010

Technical issues with Processing and Certifying Fluff for Alternative Fuel

- Extreme heterogeneity of fluff matrix made obtaining consistent analytical results very difficult
 - SOLUTION
 - Keith Earhart – PDC Laboratories, St. Louis, MO developed a cryogenic preparation technique that processed the fluff samples into a more manageable form and helped immensely in getting more reproducible and reliable analyses.
- Material processing
 - removing as much metal and non-combustible material as practical
- Material handling/storage
 - Keeping the material dry while waiting for confirmatory analyses to be completed
 - Keeping other contaminants (slag, dirt, rocks, etc.) out of fluff once processed, and before transporting to alternative fuels unit.

Test parameters for each fuels batch

- PCB's (total PCB in mg/kg), all TSCA PCB's
- Lead – Pb; Total (mg/kg) and TCLP (mg/L)
- Mercury –Hg; Total (mg/kg) and TCLP (mg/L)
- RCRA Metals; TCLP (mg/L)
- Chlorine (% dry and wet wt.)
- BTU/lb
- Sulfur % composition
- Nitrogen % composition
- Halogens as Cl
- Fluorine %
- Viscosity cps
- Density g/mL
- % Ash
- % Water
- % Volatile
- % Fixed Carbon

Total Metals (mg/kg)

- Sb
- As
- Ba
- Be
- Cd
- Co
- Cr
- Cu
- Hg
- K
- Mn
- Na
- Ni
- Se
- Ag
- Tl
- Zn

2013 Trial Status

- 1st batch (March 20, 2013)
 - Some stainless steel, rock, and small metal present in processed fluff. This needs to be reduced.
 - no adverse affects on the kiln pyro process, quality, or emissions.
- 2nd- 4th batches, TBD later in 2013
 - Gerdau will installing further separation equipment later in 2013
 - Working on delivery logistics using walking bed trailers

Systech System at Lafarge Davenport



Photos from Oct. 2006



Participants

(Many people were involved from 2004 to 2013. Those with records of participation are listed here)

U.S. EPA Region 7

Patrick Bustos - Chief, CRIB
Mazzie Talley - PCB Coordinator
Lachala Kemp – Chem. Engr., PCB Prog.
Ken Herstowski - RCRA Program
Kent Johnson - Counsel
Robert Webber - Clean Air Program
Rebecca Weber - Dir., AWMD
Lynn Slugantz
Donald Toensing

U.S. EPA HQ

Matt Hale - OSW
David Hockey - OSW
Molly Finn - OSW
Andrea Medici – OPPT
John H. Smith – OPPT
Tony Baney
Phyllis Flaherty
Marna McDermott
Lynn Vendinello
Amy Hensley

Iowa Dept of Natural Resources

Brian Tormey – Chief, LQB, ESD
Susan Johnson – Env. Scientist, LQB
Chris Rolings – Env. Engr. Sr, AQB
Cory Deter – Env. Engr., AQB

U.S. EPA PCB Coordinators

Kimberly Tisa - Region 1
James Haklar – Region 2
Daniel Kraft - Region 2
Alizabeth Olhasso - Region 3
Ken Feely - Region 4
Raj Aiyar - Region 4
Patricia Anderson - Region 4
Anton Martig - Region 5
James Sales - Region 6
Lou Roberts - Region 6
Kim Le - ENF Region 8
Dan Bench - Region 8
Annastacia Braye - Region 9
Daniel Duncan - Region 10

State Regulatory Agencies

Pinky Feria – ECY, State of Washington

Crowell Moring

Chet M. Thompson
David P. Ross
Duane Siler

Peoria Disposal Company

Keith Earhart – PDC Laboratories
Darrell L. Woolery – PDC Area
Roxann Shull – PDC Laboratories

KCMO BPS Chapter (BTG)

Otavio Silva
James Frazier

Lafarge North America Inc.

Kurt Gerdes, Director Raw Materials
Bonita Bogaert – Env. Mgr. Davenport, IA
Joe Pennings – Plant Mgr. Davenport, IA
Jerry Miller - Davenport, IA
Thomas Moore - Counsel

Systech, a Subsidiary of Lafarge

Rhonda McGhee - Non-Haz Sales Director
Greg Hendrick - Regional Sales Manager
Kelly Behrens - Customer Service Rep

Gerdau

John Mogle – Wilton, IA
Becky Thumma – Wilton, IA
Jennifer Van Hall – Wilton, IA
Bryan Foit – Wilton, IA
Mark Vanderveer – Wilton, IA
Kevin Brisker – Wilton, IA
Chris Ervin – Wilton, IA
Gabriel Farias – Wilton, IA
Carl Czarnik – Wilton, IA
Jim Turner – Tampa, FL
Luis Nieves – Tampa, FL
Dale Harman – Midlothian, TX
Douglas Stolowski – St. Paul, MN
Rob Farrell – St. Paul, MN
Sean Mullan – St. Paul, MN
Jim Wold – Jacksonville, FL

SUMMARY

- The legal/regulatory path and protocols established during this project were done without any new rulemakings, rule modifications, or litigation.
 - Only a “presumption” had to be addressed
- This project provides a great example of commercial/regulatory cooperation to achieve a common sense objective.

[EPA–HQ–OPPT–2012–0902; FRL–9371–9] Polychlorinated Biphenyls (PCBs) Recycling Plastics From Shredder Residue

Pg. 74006, Federal Register / Vol. 77, No. 239 / Wednesday, December 12, 2012 / Notices

- 2011 – Gerdau rejected Harley/GM outlet for plastics from fluff (to be recycled into upholstery and misc. parts) due to TSCA 2 ppm in commerce rule.
- EPA proposes a new <50 ppm in commerce for plastics recycled from fluff exclusion in the Dec. 12, 2012 notice.
- Gerdau supports Plastics Recycling and urges EPA to make the same <50 ppm reconsideration extend to alternative fuel as well.
 - Gerdau comments at:
 - Comment # EPA-HQ-OPPT-2012-0902-0021
- Pg. 20640, Federal Register / Vol. 78, No. 66 / Friday, April 5, 2013 / Notices
 - EPA approved <50ppm in commerce for plastics in fluff exclusion.
 - Plastics often contain chlorine, which is a problem for cement kilns
 - Having a home for plastics from fluff may enhance the option(s) for alternative fuel

Questions - ??

- Gerdau contact

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