

**STATE OF GEORGIA
TMDL IMPLEMENTATION PLAN**

MERCURY AND FISH CONSUMPTION GUIDELINES DUE TO MERCURY

Prepared by
The Georgia Department of Natural Resources
Environmental Protection Division
Atlanta, GA

TMDL Implementation Plans are platforms for establishing a course of actions to restore the quality of impaired water bodies in a watershed. They are intended as a continuing process that may be revised as new conditions and information warrant. Procedures will be developed to track and evaluate the implementation of the management practices and activities identified in the plans. Once restored, appropriate management practices and activities will be continued to maintain the water bodies.

Impaired Waterbody	Location	River Basin
Ochlockonee River	SR 37 downstream Moultrie to upstream CR222	Ochlockonee
Ochlockonee River	Bridge Cr. to Big Cr. W. of Coolidge	Ochlockonee
Ochlockonee River	Oquina Creek to Stateline	Ochlockonee
Satilla River	U.S. Highway 84/Ga. Hwy. 38 to 6 miles downstream Hwy 15/121	Satilla
Satilla River	Six miles d/s of Ga. Hwy. 15 to Bullhead Bluff	Satilla
Turtle River System	Brunswick: Turtle River, Buffalo River, and South Brunswick River	Satilla
Terry Creek	Brunswick	Satilla
Dupree Creek	Brunswick	Satilla
Purvis Creek	Brunswick	Satilla
Gibson Creek	Brunswick	Satilla
N. Prong St. Marys River	Cedar Cr. to S. Prong St. Marys River	Saint Marys
N. Prong St. Marys River	Headwaters to Cedar Cr.	Saint Marys
St. Marys River	S. Prong St. Marys River to St. Marys Cut	Saint Marys
Suwannee River	Mainstem-Suwannee Canal to Stateline	Suwannee
Turkey Branch	Headwaters to Withlacoochee River downstream Fitzgerald	Suwannee
Alapaha River	Sand Creek to U.S. Hwy. 129/Ga. Hwy. 11	Suwannee
Alapaha River	U.S. Hwy. 129/Ga. Hwy. 11 to Stateline	Suwannee
Withlacoochee River	Little River to Stateline	Suwannee
Withlacoochee River	Bay Branch to Little River	Suwannee
Withlacoochee River	New River to Bay Branch	Suwannee
Double Run Creek	Upstream SR 90 to Alapaha River near Rebecca	Suwannee
Withlacoochee River	Hardy Mill Creek to New River	Suwannee
Suwannee Canal	Okefenokee Swamp	Suwannee
Banks Lake	Lanier County	Suwannee

MERCURY AND FISH CONSUMPTION GUIDELINES DUE TO MERCURY

INTRODUCTION

The Environmental Protection Agency has developed total maximum daily load (TMDL) documents for several streams in Georgia that are on the 303(d) list for mercury and fish contaminated with mercury. These TMDLs may be revised when more information is available. Therefore, EPA proposes a phased approach. This phased approach recognizes that with more information, the assumptions on which the TMDL is based may have to be modified to achieve compliance with any applicable water quality standard. Implementation of the TMDL should also follow a phased approach and be subject to changes as more information becomes available.

DISCUSSION OF THE POLLUTANT

Mercury is a toxic metal and a naturally occurring element found throughout the environment. It is commonly seen as a shiny, silver-white, odorless liquid metal. According to EPA, mercury is one of the persistent, bioaccumulative, and toxic, or PBT, pollutants. Human activity can cause a release of mercury increasing the presence of this toxic element in the atmosphere. The three forms of mercury are methyl, elemental, and inorganic. The elemental or inorganic forms are usually the forms released to the environment. Methylmercury is an organic form that is more toxic and bioaccumulates in the food chain.

The main concern is the exposure to mercury of the developing fetus. Because its brain is rapidly developing, the fetus is more sensitive, and women of childbearing age are at the greatest risk. Human exposure to mercury occurs through the consumption of contaminated fish, as mercury concentrations in the air are usually low. Other groups at risk are subsistence fishermen and some native American populations.

POLLUTANT SOURCES

EPA attributes 99% of the mercury in our water to atmospheric deposition. Only 1% is said to come from point sources. In water, the mercury is changed by biological processes to methylmercury which bioaccumulates in fish. The largest sources of mercury air emissions are:

- Coal-fired electrical utilities
- Municipal waste combustors
- Medical waste incinerators
- Hazardous waste combustors

Other sources of mercury include manufacturing activities, mining, and wastewater effluents.

There is not much data on mercury concentration in wastewater effluents. These point sources are listed in the TMDLs as having the potential to discharge mercury but, until recently, the method for analyzing mercury was not sensitive enough to measure the low trace levels found in effluents.

SOLVING THE PROBLEM

Mercury coming from power plant stacks and other sources is carried by the wind and can travel for great distances depending on atmospheric conditions. This is a global problem and EPA is working with other countries to limit mercury releases worldwide. EPA will propose limits on mercury emissions from coal and oil fired power plants by December 15, 2003 and issue final regulations by December 15, 2004. According to the TMDLs for fish contaminated with mercury, "EPA expects that a combination of ongoing and future activities under the Clean Air Act will achieve reductions in air deposition of mercury that will enable achievement of water quality standards."

EPA finalized rules for municipal waste combustors and hospital incinerators and there was almost 90% reduction in mercury emissions from 1995 to 2000 from these sources. A voluntary agreement has been achieved between the American Hospital Association and EPA to eliminate mercury waste by 2005 from hospitals.

Industrial demand for mercury declined approximately 75% from 1988 to 1996. For example, mercury is no longer added to paint or pesticides and is used less in batteries.

SUPERFUND SITE

The LCP Chemicals Superfund Site is undergoing remediation by EPA. This site was the cause of mercury contamination in the Turtle River System, Purvis Creek, and maybe other streams in the Brunswick area. See the attached papers entitled "Georgia NPL/NPL Caliber Cleanup Site Summaries" and "U. S. Environmental Protection Agency Remedial Investigation Fact Sheet" for more information.

IMPLEMENTATION OF THE TMDL

NPDES major facilities on a 303(d) listed stream for mercury or fish contaminated with mercury will have a monitoring requirement put in the permit. The permittee will characterize the effluent and the source of drinking water in the area for mercury concentrations through this monitoring. If the mercury concentration in the effluent is greater than the water quality target mentioned in the TMDL or greater than the mercury concentration in the source of drinking water, then the permittee will have to develop and implement a mercury minimization plan. This mercury minimization plan will involve source identification and then the reduction and elimination of mercury from the effluent.

Air point sources will continue to reduce emissions of mercury through implementation of the Clean Air Act. EPA and the regulated community will improve the mercury air

emissions inventory. EPA will revise the mercury air deposition model to get better characterizations of the sources of mercury.

MONITORING PLAN

EPA and EPD will continue to collect ambient data on mercury concentrations in water, sediments, and fish.

EDUCATION/OUTREACH ACTIVITIES

The Environmental Protection Division will continue to provide guidance and education to the public on all water quality issues through outreach by the Water Protection Branch. The Pollution Prevention Assistance Division is another excellent resource for this outreach. When necessary, the Department of Natural Resources will issue fish consumption guidelines. These guidelines are updated annually, identify specific stream segments where there is a problem, and list all known species of fish with mercury contamination and how often they may be consumed.



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Georgia NPL/NPL Caliber Cleanup Site Summaries

Superfund (CERCLA) Cleanups

Corrective Action (RCRA) Cleanups

Managing Wastes

Emergencies

Federal Facilities

Risk Assessment

Brownfields

LCP Chemicals Georgia Inc.

EPA ID: GAD099303182

Brunswick, Glynn County, GA

Congressional District: 01

NPL Status: Proposed: 10/02/95; Final 06/17/96

[Project Manager](#)

Administrative Record Index ([Adobe Reader Required](#)): [Removal](#)

Site Repository:

Brunswick/Glynn Co. Regional Library

208 Gloucester St.

Brunswick GA 31523

Documents:

[Fact Sheet, June 2002 \(PDF, 22K\)](#)

Site Background:

The LCP Chemicals Superfund Site consists of 550 acres, the majority of which is a tidal marsh. An oil refinery, a paint manufacturing company, a power plant, and a chlor-alkali plant have all operated at this site over the last 70 years. Mercury, polychlorinated biphenyls (PCBs), and semi-volatile contamination are prevalent across the plant site soils, in groundwater, and in the biota in the marsh. Since 1919 this site has been occupied by at least five major companies: Atlantic Refining Company (ARCO); Georgia Power Company; Dixie Paints and Varnish Company (currently, the O'Brien Company); Allied Chemical Inc. (currently, Allied Signal); and, the Hanlin Group subsidiary, LCP Chemicals-Georgia, Inc..

The contamination of greatest concern at this Site is a large dispersion of mercury and polychlorinated biphenyls throughout the marshlands that was the result of the chemical manufacturing process undertaken by Allied Signal and LCP between 1955 and 1979; EPA estimates that more than 380,000 pounds of mercury were "lost" in the area during this period. In addition to mercury and polychlorinated biphenyls, lead, other metals, and volatile organic compounds have contaminated the 500-acre marshlands area, a 1-mile portion of the Turtle River and the entirety of Purvis Creek. Mercury and polychlorinated biphenyls have been detected in aquatic life at levels sufficient to produce a ban on commercial fishing in these areas and a seafood consumption advisory for part of the river and all of the creek.

Cleanup Progress: Threat Mitigated by Physical Clean-up Work

Upon the plant's closing in February 1994, the State of Georgia asked EPA to take immediate action at the Site; EPA needed to address the threat of releases of chlorine gas and the flow of contamination into the adjacent saltwater tidal marsh containing endangered species.

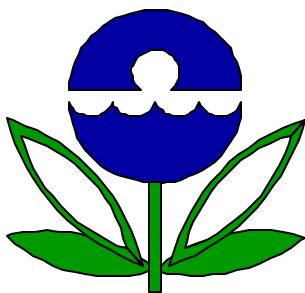
In 1994, EPA issued a Unilateral Administrative Order for Removal (UAO) to several of the former owner/operators of facility instructing them to undertake cleanup operations at the Site. In March 1995, the State of Georgia designated the LCP Site as the highest priority release Site in Georgia and requested that it be immediately placed by EPA on the Superfund National Priorities List; on June 17, 1996, the Site was finalized on the NPL. EPA has to-date recovered over 400,000 pounds of mercury, and overseen the treatment of over 55 million gallons of wastewater.

A removal action by EPA has excavated the vast majority of the on-site soils and waste piles. The Removal was completed Spring, 1999. Over 132,000 tons of Subtitle C RCRA Hazardous Waste and over 121,000 tons of Subtitle D soils and sediment have been removed from the LCP Chemicals site. Approximately 13 acres of marsh and marsh channels adjacent to the LCP site have been excavated.

The Superfund Remedial Program is assessing the need for further action at the Site. at a minimum, groundwater and biota monitoring will be necessary for many years. The Risk Assessment, Remedial Investigation, and Feasibility Study documents for the marsh/upland soil operable unit are under review. For the second operable unit concerning groundwater and the former cell building area, comments on the remaining RI/FS documents are under review. Further monitoring of the Site groundwater will be necessary since a very high pH (>13) exists, which seems to be dissolving sand in a localized area of the Site; however this high pH and highly contaminated groundwater plume seem to dissipate as it flows toward the marsh where the pH is buffered back to normal levels.

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Last updated on Wednesday, November 13th, 2002
URL: <http://www.epa.gov/region4/waste/npl/nplga/lcpincga.htm>



**U. S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL INVESTIGATION FACT SHEET**

LCP CHEMICALS, BRUNSWICK, GEORGIA

Region 4

June 2002

This is a short update on the status of the EPA work ongoing at the LCP Chemicals, Superfund site. This summary covers the status of the ongoing Remedial Investigation and Feasibility Study for the Upland soil and Groundwater operable units.

SITE HISTORY

Oil Refinery and Power Plant - The Atlantic Richfield Company (ARCO), a successor to the Atlantic Refining Company, operated the site as a petroleum refinery from 1919 to the early 1930's. The refinery was fueled by coal until 1922, after which oil was used as fuel. Refinery operations ceased by 1935. Georgia Power purchased portions of the site in 1937, 1942, and 1950. These purchases included two parcels of land and two 750 kilowatt electric generators from ARCO. Georgia Power subsequently added an additional 4.0 megawatts of electric generation capacity at the site. Bunker C oil was used as the fuel source in the on-site power plant.

Chemical (chlor-alkali) Plant - The Dixie Paint and Varnish Company operated a paint and varnish manufacturing facility at the site from 1941 to 1955 on a portion of the site property south of the Georgia Power parcel. Allied Signal operated a chlor-alkali facility at the site from 1955 to 1979, principally for the production of chlorine gas,

hydrogen gas, and caustic solution using the mercury cell process. This involved passing a concentrated brine solution between a stationary graphite or metal anode and a flowing mercury cathode to produce chlorine gas, sodium hydroxide (caustic) solution, and hydrogen gas, as a by-product. Sodium hypochlorite (bleach) was also produced in a secondary reaction.

LCP Chemicals - LCP purchased the property and plant in 1979. The chlor-alkali process continued with modification following the purchase. Part of the modification included the production of hydrochloric acid by reacting chlorine and hydrogen. Manufacturing operations continued until February 1994, when LCP notified site personnel that it would cease operation due to the revocation of the facility's water and air permits by the Georgia Environmental Protection Division (GA EPD).

Superfund Response Activity - In April 1994, EPA ordered the responsible parties to conduct a removal action at the Site. The removal cleanup for the upland soils was completed in July 1997. The removal action for the marsh area was completed in July 1999. During the removal action, more than 130,000 cubic yards of contaminated soil and sludge were removed from the upland soil area and 13 acres of contaminated sediment were excavated from the marsh. Contaminated soil, sludge and sediment were disposed in permitted landfills.

NPL Listing - The LCP site was proposed for listing on the National Priorities List (NPL) in October 1995. The site was finalized on the NPL in June 1996. The PRPs signed an Administrative Order on Consent in June 1995 to conduct the Remedial Investigation/Feasibility Study (RI/FS) for the Site. The RI/FS for upland soil and marsh areas was completed in March 2002. This study included evaluations of possible risk and measures to reduce risk.

OPERABLE UNIT 1 (OU) - UPLAND SOIL AND MARSH

The RI/FS is almost expected to be completed in September. The human health and ecological risk assessments are currently being reviewed. Although the RI/FS report has been completed, the PRP have submitted a draft FS addendum, at EPA's request, to present additional cleanup alternatives for the marsh. A copy of the draft FS addendum has been sent to the Glynn Environmental Coalition, the community group awarded the technical assistance grant (TAG) for this site.

EPA is in the process of coordinating the development of a proposed plan with GAEPD and other National Resource Trustees.

OPERABLE UNIT 2 - GROUNDWATER

The RI/FS is expected to be completed in September. The human health risk assessment has been submitted and is being considered for approval. At the request of EPA and GAEPD, the PRPs performed a supplemental RI field investigation in Fall 2001; results are provided in an RI Addendum report dated January 2002. EPA and GAEPD are coordinating the finalization of the RI report.

The PRPs will be collecting additional data from horizontal wells which were recently installed beneath an upper confining layer on site. Data from this sampling event will be included in a second RI Addendum scheduled to be submitted to EPA for review in June 2002. The FS report will follow in August.

WHAT TO EXPECT IN THE FUTURE

**Final RI/FS for Upland Soil
Final RI/FS for Groundwater
Public Availability Sessions
Proposed Plan Public Meetings**

If you would like to speak to EPA about issues related to the Site you may contact:

**Ken Lucas, Remedial Project Manager
U. S. EPA - REGION 4
61 Forsyth Street, SW
Atlanta, Georgia 30303**

Call toll free 1-800-435-9234

Definitions

Remedial Investigation/Feasibility Study:

After a site is listed on the NPL, a remedial investigation/feasibility study (RI/FS) is performed at the site. The RI serves as the mechanism for collecting data, while the FS is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions. The RI and FS are conducted concurrently. Data collected in the RI influence the development of remedial alternatives in the FS, which in turn affect the data needs and scope of treatability studies and additional field investigations.

Information Repository:

File set up near Superfund sites for the public which contain information and reference documents relevant to EPA activities.

National Priorities List (NPL):

EPA's list of priority hazardous waste sites that are eligible to receive federal money for response under Superfund.

Superfund:

The common name used for the Comprehensive Environmental Response, Compensation, and Liability Act, also referred to as the Trust Fund. The Superfund program was established to oversee the cleanup of hazardous waste sites.

Operable Unit:

An operable unit is a contaminated part of a site which may be addressed separate and apart from other portions of the site. An

operable unit can also be described as “a cleanup phase.”

Administrative Order on Consent:

A legal and enforceable agreement signed between EPA and Potentially Responsible Parties where by PRPs agree to perform or pay the cost of site investigation

Potentially Responsible Parties:

The Superfund law (CERCLA) allows EPA to respond to releases or threatened releases of hazardous substances into the environment. Under CERCLA, potentially responsible parties (PRPs) are expected to conduct or pay for the cleanup. The Superfund enforcement program identifies the PRPs at the site; negotiates with PRPs to do the cleanup; and recovers from PRPs the costs spent by EPA at Superfund cleanups.

Technical Assistance Grant :

A Technical Assistance Grant (TAG) provides money for activities that help communities participate in decision-making at eligible Superfund Sites. An initial grant up to \$50,000 is available for any Superfund site that is on the National Priorities List (NPL) or proposed for listing on the NPL and a response action has begun.

Record of Decision:

The Record of Decision (ROD) is a public document that explains which cleanup alternatives will be used to clean up a Superfund site. The ROD for sites listed on the NPL is created from information generated during the RI/FS.



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