

Mission:

To protect, promote & improve the health of all people in Florida through integrated state, county & community efforts.



Rick Scott
Governor

Celeste Philip, MD, MPH
Surgeon General and Secretary

Vision: To be the **Healthiest State** in the Nation

Toxicology Consult

Date: February 20, 2018

From: Kendra F. Goff, PhD, DABT, CPM, CEHP, State Toxicologist & Chief
Bureau of Environmental Health

Requested by: Florida Department of Environmental Protection (DEP)

PURPOSE:

The 31-acre Kerr-McGee hazardous waste site at 1611 Talleyrand Avenue is in a highly industrialized area on the St. Johns River in Jacksonville, Duval County, Florida 32206-5435. Florida Department of Health (DOH) evaluates the public health threat of hazardous waste sites through a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry in Atlanta, Georgia. DOH evaluated health effects associated with metals and pesticides from the Kerr-McGee hazardous waste site in Jacksonville, Florida and published two documents, Public Health Assessment, August 29, 2003 and Public Health Assessment, Final Release-January 14, 2014.

A health concern has been raised to whether fish from the St. Johns River near Kerr-McGee hazardous waste site are safe to eat. In the 2003 PHA, the DOH recommended testing of fish and shellfish for metals and pesticides, if in the future people eat fish or shellfish from the St. Johns River near the site. The assessment noted fishing from the St. Johns River near the site is limited. The water along the shoreline is deep and swiftly moving. DOH-Duval reported that although people may eat fish and shellfish from other parts of the St. Johns River, the strong current and industrial ship traffic on this part of the river make pleasure or subsistence fishing from small boats unlikely. There is also no shore access near the site. Therefore, the Department eliminated eating fish or ingesting surface water from the St. Johns River near the Kerr-McGee site as an exposure pathway. However, due to continued community concerns about the safety of eating fish from the St. Johns River in close proximity to Kerr-McGee, the Department agreed to provide a consult to DEP, when additional information became available.

On November 15, 2017, DEP requested DOH review new data and evaluations provided by AECOM for Fish Tissue Sampling Results from the St. Johns River, Kerr-McGee Chemical Corporation Superfund Site, Jacksonville, Florida.

METHODS:

Fish were collected on April 5 and 7, 2017, near the site and presented in the AECOM Technical Memorandum, October 17, 2017. At some stations, samplers were not successful catching fish due to boat traffic, inability to anchor or weather and river conditions. A total of 32 fish were caught with 29 sent for testing including weakfish (*Cynoscion regalis*), whiting (*Merlangius merlangus*), mangrove snapper (*Lutjanus griseus*) and Atlantic croaker (*Micropogonias undulatus*).

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Fish fillet samples were analyzed for elemental and methyl mercury, selected organochlorine pesticides and selected polychlorinated biphenyls (PCBs).

RESULTS and FINDINGS:

Pesticides, PCBs, and mercury were found in every fish sample analyzed. However, fish collection for three of the four species obtained were very limited. Only one individual Atlantic Croaker, two Mangrove Snappers and one Whiting were collected. The Department requires a minimum of eight fish of each species when performing evaluations of contaminant levels in fillets. Weakfish was the only species that met this criterion with 17 specimens harvested.

Weakfish

Contaminant	Average Concentration (ug/kg)	Number of Fish Analyzed
Aldrin	0.17	17
Dieldrin	2.24	17
Aroclor 1242	163.5	17
Aroclor 1254	157	17
Aroclor 1260	102.5	17
Total PCBs	243.9	17
PCB 118	5.48	17
PCB 126	0.014	17
MeHg ^a	104	17

^a Methyl mercury

The acceptable risk level (ARL) for carcinogenic chemicals that is used for consumption advisories for fish is not bounded by a legally enforceable limit. For DOH, the acceptable level for carcinogenic risk for fish consumption advisories is 1E-5 (1 in 100,000) and assuming a recreational fisherman would be allowed to fish daily. The technical approach used to provide meal consumption advisories followed the risk assessment process recommended by the Environmental Protection Agency (USEPA, 1986a; 1986b; 2000).

Calculation of Daily Consumption Limits:

The calculated daily consumption limit (CR_{lim}) represents the amount of fish (in kilograms) expected to generate a risk no greater than the maximum ARL used at that consumption limit based on an upper bound estimate of residency (30 years) over a person’s lifetime (70 years). Please note, that consumption limits for non-cancer effects were also calculated. However, cancer effects were a more sensitive indicator of risk and considered more relevant. The methodology used is as follows:

$$CR_{lim} = \frac{ARL \times BW \times ED}{(\sum Cm \times CSF) \times AT}$$

where

CR_{lim} = maximum allowable fish consumption rate (kg/d)

ARL = maximum acceptable individual lifetime risk level (unitless) (1E-5)

BW = consumer body weight (70 kg)

ED = exposure duration (30 years)

AT = averaging time (70 years)

CSF = cancer slope factor [(mg/kg-d)⁻¹], chemical specific

C_m = measured concentration of chemical *m* in (mg/kg), chemical specific

Calculation of Meal Consumption Limits:

Daily consumption limits may be more conveniently expressed as the allowable number of fish meals of a specified meal size that may be consumed over a given time. The consumption limit is determined in part by the size of the meal consumed. An 8-oz (0.227-kg) meal size was used for these calculations. Daily consumption limits, the number of allowable kilograms per day (CR_{lim}), can be converted to the number of allowable meals per month using the following equation:

$$CR_{mm} = \frac{CR_{lim} \times T_{as}}{MS}$$

where

CR_{mm} = maximum allowable fish consumption rate (meals/month)

CR_{lim} = maximum allowable fish consumption rate (kg/d)

MS = meal size (0.227 kg fish/meal or 8 oz.)

T_{ap} = time averaging period (365.25 d/12 month = 30.44 d/month).

Inputs for Carcinogenic Chemicals Detected in the Weakfish Fillets:

	Value	Units	Notes
Risk Level	1.000E-05	Unitless	1 in 100,000
Body Weight	70	kg	
Time Averaging Period	30.44	Days/month	
Meal Size	0.228	kg/meal	8 ounces

Cancer Oral Slope Factors	IRIS
Aldrin	1.7 x10 ¹ per mg/kg-day
Dieldrin	1.6 x10 ¹ per mg/kg-day
Aroclor 1242	N/A
Aroclor 1254	N/A
Total PCBs	2 per mg/kg-day
PCB 118	N/A
PCB 126	N/A
MeHg	N/A

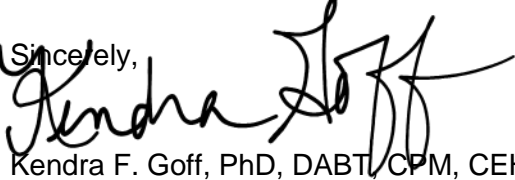
Using these assumptions, the CRLim (maximum allowable fish consumption rate (kg/d)) is calculated to be 6.27E-4 kg/day. This results in an acceptable number of meals per month of 0.38 or 4.52 meals per year.

Based on the concentrations of total carcinogenic risk and the minimal number of safe meals per month, DOH recommends that a “Do Not Eat” advisory be issued for the reach of the St. Johns River evaluated by this assessment.

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This assessment will be added to the DOH publication "Your Guide to Eating Fish Caught in Florida," found on the website: http://www.floridahealth.gov/programs-and-services/prevention/healthy-weight/nutrition/seafood-consumption/_documents/advisory-brochure.pdf.

If you have additional questions or would like further information, please contact me at kendra.goff@flhealth.gov or Andrew Reich at andy.reich@flhealth.gov.

Sincerely,

Kendra F. Goff, PhD, DABT, CPM, CEHP
State Toxicologist & Chief

KFG/ar