October 8, 2009

Q&As:
Perfluorochemical (PFC) Contamination in Dalton, GA
Prepared by U.S. Environmental Protection Agency (EPA)

A. DALTON-SPECIFIC Q&As

Further questions about information contained within this section of the document should be directed to EPA Region 4, Carl Terry – 404-562-8325

1. When did EPA learn about the release of PFCs at the Loopers Bend Wastewater Treatment Plant in Dalton, Georgia?

EPA learned of the presence of PFCs at Dalton Utilities' Loopers Bend Wastewater Treatment Plant site in July 2009. This information was reported to EPA by Dalton Utilities.

2. Why and how long has EPA been investigating the PFC issue in Dalton, Georgia?

EPA became aware of concentrations of PFCs in the Conasauga River as a result of research conducted in 2006 (published in 2008) by EPA's Office of Research and Development in cooperation with the University of Georgia (UGA). (See answer to #3 below.)

In January 2009, EPA established Provisional Health Advisory (PHA) levels for two PFCs, perfluorooctanaoic acid (PFOA) and perfluorooctyl sulfonate (PFOS). The PHA for PFOA is 0.4 parts per billion (ppb) [micrograms per liter (ug/L)] and for PFOS is 0.2 ppb. In March of 2009, EPA Region 4 began investigating PFCs in the Dalton area by collecting and analyzing samples from four public water supply systems in the area. (See answer to #4 below.) None of the samples from these systems exceeded the PHA levels for PFOA or PFOS.

In May 2009, EPA asked Dalton Utilities to investigate the potential for PFC contamination of its land application sprayfield and the compost generated by the facility. EPA was aware that PFCs are widely used in carpet manufacturing, and that many carpet manufacturers discharge wastewater to the Dalton Utilities wastewater treatment plant.

In June 2009, in response to EPA's request, Dalton Utilities collected and analyzed samples from its sprayfield site including soil, ground water monitoring wells, and

effluent. It also sampled sewage sludge and compost produced in the wastewater treatment process, and surface water samples from the Conasauga River and a tributary, Holly Creek.

3. What other information is available on PFC releases in the Dalton, Georgia area?

As part of a graduate study in 2006 (published in 2008), UGA sampled the surface water from the Conasauga River for PFCs both upstream and downstream of Dalton Utilities. The report, published in 2008, indicated downstream samples had elevated concentrations of PFOA and PFOS. Concentrations of PFOA ranged from 0.24 to 1.15 ppb; concentrations of PFOS ranged from 0.19 to 0.32 ppb.

In response to the elevated PFOA and PFOS levels found in the published 2008 UGA study, UGA partnered with the Georgia Environmental Protection Division (GA EPD) in late 2008 to sample fish and mussel tissue from sites upstream and downstream of Dalton Utilities. Preliminary results from this sampling study indicate elevated levels of PFOS in spotted bass and blue catfish downstream of Dalton Utilities land application site. GA EPD is currently reviewing the fish tissues samples to determine if any follow-up actions are warranted.

4. Did EPA collect samples in Dalton, Georgia?

In March 2009, EPA collected and analyzed samples from three public water supply systems located downstream of Dalton, including those for Rome, Calhoun and Shannon due to their proximity to the Dalton Utilities wastewater treatment plant. EPA also sampled the Dalton public water supply system.

EPA has established drinking water PHAs for two PFCs: PFOA and PFOS. The PHA for PFOA is 0.4 parts per billion (ppb) [micrograms per liter (ug/L)] and for PFOS is 0.2 ppb. Concentrations of PFOA and PFOS in the samples collected from the four public water supply systems indicate no exceedances of the PFOA or PFOS PHA values.

5. What are the levels of PFCs found at the Loopers Bend Wastewater Treatment plant?

Samples collected by Dalton Utilities and reported to EPA in July 2009 indicate analytical results in the following ranges:

- The compost has PFOA values ranging from 1900 to 4500 ppb and PFOS values ranging from 210 to 2500 ppb.
- The one sample of fresh sewage sludge has a concentration of PFOA of 91 ppb and PFOS of 210 ppb.

- The wastewater application sprayfield monitoring wells have PFOA values ranging from no-detectable level up to 4.4 ppb and PFOS values ranging from no detectable level up to 5.2 ppb. These wells are not sources of residential drinking water.
- The soil from the wastewater application sprayfield has PFOA values ranging from 5.3 ppb up to 37 ppb and PFOS values from 37.7 ppb up to 288 ppb.
- The effluent from the sprayheads have PFOA values ranging from 0.5 ppb up to 0.8 ppb and PFOS values from no detectable levels up to 0.4 ppb.
- The surface water samples taken in the Conasauga River and Holly Creek had PFOA values ranging from no detectable level up to 0.4 ppb and PFOS values ranging from no detectable level up to 0.7 ppb.

6. What are EPA's action levels for PFCs found at the Loopers Bend Wastewater Treatment plant?

EPA has not established action levels for PFCs, including PFOA or PFOS, in soil, wastewater effluent, sewage sludge, compost or surface water.

The only "action level," or PHAs, were established by EPA in January 2009. The PHA for PFOA is 0.4 ppb and for PFOS is 0.2 ppb.

Carpet manufacturers have reported to Dalton Utilities and GA-EPD that the industry in Dalton has ceased using PFOA and PFOS in their manufacturing process. As such, manufacturers should not be discharging these chemicals to the Loopers Bend facility. Dalton Utilities with the cooperation of GA EPD is conducting a sampling investigation to determine the current loads of PFCs from the manufacturers to Dalton Utilities.

7. What are the sources of the PFCs found in effluent and compost from the Loopers Bend Wastewater Treatment Plant?

EPA believes that industrial discharges to the Dalton Utilities wastewater treatment plant, primarily from carpet manufacturers, have led to PFC concentrations in wastewater effluent, sewage sludge, composted sewage sludge, sprayfield soils, groundwater, and water samples from the Conasauga River and Holly Creek.

Dalton is known as "The Carpet Capital of the World" and is home to many carpet and flooring manufacturers who may use PFCs, such as PFOA and PFOS, as surface protection and stain guards in their products. (Approximately 90% of the world's carpet is produced in this area.) The majority of the wastewater treated by the Loopers Bend facility is from industrial sources, primarily carpet manufacturers.

PFCs are used in the production of a wide array of consumer products as a processing aid to create non-stick and stain-resistant surfaces and to impart water, stain, and grease resistance to carpets, paper and textile. Therefore, general domestic wastewater is expected to also contribute PFCs to the wastewater treatment plant. The concentration of

the PFCs in domestic wastewater is expected to be much less than the concentrations in wastewater from industrial carpet manufacturing.

8. How much wastewater is processed at the Loopers Bend Plant and what is the disposal method for the wastewater and sewage sludge?

After treatment, the 30 million gallons per day (mgd) of wastewater is land applied to a 9800-acre tract of land owned by Dalton Utilities using approximately 19,000 sprayheads. The sewage sludge or solids, also known as biosolids, are mixed with wood chips, composted on-site, and sold in bulk as soil amendment to businesses and individuals in northwest Georgia and southeastern Tennessee.

9. Is Dalton Utilities continuing its distribution of the compost to the general public?

No. Dalton Utilities has voluntarily stopped distributing the compost generated from its Loopers Bend wastewater treatment facility. Dalton Utilities continues to mix its sewage sludge with wood chips to produce compost. The composted material is currently being held on-site at the facility while Dalton Utilities, working cooperatively with GA-EPD and EPA, decides the future disposition of the compost.

10. Why are EPA / GA EPD allowing Dalton Utilities to continue spraying the effluent on the Loopers Bend land application area?

Based on the available information, the effluent spray irrigation system is in compliance with its GA EPD issued land application permit.

11. What is EPA doing about the levels of PFCs in Dalton, Georgia?

EPA continues to work with the GA EPD, the GA Department of Natural Resources (DNR), and Dalton Utilities to evaluate and respond to potential public health risks associated with PFCs from the Loopers Bend wastewater treatment facility.

Dalton Utilities has committed to providing alternative water to any private individuals with drinking water wells in the vicinity of the site found to have concentrations above the PHA levels. Dalton Utilities has agreed to conduct the following:

- A drinking water well survey to identify drinking water wells in the immediate vicinity of the land application system and to sample any identified wells for PFCs.
- An assessment of its wastewater collection system to identify any remaining sources and concentrations of PFCs in cooperation with the GA DNR.
- Plans to conduct a wildlife impact study of deer and turkey (including blood and tissue analyses) to determine potential impacts of PFOA and PFOS on the local wildlife population.

EPA is currently working closely with Dalton Utilities to assess information about locations where their compost was used. Dalton Utilities has indicated it will sample some locations to determine if PFC concentrations are detected in the soils or in private water wells in the vicinity of the applied compost.

EPA will keep the public informed of what we are finding and any actions taken to limit human and environmental exposures.

12. What can residents in the area who rely on private wells for drinking water do to protect themselves from exposure?

Most of the area around the Loopers Bend WWTP has access to public water, so nearby residents are not expected to obtain drinking water from private wells. Dalton Utilities conducted a survey to identify drinking water wells in the immediate vicinity of the land application system in order to sample the wells for PFCs. To date, Dalton has sampled all 110 private water wells in a 1-mile radius around the Loopers Bend facility and most have no detectable levels of PFCs. One private well was determined to have concentrations of PFOS slightly above EPA's PHA. Dalton Utilities has voluntarily provided this residence with bottled water, and will continue to provide bottled water until a permanent alternative source of drinking water is found. Dalton Utilities is continuing its private drinking water well survey and sampling effort, and will notify residents of the results of the sampling.

If residents are concerned about the water supply from their drinking water well, they may want to consider using an alternate source of drinking water (such as bottled water). Some water filtration devices (point-of-use devices that are installed at an individual tap, faucet, or outlets) may remove some PFCs from water, according to a study conducted by the Minnesota Department of Health. Individuals should contact the company that makes the water filtration devices to determine whether these devices are effective in removing PFCs and ask for advice on how often to change their filters.

13. Do residents in the area who rely on community water systems for drinking water need to take further precautions?

No. In late March 2009, EPA collected and analyzed the drinking water from the public water systems for Rome, Dalton, Calhoun and Shannon, Georgia due to their proximity to the Dalton Utilities wastewater treatment plant.

EPA has established drinking water Provisional Health Advisories (PHA) for two of the PFCs: PFOA and PFOS. The Provisional Health Advisory levels are 0.4 parts per billion (ppb) for PFOA and 0.2 ppb for PFOS.

Concentrations of PFOA and PFOS in the samples collected from the four drinking water systems indicate no exceedances of the PFOA or PFOS PHA values. Based on these data, EPA believes the public drinking water levels are not of concern and residents may rely on the public water from these systems

14. Will EPA continue to test the public water supplies?

EPA does not plan additional sampling of the public water systems since the recent sampling in the four drinking water systems (Dalton, Calhoun, Shannon, and Rome, Georgia) indicate no exceedances of the PFOA and PFOS PHA values. The officials at these public water systems were notified of their PFOA and PFOS sampling results and encouraged to monitor periodically for these chemicals. If new information becomes available which indicates potential PFC contamination in the public water systems, then EPA will consider additional sampling of those systems.

15. Should I be concerned about the potential for exposure to PFCs?

PFCs are widespread in the environment, and almost everyone has concentrations of PFCs in their bodies. Because PFCs are found in many different consumer products, such as carpet, textiles, rain-resistant clothing, and some food packaging, people may be exposed through many different pathways, including the water we drink and the air we breathe. The specific modes of exposure are not currently well understood. (See answer to 3B below.) The average concentrations of PFOA in the blood of U.S. residents is 4 nanograms per milliliter (ng/mL); the average concentration of PFOS is 30 ng/mL.

Concern about this class of chemicals has been growing recently because PFCs are very persistent in the environment; bioaccumlate in the human body; and remain in the body for many years (~ 10 years).

Information on the effects of PFCs in the human body are not yet well understood, although health studies are currently underway and more will be known in the next couple of years. Studies to date indicate that workers in facilities that manufacture PFCs are not at greater risk for significant adverse health effects. A few studies of pregnant women found higher levels in maternal blood to be associated with slightly lower weight of the babies. One study found a probable link between higher blood PFOA levels and an increased risk for high cholesterol and uric acid levels. (Uric acid is associated with hypertension.)

Laboratory studies on animals (mice and monkeys) indicate PFOA can cause developmental and other adverse effects in laboratory animals. In addition, laboratory studies have raised concerns about the potential for developmental, reproductive, and systemic toxicity of PFOS. PFOS is highly persistent in the environment and has a strong tendency to bioaccumulate.

In general, CDC recommends that exposure to PFCs be limited to the extent feasible.

Health-related information on PFCs may be found at the following US Agency for Toxic Substances and Disease Registry website: http://www.atsdr.cdc.gov/tfacts200.html

16. Is the compost safe to use?

EPA expects to develop an interim limit soon for PFOA and PFOS in soil that would protect individuals from the accidental ingestion of soil containing these compounds, such as a child playing in the soil. We call this a direct soil contact limit. The concentrations seen to date in the Dalton compost do not exceed the anticipated direct soil contact limits.

EPA has not established advisory levels for PFCs, including PFOA or PFOS, in compost. The Agency is currently in the process of evaluating available data to develop limits for PFCs in biosolids (sewage sludge). PFCs have complicated physical and chemical properties which make determination of appropriate and scientifically-defensible limits difficult. A PFC limit for biosolids is not expected in the near future. EPA will keep the public informed as progress is made towards determining limits to protect human health and the environment.

EPA and Dalton Utilities are currently investigating the potential for PFCs in the compost to migrate into underlying ground water and result in drinking water well contamination. We will keep the public informed as more information on this topic becomes available.

Health-related information on PFCs may be found at the following US Agency for Toxic Substances and Disease Registry website: http://www.atsdr.cdc.gov/tfacts200.html

17. Are my home grown vegetables safe to eat? I have eaten vegetables grown in compost from Dalton Utilities. What should I do?

Currently, there is insufficient scientific information to know if vegetables grown in soil amended with Loopers Bend compost have levels of PFCs and whether these concentrations pose any risk to human health. There is limited information indicating that plants may uptake some PFCs; however, the risk this poses to human health is unknown. EPA is considering future scientific research in this area.

If a person has concerns about the health effects associated with the compost and its uses, he or she may want to consider limiting contact with the compost and reduce or eliminate the eating of vegetables grown in the compost-amended soil. If a person has concerns about exposure to PFCs through vegetables grown in compost, he or she may want to consider speaking with their personal physician.

Additional health related information may be found at the following US Agency for Toxic Substances and Disease Registry website: http://www.atsdr.cdc.gov/tfacts200.html

18. Who purchased the Dalton Utilities' compost and where was it applied?

Many business and private individuals purchased the compost between the years of 2003 and 2009. Dalton Utilities has estimated that 80 million pounds of the compost were distributed during this time period. For approximately one year (2003), Dalton Utilities, through a contractor, Harvest Farms, packaged the compost in bags and sold to local garden shops. After 2003, Harvest Farms ceased bagging the compost and sold large volumes of compost in bulk to other companies. These companies resold the compost for a variety of uses in north Georgia and southern Tennessee such as landscaping and horticultural nurseries. Many private individuals also purchased compost directly from Dalton Utilities (through Harvest Farms) for use as landscaping and home garden soil amendment material.

19. Are my cattle / poultry / crops / feed safe since I used compost from Dalton Utilities on my farm?

FDA and USDA are best able to answer these questions and can be contacted by e-mail or telephone as follows:

Brian Mabry, USDA – Questions about Food Safety (meat, poultry and certain egg products (not shell eggs))
Brian.Mabry@fsis.usda.gov Phone: (202) 720-9113

Cindy N. Ragin, USDA - Questions about Animal and Plant Health
Cindy.N.Ragin@aphis.usda.gov, Phone: (301) 734-7280.

Mike Herndon, FDA – Questions about Food (all food except meat, poultry and certain egg products (FDA is responsible for shell eggs))
Michael.Herndon@fda.hhs.gov, Phone: (301) 827-9182

Siobhan DeLancey, FDA – Questions about Feed
Siobhan.Delancey@fda.hhs.gov, Phone: (301) 872-0857

The multiple components of feed potentially exposed to the compost and the subsequent dilution of these products would likely contribute to reducing the potential risk associated with the feed and products derived from animals consuming the feed. However, USDA and FDA at the present time do not have enough information to make a definitive determination associated with these potential risks.

20. How do I know if my compost came from Dalton Utilities?

EPA recommends that recipients of compost contact their distributor. The distributor should be able to identify the source of the compost.

21. What should I do if I received compost from Dalton Utilities?

EPA has not established advisory levels for PFCs, including PFOA or PFOS, in compost. However, the Agency is currently evaluating available data to develop these values and will keep the public informed of what we are finding and our actions taken to limit human and environmental exposures.

In the interim, if a person has concerns about the compost and its uses, he or she may want to consider limiting: contact with the compost; eating vegetables grown in the compost; and, other activities associated with its use.

22. Is the wildlife from the Loopers Bend facility safe to eat?

There is not enough scientific information at the present time to know if wildlife from the Loopers Bend facility is safe to eat. Dalton Utilities is planning to conduct a wildlife impact study of deer and turkey (including blood and tissue analyses) to determine potential impacts of PFOA and PFOS on the local wildlife population.

EPA will keep the public informed of what is found once the study is complete.

In the interim, if a person has concerns about exposure to PFCs through the food supply, he or she may want to consider limiting the consumption of game taken from the Loopers Bend facility.

Additional health related information may be found at the following US Agency for Toxic Substances and Disease Registry website: http://www.atsdr.cdc.gov/tfacts200.html

23. Is it safe to swim in the Conasauga River?

Currently, there is insufficient scientific information to know if PFCs in the Conasauga River present a threat to human health through exposures during swimming. EPA expects to have a limit soon for the protection of human health from direct contact to PFOA and PFOS, during recreational activities, such as swimming. (This is the same value discussed in #17 above.) EPA will inform the public as soon as the direct contact limit is available.

In the interim, if a person has concerns about exposure to PFCs in surface water, he or she may want to consider limiting contact with the Conasauga River.

Additional health related information may be found at the following US Agency for Toxic Substances and Disease Registry website: http://www.atsdr.cdc.gov/tfacts200.html

B. PFC BACKGROUND

Further questions about information contained within this section of the document should be directed to EPA's Office of Public Affairs – Dale Kemery (202-564-7839) or Enesta Jones, (202-564-7873).

1. What are PFCs?

PFCs are synthetic (man-made) chemicals that do not occur naturally in the environment. These compounds are used in a variety of industrial and consumer applications, including use as a processing aid in the manufacture of non-stick and stain-resistant surfaces and products and to impart water, stain, and grease resistance to carpets, paper and textile. Two of the PFCs, PFOA and PFOS, are very persistent in the environment and have been found at very low levels both in the environment and in the blood of the general U.S. population. PFOS is no longer manufactured in the U.S. Some PFCs have been determined to be degradable in the environment and to form PFOA, PFOS and related compounds.

2. How long has the Agency been looking into PFCs and their potential risks?

In the late 1990s, EPA received information from industry under TSCA Section 8(e) indicating that PFOS was widespread in the blood of the general population, and presented concerns for persistence, bioaccumulation, and toxicity. Following discussions between EPA and 3M, the manufacturer of PFOS, the company terminated production of these chemicals. Findings on PFOS led EPA to review similar chemicals, including PFOA, to determine whether they might present concerns similar to those associated with PFOS.

3. How are people exposed to PFOA?

EPA does not have a full understanding of how people are exposed to PFOA, which is used as a processing aid in the manufacture of fluoropolymers, and may also be a breakdown product of other related chemicals, such as some fluorinated telomers. In April 2003, EPA released a preliminary risk assessment for PFOA and started a public process to identify and generate additional information to better understand the sources of PFOA and the pathways of human exposure. This new information, which is still under development, will assist the Agency in determining if there are potential risks and what risk management steps may be appropriate.

Specifically, EPA is working with industry and other stakeholders to obtain additional environmental monitoring information on PFOA, exposures resulting from incineration or loss from products as they are used over time, and telomer biodegradation as a potential source of PFOA. The Agency has finalized TSCA Section 4 Enforceable Consent Agreements (ECAs) and Memoranda of Understanding (MOUs) for exposure-related studies with industry in a public process involving a large number of interested parties, and is cooperating with industry and other stakeholders on additional voluntary research activities. In addition, EPA's Office of Research and Development has collaborated with OPPT and is conducting research focused on the health effects and exposures to PFOA and other perfluorinated chemicals. This research is designed to generate enhanced science knowledge and high quality data that will help the Agency address these key uncertainties in pathways of exposure and potential risks from PFOA.

4. What steps has the Agency taken to reduce exposure to PFCs?

In January 2006, EPA invited the eight major companies in the industry to participate in the 2010/2015 PFOA Stewardship Program. The companies agreed to participate and in so doing committed to reduce facility emissions and product content of PFOA and related chemicals by 95% by 2010, and to work toward eliminating emissions and product content by 2015. Commitment to the program is in addition to and does not replace existing commitments to enforceable consent agreements or memoranda of understanding. The first progress reports were received in October 2007, and showed significant reductions. For example, three companies reported greater than 98% reductions in emissions of PFOA in the United States, and five companies reported greater than 74% reductions of PFOA outside the United States.

There has also been considerable progress in the development and introduction of substitutes and alternates. For example, in early 2006, Asahi introduced a new line of products that were free of PFOA and PFOA precursors. In 2007, DuPont committed to "eliminate the need to make, buy or use PFOA by 2015." In late 2007, Daikin announced intentions to "stop manufacturing, using and selling PFOA and C8 telomer-based water and oil repellent products by the end of 2012." In early 2008, 3M announced intentions to introduce a PFOA substitute this year to be used in the manufacture of some of the products currently on the market. To date, companies have submitted more than 50 new chemical alternatives to EPA for review through the Premanufacture Notification (PMN) process. More information on the 2010/15 PFOA Stewardship Program is available at http://www.epa.gov/oppt/pfoa/pubs/pfoastewardship.htm.

Although more time will be needed to assess the full impact of steps taken to date, a possible indication of progress can be found in a U.S. Centers for Disease Control and Prevention (CDC) study, published in 2007, which reported significant reductions in human blood concentrations of PFOS and PFOA from 1999-2000 compared to the most recent data in 2003-2004. The geometric mean for PFOA in human blood was reduced by 25% over this period and PFOS was reduced by 32%. The report concluded that these reductions were most likely related to changes brought about by EPA efforts on these chemicals and other related efforts by government and industry.

5. What recommendations does the Agency have for consumers who use products made with these PFCs?

Consumer products made with PFCs include some non-stick cookware and products such as breathable, all-weather clothing. PFCs are also employed in hundreds of other uses in almost all industry segments, including the aerospace, automotive, building/construction, chemical processing, electrical and electronics, semiconductor, and textile industries. Telomers are used as surfactants and as surface treatment chemicals in many products, including fire fighting foams; personal care and cleaning products; and oil, stain, grease, and water repellent coatings on carpet, textiles, leather, and paper. These products are not PFOA, however. PFOA is used as a processing aid. The information that EPA has available does not indicate that the routine use of household products poses a concern. EPA does not have any indication that the public is being exposed to PFOA through the use of Teflon®-coated or other trademarked nonstick cookware. Teflon® and other trademarked products are not PFOA. At the present time, EPA does not believe there is any reason for consumers to stop using any products because of concerns about PFOA.

6. What are the concerns related to PFCs (PFOA/PFOS)?

PFOA is very persistent in the environment and has been found at very low levels both in the environment and in the blood of the general U.S. population. Exposure can occur from ingesting contaminated food or drinking water or breathing contaminated air. Treated carpets could be an important source of exposure for children. Workers exposed to PFCs have not shown significant adverse health effects. Little research has been done on the general population to determine whether these chemicals may cause adverse health effects. A few studies of pregnant women found higher levels in maternal blood to be associated with slightly lower weight of the babies. Studies indicated that PFOA can cause developmental and other adverse effects in laboratory animals. PFOA also appears to remain in the human body for a long time. All of these factors, taken together, prompted the Agency to investigate whether PFOA might pose a risk to human health and the environment at the levels currently being found, or at levels that might be reached in the future as PFOA continues to be released into the environment.

Studies have raised concerns about the potential developmental, reproductive, and systemic toxicity of PFOS. PFOS is highly persistent in the environment and has a strong tendency to bioaccumulate.

Additional health related information may be found at the following US Agency for Toxic Substances and Disease Registry website: http://www.atsdr.cdc.gov/tfacts200.html

7. Is there a risk assessment on PFOA?

To ensure that the most rigorous science is used in the Agency's ongoing evaluation of PFOA, the EPA Office of Pollution Prevention and Toxics submitted in 2005 a draft risk assessment for formal peer review by the Agency's Science Advisory Board (SAB). That

draft was preliminary and did not provide conclusions regarding potential levels of concern. The SAB reviewed the information that was available at the time, and suggested that the PFOA cancer data are consistent with the EPA guidelines descriptor "likely to be carcinogenic to humans." Since their review, additional research has been conducted pertaining to the carcinogenicity of PFOA. EPA is still in the process of evaluating this information, and has not made any definitive conclusions at this time.

8. What is the status of the Agency's efforts regarding reducing exposure to PFCs?

Following the voluntary phase out of PFOS and closely related chemicals by the principal worldwide manufacturer, EPA took prompt regulatory action through issuance of significant new use rules (SNURS) under the Toxic Substances Control Act (TSCA) to limit any future manufacture or importation of 88 PFAS (perfluoroalkyl sulfonate) chemicals specifically included in that phaseout. EPA uses the generic term perfluoroalkyl sulfonates (PFAS) to encompass more generally the category of perfluorinated compounds, which includes those with eight carbons (C8) as well as those with higher and lower amounts of carbon. The Agency uses the term PFOS to represent only those chemical substances that are predominantly C8.

These SNURs allowed the continuation of a few specifically limited, highly technical uses of these chemicals for which no alternatives were available, and which were characterized by very low volume, low exposure, and low releases. Any other uses of these chemicals would require prior notice to and review by the Agency. Subsequently, EPA identified 183 more PFAS chemicals which it believed were no longer being manufactured, imported or used in the U.S., with the possible exception of the same uses excluded from the earlier SNURs. However, based on comments received during the public comment period and related communications, EPA learned of additional limited uses of PFAS chemicals. Consequently, those uses for particular chemicals were excluded from the final SNUR. EPA published a Federal Register notice (72 FR 57222, October 9, 2007) finalizing the SNUR on these 183 chemicals.

9. Where can I find more information about PFOA and PFOS?

http://www.epa.gov/region4/water/PFCindex.html

C. BIOSOLIDS BACKGROUND

Further questions about information contained within this section of the document should be directed to EPA's Office of Public Affairs – Dale Kemery (202-564-7839) or Enesta Jones, (202-564-7873).

1. What are Biosolids?

They are nutrient-rich organic materials resulting from the treatment of domestic sewage in a treatment facility. When treated and processed, these residuals can be recycled and applied as fertilizer to improve and maintain productive soils and to stimulate plant growth or as a soil amendment to improve soil quality.

2. Is it acceptable for compost to be made from biosolids?

Yes. Composting is a biological treatment option for biosolids in which a bulking agent, such as wood chips, is mixed with the biosolids. Under controlled aerobic conditions, the bulking agent/biosolids mixture results in an accelerated microbial activity causing the temperature of the mixture to rise. Temperatures are maintained to levels for specific time periods such that pathogens are destroyed and volatile solids are degraded. The end product is a humus-like material that can be applied as a soil conditioner and fertilizer to gardens, food and feed crops, and rangelands.

3. Are there regulations for the land application of biosolids?

Yes. Under Section 405(d) of the Clean Water Act (CWA), EPA establishes numerical limits and management practices that protect public health and the environment from the reasonably anticipated adverse effects of chemical and microbial pollutants in sewage sludge. On February 19, 1993, EPA promulgated the 40 CFR Part 503 Standards for the Use or Disposal of Sewage Sludge, resulting in numerical standards for ten metals and operational standards for microbial organisms. The 1993 rule established requirements for the final use or disposal of sewage sludge when it is: (1) applied to land as a fertilizer or soil amendment; (2) placed in a surface disposal site, including sewage sludge-only landfills; or (3) incinerated. These requirements apply to publicly and privately owned treatment works that generate or treat domestic sewage sludge and to anyone who uses or disposes of sewage sludge.

Biosolids that are to be land applied must meet these regulations and quality standards. The Part 503 rule governing the use and disposal of biosolids contain numerical limits for metals, pathogen reduction standards, site restrictions, crop harvesting restrictions,

monitoring, and record keeping and reporting requirements for land applied biosolids as well as similar requirements for biosolids that are surface disposed or incinerated.

Additionally, Section 405(d)(2)(C) of the CWA states that EPA shall review the sewage sludge regulations not less often than every two years. The purpose of such reviews is to identify additional toxic pollutants that may be present in sewage sludge and, if appropriate, to promulgate regulations for those pollutants consistent with the requirements set forth in the CWA. For Biennial Review 2003, EPA announced the final results of its review of existing sewage sludge regulations to identify additional toxic pollutants that may need to be regulated (www.epa.gov/waterscience/biosolids). In fulfilling this commitment for the Biennial Reviews 2005 and 2007, the Agency searched known databases and the published literature designed to capture available information on occurrence, fate and transport, and human health or ecological effects, as well as other relevant information for pollutants that may occur in U.S. sewage sludge. The Agency subsequently analyzed the information identified by that search and determined that there is not sufficient information at this time on evaluated pollutants to conduct exposure and hazard assessment for deriving scientifically supportable numerical standards. The Agency will continue to assess the availability of sufficient information for pollutants during subsequent biennial reviews pursuant to the CWA section 405(d)(2)(C).

4. Are there regulations for the applications of compost made from biosolids?

Yes. As mentioned above, biosolids are regulated under the authority of Section 405(d) of the CWA. Any final product made from biosolids, such as compost, is also regulated under the CWA. However, composted biosolids, if treated to the highest standards, are considered as "exceptional quality", and can be applied as any other fertilizer or soil amendment. Exceptional quality is characterized as having low inorganic pollutants, is pathogen free, and has reduced degradable components that attract vectors.

5. What is the difference between biosolids and sewage sludge?

Sewage sludge is defined in the Part 503 rule as the solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. The term biosolids is not used in the Part 503 rule, but EPA often uses the terms "biosolids" interchangeably with "sewage sludge." Others outside of EPA often use the term biosolids to describe sewage sludge that has had additional processing for land application.

6. How are biosolids generated and processed?

Biosolids are created through the treatment of domestic wastewater generated from sewage treatment facilities, and separation of liquids from solids. In many larger wastewater treatment systems, pre-treatment regulations require that industrial facilities pre-treat their wastewater to remove many hazardous contaminants before it is sent to

wastewater treatment. This prevents these substances from getting into the sewage sludge.

Once the wastewater reaches the plant, the sewage goes through physical, chemical and biological processes which clean the wastewater and remove the solids. The solids may be treated with any number of options (e.g., treatment with lime to raise the pH or aerobic and aerobic digestion). The wastewater treatment processes sanitize solids to control pathogens (disease-causing organisms, such as certain bacteria, viruses and parasites). In addition, certain management options result in reduced vector attraction. Vectors are any living organism capable or transmitting a pathogen from one organism to another. Vectors for sewage sludge pathogens would most likely include insects, birds, and rodents.

7. Where are biosolids used?

Biosolids are used in agriculture. Agricultural uses of biosolids, that meet strict quality criteria and application rates, have been shown to produce significant improvements in crop growth and yield. Nutrients found in biosolids, such as nitrogen, phosphorus and potassium and trace elements such as calcium, copper, iron, magnesium, manganese, sulfur and zinc, are necessary for crop production and growth. The use of biosolids reduces the farmer's production costs and replenishes the organic matter that has been depleted over time. The organic matter improves soil structure by increasing the soil's ability to absorb and store moisture and makes metals more available to plants.

Biosolids have also been used successfully at mining sites to establish sustainable vegetation and reclaim abandoned mine sites with little or no topsoil, and forestry sites to promote rapid timber growth, allowing quicker and more efficient harvest of an important natural resource. Other uses include ornamental gardens, golf courses, and parks.

8. Where is compost used?

Biosolids may be mixed with wood chips to form compost. This compost may then be used as a soil amendment for vegetable gardens, nursery products, landscaping, and other agricultural uses.

9. How widespread is the use of sewage sludge, and how many farms use biosolids?

About 7.2 million dry tons of sewage sludge are used or disposed of annually in the United States. About 55% of that is applied to the land. The Agency estimates that sewage sludge is applied to less than 1% of available agricultural land in the United States annually. The remaining 45% were disposed of in municipal solid waste landfills, surface disposal units, or incineration facilities.

10. Are biosolids safe?

EPA believes that the Part 503 Standards for Use or Disposal of Sewage Sludge are protective of public health and the environment. In 1996, the National Academy of Sciences (NAS) reviewed practices, public health concerns and regulatory standards, and concluded that the use of these materials in the production of crops for human consumption when practiced in accordance with existing federal guidelines and regulations, presents negligible risk to the consumer, to crop production and to the environment. In 2002, the NAS again reviewed EPA's sewage sludge regulations and public health concerns and concluded that there is no documented scientific evidence that the Part 503 rule has failed to protect public health. However, the NAS also concluded that additional scientific work is needed to reduce persistent uncertainty about the potential for adverse human health effects from exposure to biosolids. The Agency believes that the current regulations are protective, but further research is needed. EPA recognizes that uncertainty persists and new challenges are emerging so we are working proactively to strengthen the science and fill the gaps in our knowledge.

11. What is the Agency's position on the use of biosolids?

EPA believes that the Part 503 standards for Use or Disposal of sewage sludge are protective of public health and the environment. EPA supports biosolids management in full compliance with the regulations. Biosolids management options allowable under Part 503 include land application, surface disposal, and incineration. The choice regarding which management options to use are local decisions subject to state and federal regulations.

12. Where can I find out more about the regulations?

The biosolids rule is described in the EPA publication A Plan English Guide to the EPA Part 503 Biosolids Rule (http://www.epa.gov/owm/mtb/biosolids/503pe/index.htm). This guide describes the Part 503 rule for the general reader. This guide is also available in hard copy. In addition to the Plain English Guide, EPA has prepared A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule (http://www.epa.gov/owm/mtb/biosolids/503rule/index.htm) which shows the many steps followed to develop the scientifically defensible safe set of rules.