

GEC Comments to the Glynn County Board of Education Concerning the January 29, 2008, EPA Presentation

The Glynn Environmental Coalition (GEC) is providing the following information for your use when discussing the issues surrounding the testing of Altama Elementary School. The EPA Region 4 presentation to the Board of Education on January 29, 2007, is a continuation of a decision made in 1991 to NOT report all chemicals present by development of an analytical method for toxaphene that is only used in Glynn County, which was found inappropriate by the EPA Office of Inspector General (OIG). The GEC trusts the following information will provide a firm basis for our concerns, which resulted in the EPA OIG agreeing that all chemicals present should be reported.

Summary of the issues:

In 1991, the EPA, Georgia EPD, and Hercules had a meeting in which they agreed to change the analytical method for toxaphene to report toxaphene and "some other product". The new method only reported toxaphene chemicals from the back half of the chromatogram. When toxaphene enters the environment as a mixture of over 670 chemicals, shifts in ratios of chemicals occurs by the most chlorinated losing a chlorine atom or two and becoming the persistent form that appears in large quantities in the front half of the chromatogram. In 1997, the analytical method was changed further by eliminating any toxaphene chemicals not present in the same ratio as the calibration standard, further excluding toxaphene chemicals from quantification and reporting. The EPA OIG found these analytical method changes made by EPA Region 4 inappropriate. EPA Region 4 responded by developing another method that only measures 3 toxaphene chemicals (only found after people or fish metabolize the chemicals). This method would report none or ~3% of the toxaphene present. The EPA OIG said not to use the method and further stated that the Hp-Sed and Hx-Sed (toxaphene with 6 and 7 chlorines, which are the ones present in large amounts) should be reported. EPA Region 4 has steadfastly refused to report these toxaphene chemicals that are present in the largest amounts in defiance of the EPA OIG. (Under the Hercules Patent, toxaphene includes all chlorinated camphene with 3 to 10 chlorines attached)

At the Hercules 009 Landfill Superfund Site, a toxaphene cleanup level was set based upon the assumption that the other toxaphene manufacturing waste chemicals such as dioxin would be cleaned up to safe level. By not reporting all toxaphene present, other chemicals will not be cleaned up.

The EPA OIG use the example from our community where 56 fish samples from Terry Creek were analyzed by the inappropriate method and no toxaphene was reported in any sample. When re-analyzed by Negative Ion Mass Spectroscopy (NIMS), the fish had up to 26 ppm, or 56 times the EPA "Do Not Eat" level. Obviously, the inappropriate method is a health threat to all in our community and re-testing is needed. A similar situation could be occurring at Altama Elementary School, but like Terry Creek we will only know after appropriate testing is conducted.

EPA Region 4, Georgia EPD, and Hercules are united in their effort to keep all toxaphene chemicals being from being reported. The EPA's presentation to the Board of Education went one step further and declared, "...toxaphene breakdown products in soil do not pose a human health risk." The EPA did not produce any studies or data to support their contention that a poison and carcinogen do not pose a human health risk, but there are numerous studies to the contrary that are discussed in the Agency for Toxic Substance and Disease Registry (ATSDR) Toxicological Profile for Toxaphene. Furthermore, the EPA OIG interviewed the ATSDR toxicologist whom estimated only 10% of the toxaphene present was

being reported.

Toxaphene is present in our community up to 8% in soils (yes, that is percent, or 88,000 ppm). Around 2-3 million pounds of toxaphene were released into our estuary. Four toxic sites have not been investigated or cleaned up that contain toxaphene.

EPA Region 4 has made a decision to continue to NOT report all chemicals present and declare toxaphene does not pose a health risk, even when all the chemicals present has not been determined. The GEC would like to resolve this situation in cooperation with the Glynn County BOE in a manner that does not alarm parents or children.

The Glynn County BOE needs to be satisfied that:

- Chemicals have not been left on school property;
- Sufficient information is available to conduct drainage ditch maintenance activities without recontamination; and,
- School property is not encumbered by chemical contamination.

The GEC is providing the following information in the form of a rebuttal to the EPA's presentation to the BOE. Please do not hesitate to ask if you need clarification or documents cited.

- Slide: Removal and Testing... There were two removal actions on school property. The one that extended along the ditch and to the playground was not included by EPA Region 4. Contrary to the contentions of the EPA, toxaphene contamination was found in 1995 up to and abutting the school playground, which the GEC is cognoscente and a factor in our request for retesting the school (See Attachment A). School property was tested after the removal action and levels up to 84 ppm remained. Notable is that the EPA presentation excluded this area that extends to the playground from the removal action presented to the BOE, which further emphasizes the need for retesting the school. It is unknown why EPA Region 4 would withhold information about the removal action and the extent of contamination on school property.

- Slide: Sampling and Analysis... 1.) EPA claims sampling of the school yard is not part of Superfund or the Superfund Site, but the EPA has this data as part of the Site record, as indicated by being part of the presentation, and the EPA actually tested the soil (See Attachment B).

2.) The EPA contends that in 1993, there was no method for weathered toxaphene, which is incorrect. EPA Method 8080 at the time provided for reporting "total toxaphene" or "apparent toxaphene". EPA Region 4, Georgia EPD, and Hercules changed this analytical method through an agreement in 1991 to reporting toxaphene and "some other product". The analytical method developed was called the "Toxaphene Task Force" (TTF) method, and after further changes in 1997 called the "Hercules Protocol". The OIG called the method EPA (Region 4) Method 8081. At the meeting in 1991 where the agreement was struck between EPA Region 4, Georgia EPD, and Hercules, all parties agreed that they had previously tested for apparent toxaphene that reports all chlorinated camphene present, including what is now called "degraded" toxaphene, which is the same as toxaphene manufactured but now present in different amounts of the individual chemical components.

The EPA OIG discussed the changes made to EPA Method 8081 by EPA Region 4 and how toxaphene in soil was underestimated, and out rightly not reported when known to be present.

"However, EPA (Region 4) Method 8081 is not effective for detecting degraded toxaphene (i.e., "weathered" toxaphene) in environmental samples (e.g., soil, water, fish). For demonstration purposes, chromatogram 3A below is a known chromatogram of toxaphene degradation products in soils. When chromatogram 3A is compared by EPA Method 8081's identification criteria for technical toxaphene, chromatogram 3A obviously does not have the 22 same late eluding peak profile (i.e., the peaks after 29 minutes) as the technical toxaphene standard. **Therefore, a match is not made and the presence of toxaphene is not reported by the laboratory, even though specific toxaphene congeners (e.g., Hx-Sed and Hp-Sed) are known to be present.** This example demonstrates the manner in which EPA (Region 4) Method 8081 fails to detect toxaphene degradation products (i.e., "weathered" toxaphene or individual toxaphene congeners) in environmental samples."

The OIG's observation that toxaphene was present when none was reported by the TTF and Hercules Protocol methods is the same conclusion other studies have reached and confirmed through analysis. The OIG suggested that the observed compounds might be "toxaphene breakdown products", but many of the prominent chlorinated camphene (PCC) found in the front half of the chromatogram are associated with unmodified toxaphene or PCC as manufactured by Hercules. [\[i\]](#), [\[ii\]](#), [\[iii\]](#), [\[iv\]](#)

The EPA Region 4 chemist, who also participated in the development of the TTF method, noted that the "latter peaks" in samples were decreased and the "early peaks" were increased in environmental samples from Brunswick, and that the TTF method may seriously underestimate the true concentration of toxaphene. [\[v\]](#), [\[vi\]](#) The Georgia Environmental Protection Division chemist that participated in development of the TTF method noted that unknown peaks not quantified may have been toxaphene related and the total area method was not used when the TTF method was applied. [\[vii\]](#) EPA Method 8081 requires that results report total toxaphene present, which was not done at Altama Elementary School. It is very unusual that analysis is conducted and chemical compounds present are not reported, as with the TTF method. Appropriate analytical methods, intended to protect human health and the environment, include the reporting of unidentified compounds when they are encountered.

Dr. R. Kevin Pegg, the community's Technical Advisor provided by an EPA Grant, summarized the analytical methods used in Glynn County, Georgia as follows:

Total Area Method

This is the basic method required by the US EPA for chemicals with multiple congeners. It detects technical, weathered and biological grades of toxaphene, as well as the off-grade product and manufacturing residue forms. Basically, all of the possible toxaphene chemicals are detected and added together to quantify total toxaphene. This method was not used by the EPA in Brunswick, Georgia, but is used at other EPA sites in the United States and by other governments and researchers around the world.

Toxaphene Task Force Method

This method was developed by EPA Region 4 in Atlanta, Georgia, with Hercules Inc., and the State of Georgia. While gas chromatography is still used, only a few of the chemicals specific for technical toxaphene are used in the analysis. Even if other toxaphene chemical congeners are present, they are ignored. The toxaphene task force method (referred to as EPA Method 8081) detects technical grade toxaphene as well as the total area method; however 8081 does not detect all off-grade products, does not detect some forms of manufacturing residue toxaphene, and can only detect weathered toxaphene in the first few years after placing in the environment. The TTF method does not detect toxaphene after it has been in the environment for several years, and it does not detect biological toxaphene. The TTF

method is apparently used only in Glynn County Georgia and nowhere else in the world. The method is not recognized by other governments or by researchers as a useful method because it under-reports the actual toxaphene concentration.

GC negative ion mass spectroscopy

This technique, called the NIMS method, can detect all forms of toxaphene and is a widely respected method with a high degree of scientific merit regarding the interpretation of results. It is especially useful for detecting biological forms of toxaphene accumulation.

- **Slide: Altama Elementary Sampling Results...** The three congener method the OIG warned not to use is presented under Simon/Manning. The EPA OIG noted:

"The other toxaphene degradation congeners of principal concern for the human health evaluation (e.g., p26, p50, and p62) would only become the dominant congeners upon the subsequent metabolism of this microbially degraded toxaphene (e.g., Hx-Sed and Hp-Sed) by higher organisms (e.g., fish or humans). Therefore, if the EPA or PRP (Potentially Responsible Parties) test a site for only the p26, p50, and p62 congeners, the EPA or PRP will significantly under estimate the amount of contamination by toxaphene degradation products at the site."

It is notable that EPA Region 4 continues to advocate for toxaphene analytical methods that will underestimate or fail to detect the chemicals of concern present. Obviously, the toxaphene on school property and in the water has not been degraded by the metabolism of fish or humans. EPA Region 4's introduction of Simon and Manning PRGs is meaningless to the discussion and meant to confuse the BOE. This is EPA Region 4 implementing a method the OIG specifically said not to because it would under estimate the amount present.

- **Slide: Drainage Ditch ...** The EPA has never explained how toxaphene crossed a 6 foot deep ditch and went hundreds of feet onto school property. As noted previously, there were two removal actions on school property. The one that extended along the ditch and to the playground was not included by the EPA. Contrary to the contentions of the EPA, toxaphene contamination was found in 1995 up to and abutting the school playground, which the GEC is cognoscente and a factor in our request for retesting the school (See Attachment A). School property was tested after the removal action and levels up to 84 ppm remained. Notable is that the EPA presentation excluded this area from the removal action presented to the BOE, which further emphasizes the need for retesting the school. It is unknown why EPA Region 4 would withhold information about the removal action and the extent of contamination on school property. The OIG interviewed two experts that independently estimated the inappropriate method used on school property would report around 10% of the toxaphene present, which leaves doubt about the protectiveness of the cleanup.

- **Slide: 2005 Office of Inspector...** EPA Region 4 made a gross misrepresentation of the OIG findings, and attempted to re-write history the way EPA Region 4 wants it to read. The GEC presented 128 concerns about the remediation of the Hercules 009 Landfill Superfund Site. The OIG addressed only 3 of the concerns. One of the 128 the GEC did raise concerns about was retesting areas previously tested by the inappropriate method. As noted previously, the EPA OIG advocated for testing soil when there were doubts about the testing conducted previously. As EPA Region 4 noted, risks were to be evaluated, which cannot be completed without identifying chemicals of concern present.

The EPA OIG noted:

"When toxaphene contamination is suspected, the groundwater and **soil** analyses should test for Hx-Sed and Hp-Sed because they would be the dominant toxaphene degradation products."

"In my opinion, the published science is clear that the dominant congeners generated by the microbial breakdown of technical toxaphene in **soil** are Hx-Sed and Hp-Sed with the other toxaphene congeners being present at much lower levels. Therefore, if the EPA or the potentially responsible party (PRP) are testing to determine the nature and extent of the contamination at a site by toxaphene degradation products, the dominant toxaphene congeners in the **soil** or groundwater samples will be Hx-Sed and Hp-Sed."

EPA Region 4's contention that the OIG focused on only water appears to be intentionally misleading. The OIG noted extensively that EPA Region 4 was steadfast in their refusal to report all chemicals present and has engaged in reporting only some of the chemicals known to be present since 1993, which is prior to the testing of Altama Elementary school by the three parties (EPA Region 4, Georgia EPD, and Hercules) that developed the inappropriate method.

The OIG noted:

"Unfortunately, EPA Region IV and I continue to disagree as to whether environmental testing for toxaphene degradation products by the GC/NIMS methodology should include Hx-Sed and Hp-Sed. Region IV does not agree with the OIG's stated opinion that Hp-Sed and Hx-Sed congeners need to be definitively determined in environmental testing for toxaphene degradation products."

- **Slide: 2006 Groundwater...** Again, EPA is implementing Simon & Manning, even though the OIG said it would underestimate amount present.

- **Slide: Toxaphene Exposure...** EPA Region 4 presented irrelevant information about toxaphene exposure in the Netherlands. Unlike the Netherlands, the school is sitting next to a Superfund Site containing the manufacturing wastes from the production of toxaphene with documented releases and failures to control migration to drainage ditches and school property. Furthermore Toxaphene was manufactured in Brunswick and the wastes, including dioxin, were disposed in the landfill. It is all the manufacturing waste chemicals that are a concern, and not just technical toxaphene. The landfill contains toxaphene manufacturing wastes and off-grade product that will have much different chemicals ratios and contaminants than the toxaphene pesticide sold for agricultural use. For these reasons, it is imperative to test for and report all chemicals present.

- **Slide: Re-evaluation of Site Risks** 1.) EPA Region 4 recalculated risk from toxaphene and published it as Simon & Manning. The OIG explicitly said the calculations should be provided. The GEC asked for the calculations from EPA Region 4 and they could not produce the calculations, nor would the authors. The GEC has this correspondence from EPA Region 4.

2.) EPA Region 4 claims prevalent congeners (Hx-Sed and Hp-Sed, or toxaphene with 6 and 7 chlorines attached) are of lesser concern because they are eliminated from the body quickly. No data in support was presented, but there is a lot to the contrary.

3.) EPA claims there is no screening criteria for prevalent congeners, which is incorrect. Prior to the meeting in 1991 when an agreement was made to change EPA Method 8081, the parties agreed

previous testing did report "total" or "apparent toxaphene," which did report all toxaphene chemicals present. Furthermore, the method advocated by the OIG, Gas Chromatography - Negative Ion Mass Spectroscopy (GC-NIMS) has been used in Glynn County for fish and water since at least 2000 and has been identifying and quantifying the very chemicals EPA Region 4 claims there are no screening criteria. Under the Performance Standards Act, scientifically accepted and peer reviewed analytical methods can be used by the EPA. In the case of NIMS, the EPA has been using the method for over 20 years and the results extensively published in scientific peer reviewed journals. EPA Region 4 inferred that since research is being conducted about analytical methods that testing cannot be done at the school, which is misleading and outright wrong. The presentation concerning risks appears to be intended to baffle and confuse the BOE concerning the OIG findings, recommendations, and appropriate methods to test the school to definitively determine risk to students.

- **Slide: Region 4 Response...** EPA Region 4 claims weathered toxaphene poses less risk, but produced no data in support. Available science contradicts EPA Region 4's position, and identifies the chemicals being excluded and not reported as being MORE toxic than the technical toxaphene mixture. The ATSDR Toxicological profile for Toxaphene states:

"Toxaphene components A and B have been isolated and found to possess toxicity that is 6 and 14 times greater, respectively, than the technical toxaphene mixture as measured by comparing intraperitoneal LD50 values in mice (Casida et al. 1974). Toxicant A has been identified as a mixture of 2,2,5-endo,6-exo,8,8,9, 10-octachlorobomane and 2,2,5-endo,6-exo,8,9,9,10- octachlorobomane (Matsumura et al. 1975; Turner et al. 1975) and **toxicant B has been identified as 2,2,5- endo,6-exo,8,9, 10-heptachlorobomane** (Casida et al. 1974). **It has further been determined that toxicant B and four of its derivatives, each with an additional chlorine atom at position 3-exo,8,9, or 10, may be responsible for the bulk of toxaphene's acute toxicity** (Saleh et al. 1977)."

Important to note is that the EPA OIG identified toxicant B, Hp-Sed, as being one of the most prevalent chemicals present. Attachment C identifies the congeners that are accepted as being technical toxaphene, which do include the very chemicals EPA Region 4 continues to advocate for not reporting, even when they are known to be present. As Attachment C demonstrates, EPA Region 4 has arbitrarily excluded chemical components of the technical toxaphene mixture with 6 and 7 chlorines attached (Hp-Sed and Hx-Sed), which are the chemical components identified by the OIG as most prevalent, and as the most toxic by ATSDR.

Contrary to the contentions of EPA Region 4 that these chemicals pose less risk and lesser concern, ATSDR found:

"Information on the toxicities of components in the original mixtures is limited to perhaps 10 congeners, the most familiar being the appreciably toxic and persistent toxicant A and toxicant B."

The ATSDR Toxicological profile for Toxaphene states the following about the toxicological effects of toxaphene on children:

"Pregnant women, fetuses, nursing infants, and very young children may be at greater risk of adverse health effects from pesticide exposure than the general population (Calabrese 1978). Exposure to organochlorine insecticides, such as toxaphene, may adversely affect reproductive physiology (i.e., hormonal balance) in certain women (Calabrese 1978). Embryos, fetuses, and neonates up to age 2-3 months may be at increased risk of adverse effects following pesticide exposure because their enzyme

detoxification systems are immature (Calabrese 1978). Animal studies suggest that detoxification of the toxaphene mixture may be less efficient in the immature human than the metabolism and detoxification of the single components such as toxicant A or B (Olson et al. 1980). Infants and children are especially susceptible to immunosuppression because their immune systems do not reach maturity until 10-12 years of age (Calabrese 1978)."

"Animal studies suggest that detoxification of the toxaphene mixture may be more inefficient in immature animals and possibly also in children than the metabolism and detoxification of the single components such as toxicant A or B."

"Humans living in areas surrounding hazardous waste sites may be exposed to toxaphene via ingestion of contaminated water or even ingestion of soil, particularly by children. Inhalation exposure to toxaphene via volatilization from contaminated water or soil may also occur."

"Subsets of the human population that may be unusually susceptible to the toxic effects of toxaphene include pregnant women, their fetuses, nursing babies, young children, people with neurologic diseases (particularly convulsive disorders), and individuals with protein-deficient diets. Others at increased risk include people with hepatic, cardiac, renal, or respiratory diseases, those with immune system suppression, and those ingesting alcohol or consuming therapeutic or illicit drugs."

Slide: Conclusions... 1.) EPA Region 4, based upon the use of previous testing from 1993 the OIG found inappropriate, concluded there is no site related impact. Relying on an analytical method known to exclude the chemicals that are most prevalent and most toxic underscores EPA Region 4's effort to prevent testing that will report all chemicals present.

2.) EPA Region 4's claim that toxaphene does not poses a health risk is not supported by data but rather a flimsy argument that there is no risk to students if unknown chemicals are present. Risk cannot be determined until the school is tested and all chemicals present are reported.

In closing, the cleanup of the Hercules 009 Landfill Superfund Site was based upon cleaning up toxaphene to 0.25 ppm would also cleanup the other chemicals such as dioxin, a waste product from the manufacture of toxaphene. If all the toxaphene chemicals are not reported, the other toxic chemicals in the toxaphene manufacturing wastes will not be cleaned up. The first step in protecting children is to report all chemicals present on Altama Elementary School property. In addition, sufficient information should be collected to assure the Glynn County BOE that drainage ditch maintenance can be conducted without recontamination, and school property is not encumbered by chemical contamination.

[\[i\]](#) Keith A. Maruya, Wakeham, S.G., Analysis of Toxaphene Residues in Sediment and Fundulus from Terry/Dupree Creek. Skidaway Institute of Oceanography, University System of Georgia. July 31, 1998.

[\[ii\]](#) Keith A. Maruya. Analysis of Toxaphene Residues in Fin- and Shellfish from Terry/Dupree Creek, Glynn County, Georgia. Skidaway Institute of Oceanography, University System of Georgia. June 16, 2000.

[\[iii\]](#) Health Consultation - Terry Creek Dredge Spoils Areas/Hercules Outfall Brunswick, Glynn County, Georgia. Agency for Toxic Substance and Disease Registry. December 7, 1999.

[\[iv\]](#) Analytical and Environmental Chemistry of Toxaphene. Pergamon Press. February 1993.

[\[v\]](#) Telephone Memorandum to Lavon Revells, US EPA; from Dan Keck, Black & Veatch Waste Science, Inc. July 27, 1995.

[\[vi\]](#) Telephone Memorandum to Gary Bennett, US EPA Environmental Services Division; from Kristen Lombard, Black & Veatch Special Projects, Corp. May 16, 1996.

[\[vii\]](#) Memorandum from Danny Reed, Georgia Environmental Protection Division; to Dr. Randy Manning, Georgia Environmental Protection Division, October 1, 1996.