

GENERAL SITE INFORMATION, CHARACTERISTICS, AND STATUS

Project Name	<u>LCP CHEMICALS</u>	ProjectID: 04-07
Last Updated:	04/10/01	
City:	Brunswick	
County:	Glynn	
State:	GA	
Country:	USA	
Bodies of Water:	Purvis Creek; Turtle River	
US EPA Region:	IV	
Status (Active, Complete, or Monitoring Only):	Complete	
Date On NPL:	1996	
ROD/ESD Date:	None	
Operable Unit:	OU-1	
Areas of Concern (length or acres):	Areas adjacent to the developed plant site contaminated with PCBs and mercury, including a 13-acre tidally-influenced marsh area and about one-half mile of an outfall channel and a separate natural drainage channel.	
Other Characteristics of Water Body:	The targeted 13-acre marsh area consisted of vegetated tidal flats and small drainage channels subjected to two tidal cycles per day, with the majority of the marsh inundated at high tide. Tidal water level differentials are about 8 feet.	
Contaminants of Concern:	PCBs (Aroclor 1268); mercury	
Source of Contamination:	<p>As described in References S-9 and B-206, the LCP Chemicals - Georgia Site is a former chemical manufacturing facility of about 550 acres, outside the northwest section of Brunswick, Georgia. The Site is currently bordered to the east by Ross Road, on the south by the Brunswick Pulp and Paper/Georgia - Pacific mill, and on the north and west by the Turtle River and associated creeks and marshes; the full Site area is located in the 100-year flood plain. About 500 of the Site's approximately 550 acres consist of marshland; the former manufacturing operations of LCP Chemicals - Georgia, Inc. were situated on the remaining 50 acres. The 50 acres that is not marshland has contained industry since at least the early 1920s when Atlantic Refining Company built an oil refinery at the Site. In 1937, 1942, and 1950, Georgia Power Company acquired portions of the Site property, including two parcels of land and two electric generators from Atlantic Refining Co.; Georgia Power Co. subsequently added additional electric generation capacity at the Site. From 1941 until 1955, the Dixie Paint and Varnish Co. manufactured paint on a portion of the Site - property to the south of the Georgia Power Co. parcel. Dixie Paint and Varnish Co. became the Dixie O'Brien Corporation and eventually a wholly owned subsidiary of The O'Brien Corporation. In the mid-1950s, after acquiring almost all the land constituting what is now known to be the Site, the Allied Chemical & Dye Corporation established and operated a chlor-alkali chemical manufacturing process (Solvay) at the Site (for the production of sodium carbonate from salt, ammonia, and carbon dioxide). This chlor-alkali process continued at the Site after the 1979 acquisition of the Site property from Allied-Signal, Inc. by the LCP Chemicals - Georgia, Inc., division of the Hanlin Group, Inc. which is the current owner of the site (with the exception of an approximately 2.9 acre parcel owned by Georgia Power Co.). The Hanlin Group, Inc. operated the chlor-alkali (Solvay) facility at the Site initially using the same manufacturing process and waste handling procedures that had previously been used at the Site by Allied-Signal, Inc. On July 10, 1991, Hanlin filed for Chapter 11 Bankruptcy. In February 1994, industrial production at the Site ceased just before EPA issued a Unilateral Administrative Order for Removal.</p>	

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Contaminated Area

Physical Characteristics:

Apparently as a result of these industrial processes, contamination at the LCP Site came to reside in four broad areas: (1) the production plant, (2) onsite disposal units, (3) contaminated soil in the upland areas of the site, and (4) water, sediments, and biota in drainage channels and in the salt marsh. The main contaminants are PCBs and mercury.

The LCP Site, on the northwest edge of Brunswick, GA, is about 550 acres, including about 50 acres of industrialized upland area and about 500 acres of estuary (marsh). Runoff from the Site flows into a drainage channel which flows through an area of wetlands and enters Purvis Creek. Purvis Creek merges with the Turtle River approximately one mile downstream and then with the Brunswick River an additional 7.5 miles downstream, which flows approximately 5 miles into the Atlantic Ocean.

In addition to the historical industries on the LCP Site, Reference A-326 reports other nearby facilities as follows:

"A Georgia-Pacific Corporation pulp and paper mill borders the LCP Site on the south side and discharges wastewater effluent to the Turtle River. The Brunswick Academy Creek Wastewater Treatment Plant is located farther to the south and discharges effluent to the Turtle River through Academy Creek and the East River. A Glynn County municipal landfill is also located on the edge of the marsh along the northern boundary of the LCP Site. In addition, numerous industrial facilities are located along the Turtle River estuary, both north and south of the LCP Site."

Reference A-326 further describes the targeted marsh area:

"Sediments are transported within the marsh environment by surface water flowing through the network of tidal channels. Sediment particles settle out and are deposited on the vegetated marsh surface and in tidal channels when current velocities are not strong enough to keep them suspended. The extensive marsh vegetation reduces current velocities and enhances deposition of suspended sediments. The marsh, therefore, is an effective trap for fine-grained sediments and constituents adhering to these sediments" (which are organic-rich silty clays).

According to Reference S-9, sediment samples in the targeted 13-acre marsh area exhibited PCB and mercury concentrations in excess of 1000 ppm. Reference A-326 identified mercury concentrations in the top 8 inches of sediment of 33-43 ppm in the targeted drainage channel, and PCB concentrations of 140-200 ppm.

Type of Regulatory Action:

Superfund. Time Critical Removal Action pursuant to an Agreement and AOC.

Overall Status Summary:

The LCP Chemicals Superfund Site near Brunswick, GA comprises about 500 acres of tidal marshland and 50 acres of industrialized upland area. An oil refinery, a paint manufacturing company, a power plant, and a chlor-alkali plant have all operated at the site over 70 years. The chlor-alkali plant ceased operations in February 1994. In April 1994, a Unilateral Administrative Order for Removal Response Activities at the LCP Site, issued by EPA Region IV, became effective calling for characterization and remediation of contaminated onsite soils, sediments, debris, surface waters, building structures, and accumulated wastewaters, and control, treatment, and disposal of elemental mercury and chlorine and associated residuals. In March 1995, Georgia designated the LCP Site as the highest priority release site in Georgia. In June 1996, the site was designated a Superfund Site. As of March 5, 1999, EPA and contractors had recovered about 400,000 pounds of mercury, treated about 55 million gallons of wastewater, and removed and disposed about 253,000 tons of RCRA Subtitle C and D wastes from the 50-acre developed portion of the site.

In an Agreement and Administrative Order on Consent for Removal Action, effective February

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4, 1998, EPA Region IV called for an additional removal action from 13-acres of tidal marsh containing the most elevated levels of PCBs (Aroclor 1268) and mercury and from about one-half mile of drainage channels which originate at the 50-acre developed site, flow through marshland, and ultimately flow into Purvis Creek, a tributary of the Turtle River. This removal action was implemented from January 5, 1998 to July 17, 1999. A total of 21,523 cy of sediment were removed by wet excavation from the 13-acres of marsh area. A total of 3,511 cy of sediment were removed from 2,650 feet of drainage channels using a combination of both wet excavation and a bucket ladder dredge on a barge. The marsh area was backfilled with 21,111 cy of sand, and replanted. The removed materials were dried using cement kiln dust and quick lime and were then trucked to commercial disposal facilities in Savannah, GA and Emelle, AL.

The Removal Action Agreement and AOC provided for cost sharing, whereby the PRPs implementing the Removal Action could submit a claim against the Superfund for an amount not to exceed the lesser of \$1.7 million or 34.5% of the estimated \$4.925 million implementation cost. No ROD has yet been issued for the site. EPA anticipates issuing a ROD for at least one of the OUs by September 2001.

Remedial Action Planned: ☒

Risk Assessment: ☒

Remedial Action Implemented: ☒

Status of Dredging ☐

PRPs: ☒

Contacts: ☒

References: ☒

Modeling: ☐

Fishing Advisory: ☒

Key Conditions: commercial landfill, habitat/streambank restoration, post monitoring, solidification / stabilization, specialty dredge, tidal fluctuations, wetlands

REMEDIAL ACTION PLANNED

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Target Sediment Cleanup Standards (TSCS):	None	
How TSCS Established:	N/A	
Target Bank and Floodplain Cleanup Levels (if applicable):	None	
Other Target:	Refer to "Stated Remedial Action Objectives (and Sources)," below	
Environmental Sample Data References:	<ul style="list-style-type: none">• Sediment: Reference A-448, Table 1• Water: Reference A-448, Table 1• Fish: Reference C-376	
Estimated Target Volume:	21,457 cy from the 13-acre marsh and 2,660 cy from the drainage channels	
Planned Disposal Method:	commercial landfill	
Estimated Calendar Time to Implement Remedy:		
Estimated Time to Implement Remedy:	6 months	
Estimated Cost to Implement Remedy:	\$4.925 million, per Appendix C of Reference S-9	
Stated Remedial Action Objectives (and Source):	<p>From Appendix B of Reference S-9: "Investigations at the LCP Site have demonstrated that a release of hazardous substances that pose an immediate threat to human health and welfare or the environment has occurred in the marsh/Purvis Creek/Turtle River system (hereafter known as the "marsh system"). Contaminants, chiefly lead, polychlorinated biphenyls (PCBs), and mercury (Hg), have entered the sediments, water, and biota of the marsh system. A further review by EPA of the data collected show that the vast majority of the mass of Contaminants of Concern (CoCs) in the marsh system are concentrated within the designated removal areas. Likewise, the concentrations of CoCs, and hence the threats they pose, appear to decline sharply outside of these areas."</p> <p>"The intent of this removal action is to address site constituents which may have migrated from the upland portion of the facility to the adjoining marsh. PCBs and mercury have been identified as the two principal constituents of concern in marsh sediment. Figures 2 and 3 demonstrate the predicted effectiveness of this removal action by depicting pre- and post-removal conditions for these two constituents within the marsh."</p>	
Measures of Success to be Used:	<p>From Appendix B of Reference S-9: "To confirm effectiveness, post-excavation sampling will be conducted in the 13-acre area and the two drainage ways. Approximately 25 samples of remaining sediments will be taken in the 13-acre area based on a random grid system. Confirmatory sediment samples will be taken along the length of the drainage ways at intervals of 100 feet."</p>	

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Planned Monitoring and Restoration:

Apparently in anticipation of a 10-year post-monitoring program, a monitoring study was conducted during the Summer of 1997, after upland removal actions were completed but prior to sediment remediation. The objectives and results are reported in Reference A-535) and are summarized below:

Objectives

"1) Examine the bioavailability of mercury, methylmercury, lead, and PCBs in transplanted oysters and in three resident species located near the LCP site relative to uptake at a reference location. Relationships among concentrations in sediment, surface water, and tissues will be examined to assess correlations among the matrices. Bioaccumulation in deployed and resident oysters will be compared to verify that deployed oysters are appropriate surrogates to evaluate bioavailability at the site."

"2) Provide a characterization in order to assess the success of the upcoming removal action to be taken in the marsh. A trend analysis will likely need to be conducted to determine if tissue concentrations are decreasing over time to acceptable concentrations."

"3) Determine the extent and magnitude of contamination remaining in the marsh after completion of removal actions in the upland portions of the site. Contamination gradients from the area previously identified as a major source of contamination will be examined."

Results

"The sampling in this study included the collection of sediment, water, fish (*Fundulus heteroclitus*), fiddler crabs (*Uca* spp.), resident oysters (*Crassostrea virginica*), and deployment of caged oysters for chemical analysis at the same stations along a gradient away from the area of known contamination at the site, and at three stations in tributaries in the marsh, and at two reference stations for comparison purposes."

"Conclusions include:

1) Mercury and Aroclor 1268 are bioavailable throughout the site and are present at elevated concentrations (relative to the reference area) in water, sediment and all three species of biota tested in this study. Biota concentrations correlate well with water and sediment concentrations indicating that water and suspended sediments may be a significant pathway for spreading mercury contamination throughout the site. Caged oysters appear to be reasonable surrogates for resident oysters."

"2) The analysis of contamination in sediment, water, *Fundulus*, fiddler crab, and oysters are effective measurements for monitoring contamination at the LCP site. These measurements should be repeated to document the success of removal actions at reducing exposure of contaminants to site biota."

"3) Considering the former outfall ditch as the primary source of contamination to water, sediment, and biota can adequately explain the observed patterns of contamination. Based on differences between creek bottom and creek bank sediment, it appears that methylation may be occurring at a greater rate on the marsh surface than in creek sediments."

Agency Position on Sediment Removal (and Source):

From Appendix B of Reference S-9: "The 1997 Evaluation Report made two crucial observations which largely controlled the removal options available. First, the test excavations showed that digging much past the root mat of the marsh grass would be difficult, if not impossible. The root

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mat typically extends between 12 to 18 inches below the marsh surface. Directly underlying the root mat is a layer of very loose silt. Digging into the silt zone caused the test pits to "liquify." This in turn made it difficult to maintain an even bottom, and allowed the sides of the test pits to sluff into the excavation. Under these conditions it would be difficult to excavate to a specific level within the silt. In addition, because of the instability of the sides it would be problematic to separate "cleaned grids" from "working grids" from "dirty grids." However, if the excavation depth was kept just below the root mat a stable excavation area could be maintained. The test excavations also indicated that it was not possible to do separate cuts within the vegetative matter. That is, a six inch or one foot cut could not be made if it did not reach below the root mat."

"The second crucial observation dealt with the vertical distribution of the contaminants. Within the evaluation area no PCBs were detected in any sample with a depth greater than one foot below the marsh surface. Mercury levels were similarly distributed, with more than 90% of the mass of mercury appearing to be within the top foot of the marsh. These observations were also noted in the two drainage channels slated for removal."

"The combined result of these observations compelled EPA to design the removal action to consist of the excavation of the root mat component of the marsh sediment (typically 12-18 inches) from the 13-acre area and two designated ditches. This will allow for a workable excavation, combined with the removal and off-site disposal of nearly all the CoCs in the immediate area."

Also, "A significant portion of the material to be removed from the 13-acre marsh area consists of marsh grass. Testing performed during the removal investigations indicated the absence of significant levels of site constituents in this grass. Accordingly, materials removed from the 13-acre portion of the removal action area will be processed to separate marsh grass from marsh sediments. Separated grass and roots will be washed to remove sediment from plant surfaces."

RISK ASSESSMENT

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RA Type: Human Health and Ecological

RA Status: Complete

RA Objectives: From Reference A-326 : "To present a more realistic characterization of baseline risk upon which to assess the need for response actions, both risk assessments were performed using a data base reflective of post-response action conditions."

***Company
Performing RA:*** Geraghty & Miller (human health); PTI Environmental Services and CDR Environmental Specialists (eco)

RA Reference Report: Reference A-326

***RA Summary and
Conclusions:*** From Reference A-326: "PTI and CDR (1997) performed an ecological risk assessment that evaluated a range of assessment endpoints. These endpoints include the following:

- The overall ecological health of the salt marsh community
- The long-term health and reproductive capacity of aquatic reptiles, omnivorous mammals, and birds
- The fishery
- The ecosystem's ability to function as a nursery
- Individual threatened or endangered species."

"This evaluation determined that following completion of the removal action there will be no significant unacceptable chronic risks attributable to the LCP Site for any of the assessment endpoints. Further, the planned removal action, in combination with completed removal actions, will serve to substantially reduce PCB and mercury input from the LCP Site to the food web, resulting in the reduction of estimated exposure to PCBs and mercury and a lowering with time of site-related associated body burdens for constituents of potential concern."

"Geraghty & Miller (1997) conducted a human health risk assessment evaluating the potential for current and future post-removal exposure to site-related constituents of potential concern for several scenarios, including contact with upland soils in hypothetical occupational, residential, and recreational scenarios and with constituents in marsh sediments and seafood in hypothetical recreational scenarios. Using conservative assumptions, this evaluation concluded that after the removal action is complete, no significant risk exists for human receptors at the LCP Site."

A laboratory study was performed in 1997-1998 (reported in Reference A-536) to "determine threshold tissue concentrations of mercury or Aroclor 1268 in adult *Fundulus heteroclitus* that are associated with any observed reductions in survival, growth, fecundity, or fertilization success. This objective was intended to determine whether adult fish exposed to mercury or PCBs in food under laboratory conditions can successfully reproduce. The approach was to collect fish from a clean reference area, feed them contaminated food under laboratory conditions, and compare their reproductive performance to control fish. The exposure method for this objective was intended to simulate natural conditions (accumulations through food) as much as possible given time constraints and laboratory conditions."

Specifically, the research was intended to determine whether:

- "1) fish that are exposed to mercury or Aroclor 1268 survive and successfully reproduce;
- 2) offspring of exposed fish hatch, survive, produce eggs and fertilize them; and

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3) whether the second generation offspring of exposed fish would hatch and survive."

"Fundulus heteroclitus were exposed to mercury or the PCB mixture Aroclor 1268 via contaminated food. Endpoints evaluated included survival, growth, fecundity, fertilization success, hatch success, larval survival, sex ratios, and the prevalence of gonadal or spinal abnormalities."

"In general, PCBs were highly bioavailable, and accumulated well through feeding. The only statistically significant effect observed as a result of treatment with Aroclor 1268 was an increase in growth in the offspring of exposed fish. It is not clear whether this is an adverse effect."

"Mercury was accumulated in a dose-dependent fashion via food exposures. Exposure to mercury increased mortality in male Fundulus (possibly as a result of behavioral alterations). Increased mortality was observed at body burdens between 0.2 and 0.47 ppm."

"Offspring of Fundulus fed mercury-contaminated food were less able to successfully reproduce, with reduced fertilization success observed between egg concentrations of 0.01 and 0.63 ppm (or when parent whole body concentrations were between 1.1 and 12 ppm). Offspring of exposed fish also had altered sex ratios with treatment at moderate concentrations producing fewer females and treatment at the highest concentration producing more females than expected. Alterations in sex ratios were observed at less than 0.01 ppm in eggs or between 0.44 and 1.1 ppm in parents. Offspring of mercury exposed fish also had increased growth in moderate treatments, when egg concentrations were less than 0.02 ppm, or when parent whole bodies contained between 0.2 and 0.47 ppm. However, it is not clear that this increase in growth was an adverse effect."

"In summary, mercury exposure reduced male survival, reduced the ability of offspring of exposed fish to successfully reproduce, and altered sex ratios. Both direct effects on exposed fish and transgenerational effects were observed."

"The overarching purpose of this research was to determine the potential for mercury or PCBs to disrupt reproduction and sexual differentiation in fish. It has been demonstrated that low levels of methylmercury accumulated in tissues may disrupt successful reproduction and sexual differentiation in Fundulus heteroclitus, which would have serious effects at the population level."

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Physical Target: 13 acres of tidal-influenced marsh and 2,650 linear feet of drainage channel.

Goals: Reduce PCB and mercury levels in fish and shellfish. Remove sediment from the marsh area to either a minimum 12 inch depth of cut or to a depth extending to the base of the native vegetative root mat. Remove sediment from four drainage channel segments: a 10-foot wide strip centered along the centerline (segment C1); three isolated hot spots (C2); and the entire channel width (C3 and C4).

Primary Contractor: OHM Remediation Services

Other Contractors: JSS Specialty Engineering; GeoSyntec Consultants

Generic Remediation Method: Wet excavation; Bucket ladder Dredge

Equipment: Excavation of the 13-acre Marsh Removal Area involved the use of two approaches: (a) a long reach hydraulic excavator mounted on pontoon tracks - Ultra Low Ground Pressure marsh buggy; and (b) long reach hydraulic excavators. Excavation of sediment within the drainage channels involved the use of three removal approaches: (a) long reach hydraulic excavators; (b) a custom built bucket ladder barge with concrete pump; and (c) a long reach hydraulic excavator mounted on pontoon tracks (marsh buggy).

A PVC sheetpile dike, 1,632 linear feet, was constructed along the exposed western perimeter of the Marsh Removal Area to facilitate interior dewatering and to prevent release of contaminated sediments.

Material Handling: In the Marsh Area, modified Terex articulated off-road dump trucks (capacity 5 cy) were utilized to transport the excavated material to the Waste Processing Area, and later, to a designated drying bed, for offloading. Material processing was performed using a front-end loader and various hydraulic excavators. Material handling and load-out were performed using a hydraulic excavator.

Diesel-and gasoline-powered pumps were utilized to attempt to remove free-liquid from the marsh excavation, drying bed, and waste processing areas. A bulk tank, silo structure, and temporary shelters were used to store the cement kiln dust and quick lime reagent material which were utilized to stabilize the excavated material.

As described in Reference A-448: "The marsh excavation started in the southeast corner of the Marsh Removal Area and progressed west and north. The initial areas excavated were located along the alignment of access roads to be constructed into the marsh. The access roads ranged between approximately 15 to 30 feet wide and were spaced approximately every 50 to 75 feet through the Marsh Removal Areas."

"Generally, the marsh was excavated sequentially by material management zones. Initially, portions of a non-hazardous waste zone were excavated. To access the northern portion of the non-hazardous waste zone, access roads were constructed through the hazardous waste and transition zones. During construction of these access roads, hazardous and transition material was temporarily placed to the side of the road alignment. Subsequently the transition zone was excavated, stockpiled, and sampled to determine proper disposal of the material. Next, the hazardous waste zone was excavated followed by the north end of the non-hazardous waste zone, which was the final marsh area to be excavated."

"The access roads were constructed with a layer of polypropylene biaxial geogrid placed over the marsh sediment for structural support followed by the placement of borrow fill. The access roads

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also served as berms to isolate areas for dewatering. Once the access roads were constructed in a section of the marsh, the intermediate areas were excavated using the roads for access."

For the drainage channel segments, Reference A-448 describes the removal process as follows: "The sections of channel segment C3 accessible from a causeway were excavated first utilizing the long reach hydraulic excavators. Excavation was performed at low tide when the majority of the channel sediment was visible. An initial cut was made down the center of the channel in order for the equipment operator to excavate the banks with little to no water. This aided the equipment operator in evaluating the depth of removal. Excavation proceeded until the water level covered the entire cross-section of the channel, which hampered the excavation. The excavated material was loaded into Terex off-road dump trucks, which transported the material to the processing area. Less than five cubic yards could be transported at one time due to the watery consistency of the excavated material."

"The bucket ladder dredge was initially utilized to excavate sediment in channels not accessible from the causeway. The bucket ladder dredge consisted of numerous buckets attached to a chain drive mounted on the front of the barge. The bucket ladder could be raised and lowered and was capable of making sweeping motions across the channel. Once engaged, the buckets were lowered into the sediment and transferred the material to the concrete pump hopper located in the barge. Water was added to the hopper as necessary to produce a pumpable slurry. Once the hopper was filled, the concrete pump was engaged and the material was pumped through an HDPE discharge pipe to a truck loading station on the causeway. Although able to remove sediment, this operation was extremely slow and required several modifications due to mechanical problems. The window of operation for this method was also dictated by the tides. The dredge could only be utilized when sufficient water was present to float the barge and only as long as the bucket ladder could extend to the proper depth."

"The marsh buggy was incorporated to expedite the removal of sediment from channel segments C3 and C4. The marsh buggy operation consisted of the marsh buggy, and a separate barge containing a concrete pump. The marsh buggy operation commenced at the north end of channel segment C4 and proceeded southward to the limit of excavation. Excavation utilizing the marsh buggy was performed in a similar manner as the long reach excavators from the causeway. Excavation commenced once the water flow receded to the point where the channel banks were exposed. The excavation sequence was timed around the low tides. The main objective was to excavate when the channel sediment was exposed or with the least amount of water. The excavated material was placed in the concrete pump hopper a little at a time to prevent clogging of the screen on the hopper. A pump was utilized to add enough water to the material to produce a pumpable slurry. The pump was engaged and the material was pumped to a transfer station located on one of the earthen access roads. Conventional excavation and transport equipment was utilized to transfer the material to the processing area."

Since the majority of the channel excavation was inaccessible from an upland area, a combination of conveyance methods was use, i.e., "A conveyance system comprising a concrete pump and 6" HDPE discharge pipe was utilized. The maximum pumping distance for the concrete pump was approximately 600 feet. This distance was not always adequate to convey the dredged material from the active removal area directly to the waste processing area. Transfer stations were constructed at strategic locations to maximize the use of the pumping system. Dredged material pumped to the transfer locations was either loaded directly into a Terex truck or discharged into a 40 cy sealed roll-off."

According to Reference A-448, the average quantity of material excavated from the marsh area per

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	day was 145 cy based on 132 actual excavation days. The average quantity of material dredged or wet excavated per day from the drainage channel was 30 cy based on 118 actual removal days at about 2.7 hours per day.	
Volume Removed:	Marsh Area: 21,523 cy; Drainage Channels: 3,511 cy	
Calendar Time:	Jan. 5, 1998 to July 17, 1999	
Time To Implement:	Marsh Area Removal, 8.2 months (Mar. 9 - Nov. 18, 1998); Drainage Channel Removal, 11 months (June 12, 1998 to May 5, 1999)	
Total Cost:	About \$10 million	
Dredging Cost:	Not Identified	
Disposal of Sediment:	38,295 tons disposed, via truck, to two commercial landfills; 25,529 tons went non-hazardous to Savannah, GA; 13,396 tons went to the TSCA/Subtitle C hazardous waste facility in Emelle, AL. The total tonnage includes 3,427 tons of cement kiln dust and quick lime used at the Site as drying agents.	
Volume of Water:	Not Identified	
Method of Water Treatment:	Wastewater Processing Area. Components not identified.	
Water Discharge Limit:	Not Identified	
Air Monitoring During Remediation:	Not Identified	
Water Monitoring During Remediation:	<p>To mitigate resuspension and release of contaminated sediments during the drainage channel remediation, several control methods were used as follows according to Reference A-448:</p> <p>"Excavation at or near low tide reduced the resuspension of sediment. Excavation normally ceased when the water level in the channels rose above the elevation of the vegetated banks. Two turbidity curtains were installed in the channels to knock down sediment moving towards Purvis Creek."</p> <p>"To monitor the effectiveness of the turbidity control methods, water samples were collected routinely in the outfall ditch at four water quality monitoring stations. The quality of water flowing out into Purvis Creek was monitored by turbidity measurements and mercury and PCB analyses. Water samples were collected approximately every hour during ebb tides as part of the monitoring plan. The analytical results from these samples are presented as Table 2" (in Reference A-448).</p> <p>NOTE: Table 2 shows numerous positive results for PCBs and mercury in water at three monitoring stations. Reference A-448 does not attempt to put these results in context and not enough information is presented in Reference A-448 to allow an understanding of the significance of these results. Of 588 water samples collected from three monitoring stations over the period March 2, 1998 to April 30, 1999, 357 were ND for PCBs and 231 were positive for PCBs with results ranging from 0.5 to 20 ppb; for total mercury, of 770 water samples collected over the same period, 443 were ND for mercury and 307 were positive for mercury with results ranging from 0.2 to 152 ppb.</p>	
Outcome:	A total of 25,034 cy of sediment were removed from a 13-acre tidal marsh and 2,650 linear feet of drainage channels. After removal, the 13-acre marsh area was backfilled to a depth of 6-12 inches with 21,111 cy of porous well-graded sand from offsite sources. After backfilling, 13 confirmation	

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samples of sediment were collected in the marsh area. The samples were of the top 6 inches of sediment below the backfill. The 13 samples exhibited non-detectable PCBs (< 0.1 ppm) and barely detectable total mercury (1.6 ppm max.). A total of 88 final confirmation samples were collected from the 2,650 linear feet of drainage channel, as removal operations proceeded. Each sample was a three-part composite of the top 6 inches of sediment, collected from a transect across the width of the channel. Transects were spaced about 50 feet apart while moving downstream. The 88 final samples exhibited PCBs ranging from ND to 44 ppm and total mercury ranging from ND to 119 ppm. Median values for the 88 samples were 6 ppm PCBs and 8.4 ppm total mercury.

Restoration and Post-Monitoring:

After backfilling, marsh restoration included regrading and re-vegetation. Regrading was performed by hydraulic excavators, periodically aided with the use of laser leveling and alignment equipment. According to Reference A-448: "Re-vegetation was performed by a re-vegetation subcontractor using spartina alternifolia sprigs. Spartina alternifolia sprigs were obtained from (a) an approved off-site source and (b) an on-site location. Initially, plants were imported to the site from an off-site source. The source was pre-approved after TAL/TCL testing was conducted to ensure the plants were not obtained from a contaminated site. Additionally, plants were harvested at on-site locations north of and adjacent to a causeway in the existing marsh area. Approximately 60,000 sprigs were planted as part of the marsh restoration activities. Marsh re-vegetation was completed on July 7, 1999. The restoration will be re-evaluated after ten weeks from the end of the re-vegetation period. The contractor is obligated to re-vegetate (i.e., re-sprig) all marsh areas where significant die-off is observed. A marsh vegetation die-off site evaluation is pending as part of the post removal site control being conducted by NOAA."

EPA anticipates ten years of biota monitoring (Reference B-205). Details are expected to be provided in the ROD, due in September 2001.

Site-Specific Difficulties:

Accessibility constraints, tidal fluctuations, and equipment malfunctions were some of the site-specific difficulties encountered. These included difficulties already noted under "Material Handling" as well as the following (described in Reference A-448):

"The PVC perimeter sheetpile dike and earthen access roads were constructed and maintained at approximately elevation 7.5 feet., to attempt to protect and segregate portions of the Marsh Removal Area from tidal inundation during high tidal cycles. Protection by the sheetpile dike was limited to the lower tidal cycles. The wall was observed to experience severe deformation at high tidal cycles. Nonetheless, subsequent water sample data indicate that mercury and PCBs, which were sediment bound, were contained inside the sheetpile wall."

"Not all of the PVC sheetpile panels were driven to the desired penetration depth. Combined with the extremely low to non-existent shear strengths of the marsh sediment, the sheetpile dike experienced extreme deformations during the loading of the dike with each flow tide. The cyclical loading of the sheetpile dike by the flow tides also created problems with the integrity of the dike. Shoring of the dike was necessary in several locations."

"The channel sediment consisted mostly of clayey silt with an extremely high moisture content. This material was extremely sensitive and was prone to liquification when disturbed. Several sections of the outfall channel contained debris consisting of brick, wood, concrete debris, and graphite debris. Sand bars, oyster beds, and areas containing marsh grass were also encountered."

"To mitigate the release of potentially contaminated sediment during the dredging operation, two silt/turbidity curtains were installed in the outfall channel prior to initiation of removal activities. An attempt was made to construct a sediment trap across the channel using PVC sheetpiles and concrete debris riprap but the velocity of flow within the channel was too great."

REMEDIAL ACTION IMPLEMENTED

Project Name: LCP CHEMICALS

ProjectID: 04-07

Last Updated: 04/10/01

"Due to the extremely high moisture content of the excavated material, processing of the material was required to produce a material which would meet disposal criteria (i.e., contain no free liquids and pass the paint filter liquids test ASTM 9095). Several bench scale treatability tests were performed to evaluate reagents and additive rates to produce a material acceptable for transport to off-site disposal facilities. Initially, cement kiln dust (CKD) was chosen as the reagent. Stabilization with CKD was not entirely successful and eventually quick lime was utilized as the stabilizing reagent. The quick lime was more effective at drying the material and required smaller additive rates. Additional bench scale tests showed that an initial drainage step in the processing procedure facilitated the drainage of free water, which required a smaller percentage of quick lime for stabilization. For the material processing operation, approximately 15 to 30% of CKD was necessary while 7 to 15% of quick lime was used."

Monitoring Data

References:

- **Sediment**
- **Water:**
- **Fish:**

POTENTIALLY RESPONSIBLE PARTIES

Project Name **LCP CHEMICALS**

ProjectID: 04-07

PRP Name: PRP INFORMATION NOT RELEASED

PRPID:

Street Address:

City:

State:

KEY CONTACTS

Project Name **LCP CHEMICALS**

ProjectID: 04-07

Last Name: KEY CONTACT INFORMATION NOT RELEASED

Contact ID:

First Name:

Title:

Company:

Address:

City:

State:

Postal Code:

Work Phone # :

Other Phone #:

Fax # :

Email Address:

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: A

ReferenceID: 326

Title: *Feasibility Study for the Marsh (Estuarine) Area of the Operable Unit 1 of the LCP Site in Brunswick, Georgia*

Location: AEM

Category: RI/FS

Prepared by/Author: PTI Environmental Services

Preparer/Author Address: 15375 SE 30th Place, Suite 250
Bellevue, WA 98007

Prepared For: AlliedSignal, Inc.

Date Published: June 1997

Key Words and Phrases:

Reference Type: A

ReferenceID: 448

Title: *Close-Out Report: Marsh and Railroad Area Removal: Revision 0: LCP Chemicals - Georgia: Brunswick, Georgia*

Location: AEM

Category: Close-Out Report

Prepared by/Author: GeoSyntec Consultants

Preparer/Author Address: 1100 Lake Hearn Drive, NE, Suite 200
Atlanta, GA 30342

Prepared For: LCP Site Steering Committee
LCP Chemicals
65 Ross Road
Brunswick, GA 31520

Date Published: October 1999

Key Words and Phrases:

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: A

ReferenceID: 459

Title: ***LCP Chemicals Site: Removal Site Administrative Record:
Index, Volume 1***

Location: AEM

Category: Miscellaneous

Prepared by/Author: Lambat-Anderson, Inc.

**Preparer/Author
Address:** 2200 Clarendon Boulevard, Suite 900
Arlington, VA 22201

Prepared For: US EPA, Region IV, Waste Management Division

Date Published: August 14, 1995

**Key Words and
Phrases:**

Reference Type: A

ReferenceID: 535

Title: ***LCP Chemical Site: Monitoring Study Data Report***

Location: AEM

Category: Monitoring Plan/Report

Prepared by/Author: (1) Mary Baker Matta, (2) Sandra Salazar, (3) Lisa Mill, (4) Garrett Gray, (5) Jo Linse', (6) Paul Peronard, and (7) Leo Francendese

**Preparer/Author
Address:** (1) National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Coastal Protection and Restoration Division
7600 Sand Point Way NE
Seattle, WA 98155
(6, 7) US EPA Region IV
Waste Management Division
Emergency Response and Removal Branch
61 Forsyth Street
Atlanta, GA 30303
(2, 3, 4, 5) EVS Environmental Consultants, Inc.
200 West Mercer Street, Suite 403
Seattle, WA 98119

Prepared For: US EPA Region IV and NOAA

Date Published: August 25, 1998

**Key Words and
Phrases:**

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: A

ReferenceID: 536

Title: *Early Life Stage and Trans-generational Effects of Aroclor 1268 and Mercury on Fish: The LCP Chemical Site Final Report*

Location: AEM

Category: Risk Assessment

Prepared by/Author: (1) Mary Baker Matta, (2) Jo Linse', (3) Charles Cairncross, and (4) Leo Francendese

Preparer/Author Address: (1, 2, 3) National Oceanic and Atmospheric Administration
National Ocean Service

Office of Response and Restoration
Coastal Protection and Restoration Division
7600 Sand Point Way NE
Seattle, WA 98155

(4) US EPA Region IV
Waste Management Division
Emergency Response and Removal Branch
61 Forsyth Street
Atlanta, GA 30303

Prepared For: EPA Region IV

Date Published: September 17, 1999

Key Words and Phrases:

Reference Type: A

ReferenceID: 744

Title: *Administrative Record Index for the LCP Chemicals Georgia Inc Removal Site*

Location: AEM

Category: Miscellaneous

Prepared by/Author: US EPA Region IV

Preparer/Author Address: Atlanta, GA

Prepared For: General Public

Date Published: May 19, 1999

Key Words and Phrases:

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: A

ReferenceID: 935

Title: *LCP Chemical Site Monitoring Study. Data Report (CD-ROM)*

Location: AEM

Category: Monitoring Plan/Report

Prepared by/Author: (1) Mary Baker Matta, (2) Sandra Salazar, (3) Lisa Mill, (4) Garrett Gray, (5) Jo Linse', (6) Paul Peronard, and (7) Leo Francendese

Preparer/Author Address: (1) National Oceanic and Atmospheric Administration
National Ocean Service

Office of Response and Restoration
Coastal Protection and Restoration Division
7600 Sand Point Way NE
Seattle, WA 98155

(6, 7) US EPA Region IV
Waste Management Division
Emergency Response and Removal Branch
61 Forsyth Street
Atlanta, GA 30303

(2, 3, 4, 5) EVS Environmental Consultants, Inc.
200 West Mercer Street, Suite 403
Seattle, WA 98119

Prepared For: US EPA Region IV and NOAA

Date Published: August 25, 1998

Key Words and Phrases:

Reference Type: B

ReferenceID: 168

Title: *U.S. Environmental Protection Agency Pollution Report (POLREP # 133)*

Location: AEM

Category: Site Update

Prepared by/Author: Paul Peronard and Leo Francendese, OSCs

Preparer/Author Address: US EPA Region IV

Prepared For: US EPA Region IV

Date Published: May 22, 1997

Key Words and Phrases:

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: B

ReferenceID: 204

Title: *Environmental Protection Agency - Region 4: Fiscal Year 1998: Enforcement & Compliance Assurance Accomplishments Report (selected pages on LCP Chemicals)*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region IV

**Preparer/Author
Address:**

Prepared For:

Date Published: 1999 circa

**Key Words and
Phrases:**

Reference Type: B

ReferenceID: 205

Title: *LCP Chemicals Georgia, Inc. Removal (Summary)*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region IV

**Preparer/Author
Address:**

Prepared For: Web Site

Date Published: March 5, 1999 (circa)

**Key Words and
Phrases:**

Reference Type: B

ReferenceID: 206

Title: *LCP Site, Brunswick, GA -- Congressional District 1 (Summary)*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region IV

**Preparer/Author
Address:**

Prepared For: Web Site

Date Published: June 17, 1999

**Key Words and
Phrases:**

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: B

ReferenceID: 372

Title: *Mercury and PCBs from LCP Site Contaminate Waterways:
Residents Warned not to Eat Fish*

Location: AEM

Category: Fish/Biota

Prepared by/Author: ATSDR

**Preparer/Author
Address:**

Prepared For: General Public -
Hazard Substances and Public Health (ATSDR), Vol. 5, No. 2

Date Published: 1995 Spring

**Key Words and
Phrases:**

Reference Type: B

ReferenceID: 657

Title: *NOAA Sampling Plan for LCP Waste Site*

Location: AEM

Category: Monitoring Plan/Report

Prepared by/Author: Unknown

**Preparer/Author
Address:**

Prepared For: Unknown

Date Published: 1995 circa

**Key Words and
Phrases:**

Reference Type: B

ReferenceID: 658

Title: *Memo re: Loss of Mercury in Hydrogen*

Location: AEM

Category: Miscellaneous

Prepared by/Author: D.J. Saunders

**Preparer/Author
Address:** Industrial Chemicals Division

Prepared For: Distribution

Date Published: December 7, 1973

**Key Words and
Phrases:**

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: B
Title: *Memo re: Acme Plant Cell Circulating Mercury*
Location: AEM
Category: Miscellaneous
Prepared by/Author: Bruce T. Smith
Preparer/Author Address: LCP Chemicals & Plastics, Inc.
Prepared For: Herman Sears
Date Published: March 29, 1984
Key Words and Phrases:

ReferenceID: 659

Reference Type: B
Title: *Memo re: Results of Analyses of Seafood from Turtle River and Purvis Creek*
Location: AEM
Category: Fish/Biota
Prepared by/Author: Marshall Gaddis
Preparer/Author Address: Georgia Department of Natural Resources
205 Butler Street S.E.
East Floyd Tower
Atlanta, GA 30334
Prepared For: Randy Manning
Date Published: September 22, 1992
Key Words and Phrases:

ReferenceID: 660

Reference Type: B
Title: *Memo re: Investigatory Monitoring of Contaminants in Fish and Wildlife, St. Simons Estuary, Georgia*
Location: AEM
Category: Fish/Biota
Prepared by/Author: Ed EuDaly
Preparer/Author Address: RCRA Specialist
ES
Brunswick, GA
Prepared For: Patuxent Wildlife Research Center (Laurel, MD)
Date Published: August 14, 1984
Key Words and Phrases:

ReferenceID: 661

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: B

ReferenceID: 662

Title: *Memo re: LCP, Brunswick
Oyster and Crab Tissue Data for Mercury and PCBs
Toxic Substances Stream Monitoring Project*

Location: AEM

Category: Fish/Biota

Prepared by/Author: William Kennedy

**Preparer/Author
Address:** Georgia Department of Natural Resouce
205 Butler Street, S.E.
Floyd Towers East
Atlanta, GA 30334

Prepared For: Distribution

Date Published: February 28, 1992

**Key Words and
Phrases:**

Reference Type: B

ReferenceID: 663

Title: *Memo re: Closure of Purvis Creek and Portions of Gibson Creek
and Turtle River to Commercial Fishing*

Location: AEM

Category: Fish/Biota

Prepared by/Author: Susan Shipman and Jim Music

**Preparer/Author
Address:** Georgia Department of Natural Resources
One Conservation Way
Brunswick, GA 31523-8600

Prepared For: Duane Harris

Date Published: March 17, 1992

**Key Words and
Phrases:**

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: C

ReferenceID: 198

Title: *LCP removal work needed in Georgia*

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author

Address:

Prepared For: Superfund Week

Date Published: November 10, 1995

**Key Words and
Phrases:**

Reference Type: C

ReferenceID: 200

Title: *PRPs to bid sediment fix at LCP in GA*

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author

Address:

Prepared For: Superfund Week

Date Published: March 21, 1997

**Key Words and
Phrases:**

Reference Type: C

ReferenceID: 338

Title: *Sediment Removal Wrapping Up at LCP; EPA Expects Proposed Plan by Winter*

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author

Address:

Prepared For: Superfund Week

Date Published: October 9, 1998

**Key Words and
Phrases:**

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: C

ReferenceID: 350

Title: *Distribution and Characterization of Polychlorinated Biphenyl Congeners in Soil and Sediments from a Superfund Site Contaminated with Aroclor 1268 (LCP Chemicals)*

Location: AEM

Category: Contaminated Sediments: Characteristics/Bioavailability

Prepared by/Author: (1) Kurunthachalam Kannan (2) Keith A. Maruya and (3) Shinsuke Tanabe

Preparer/Author Address: (1 and 2) Skidaway Institute of Oceanography,
10 Ocean Science Circle,
Savannah, GA 31411
(3) Department of Environment Conservation
Ehime University,
Tarumi 3-5-7,
Matsuyama 790, Japan

Prepared For: Environmental Science & Technology, 1996, Vol. 31, No. 5, pp 1483 - 1488

Date Published: 1997

Key Words and Phrases:

Reference Type: C

ReferenceID: 376

Title: *Aroclor 1268 and Toxaphene in Fish from a Southeastern U.S. Estuary (LCP Chemicals)*

Location: AEM

Category: Fish/Biota

Prepared by/Author: Keith A. Maruya and Richard F. Lee

Preparer/Author Address: Skidaway Institute of Oceanography
10 Ocean Science Circle
Savannah, GA 31411

Prepared For: Environmental Science & Technology, 1998, Vol. 32, No. 8, pp 1069-1075

Date Published: 1998

Key Words and Phrases:

REFERENCES

Project Name **LCP CHEMICALS**

ProjectID: 04-07

Reference Type: C
Title: ***LCP ecological studies near***
Location: AEM
Category: Site Update
Prepared by/Author:
Preparer/Author
Address:
Prepared For: Superfund Week
Date Published: June 14, 1996
Key Words and
Phrases:

ReferenceID: 422

Reference Type: C
Title: ***Primary PRPs Get Long Prison Terms For Crimes Leading to \$50M Removal***
Location: AEM
Category: Site Update
Prepared by/Author:
Preparer/Author
Address:
Prepared For: Superfund Week
Date Published: June 18, 1999
Key Words and
Phrases:

ReferenceID: 482

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: C

ReferenceID: 802

Title: *Mercury Exposure in Chloralkali Plants*

Location: AEM

Category: Risk Assessment

Prepared by/Author: (1) William B. Bunn III, (2) Charles M. McGill, (3) Tracy E. Barber, (4) John W. Cromer, Jr., (5) Leonard J. Goldwater

Preparer/Author Address: (1, 3, 4, 5) Occupational Medicine Program
Department of Community and Family Medicine
Box 2914
Duke University Medical Center
Durham, NC 27710
(2) 10124 36th Street N.W.
Gig Harbor, WA 98335

Prepared For: American Industrial Hygiene Association Journal, 47 (51: 249-254)

Date Published: 1986

Key Words and Phrases:

Reference Type: C

ReferenceID: 803

Title: *Correction of Urinary Mercury Concentration by Specific Gravity, Osmolality, and Creatinine*

Location: AEM

Category: Analytical Protocol/Issues/QAPP

Prepared by/Author: (1) T.E. Barber, MD, (2) G.Wallis, Ph.D

Preparer/Author Address: (1) 3009 Lookout Ct
Winston-Salem, NC 27106
(2) Laboratory for Physical Science
Duracell International, Inc.

Prepared For: Journal of Occupational Medicine, Vol. 28, No. 5

Date Published: May 1986

Key Words and Phrases:

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: C

ReferenceID: 902

Title: *GA.: Work on OUs Nears Completion*

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author

Address:

Prepared For: Hazardous Waste/Superfund Week

Date Published: July 1, 2002

**Key Words and
Phrases:**

Reference Type: D

ReferenceID: 32

Title: *Mercury totals 9,000 pounds at LCP plant*

Location: AEM

Category: Site Update

Prepared by/Author: Terry Diskson

Preparer/Author

Address:

Prepared For: The Georgia Times-Union

Date Published: 1996 circa

**Key Words and
Phrases:**

Reference Type: D

ReferenceID: 33

Title: *Safety violations force halt to toxic waste cleanup (LCP
Chemicals-Georgia, Inc., Brunswick, GA)*

Location: AEM

Category: Site Update

Prepared by/Author: Scott Branstein

Preparer/Author

Address:

Prepared For: The Atlanta (GA) Journal / The Atlanta (GA) Constitution

Date Published: February 11, 1995

**Key Words and
Phrases:**

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: D

ReferenceID: 34

Title: *Pollution out of control (LCP Chemicals-Georgia, Inc., Brunswick, GA)*

Location: AEM

Category: Site Update

Prepared by/Author:

**Preparer/Author
Address:**

Prepared For: The Atlanta (GA) Constitution

Date Published: December 3, 1993

**Key Words and
Phrases:**

Reference Type: D

ReferenceID: 348

Title: *Warning about fish - LCP plant draws more EPA concern*

Location: AEM

Category: Fish/Biota

Prepared by/Author: Mr. Dickson

**Preparer/Author
Address:**

Prepared For: The Georgia Times-Union

Date Published: March 1, 1995

**Key Words and
Phrases:**

Reference Type: D

ReferenceID: 349

Title: *Feds decide Brunswick marsh site 'terrible' for storing toxic waste*

Location: AEM

Category: Site Update

Prepared by/Author: Associated Press

**Preparer/Author
Address:**

Prepared For: The Atlanta (GA) Journal / The Atlanta (GA) Constitution

Date Published: March 23, 1995

**Key Words and
Phrases:**

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: F

ReferenceID: 7

Title: *Solvay Process (2 pages from Hawley's Condensed Chemical Dictionary)*

Location: AEM

Category: Miscellaneous

Prepared by/Author: Hawley's Condensed Chemical Dictionary

**Preparer/Author
Address:**

Prepared For:

Date Published:

**Key Words and
Phrases:**

Reference Type: G

ReferenceID: 59

Title: *Selecting the best risk management option: A natural resource trustee perspective
(for complete presentation see Reference G-41)*

Location: AEM

Category: Contaminated Sediments: Management Issues

Prepared by/Author: (1) Mary Baker Matta, (2) Don MacDonald, (3) Ron Gouguet, (4) Ken Finkelstein

**Preparer/Author
Address:** (1), (2), (3), (4) NOAA
office of Response and Restoration

Prepared For: EPA Forum on Managing Contaminated Sediments at Hazardous Waste Sites

Date Published: May 30 - June 1, 2001

**Key Words and
Phrases:**

Reference Type: J

ReferenceID: 17

Title: *EPA National Priorities List - LCP Chemicals*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region IV

**Preparer/Author
Address:**

Prepared For: Website

Date Published: June 1996

**Key Words and
Phrases:**

REFERENCES

Project Name **LCP CHEMICALS**

ProjectID: 04-07

Reference Type: L

ReferenceID: 40

Title: **Memo re: Status of LCP Chemical NPL Site**

Location: AEM

Category: Site Update

Prepared by/Author: AEM, Inc.

Preparer/Author Address: Malvern, PA 19355

Prepared For: Distribution

Date Published: August 13, 1999

Key Words and Phrases:

Reference Type: L

ReferenceID: 61

Title: **Site Histories Re: Calcasieu River, LA; Calcasieu Estuary, LA; LCP Chemical, VA; Strandley/Manning, WA**

Location: AEM

Category: Site Update

Prepared by/Author: AEM, Inc.

Preparer/Author Address: Malvern, PA 19355

Prepared For: Distribution

Date Published: August 13, 1999

Key Words and Phrases:

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: M

ReferenceID: 166

Title: *Congener-specific PCB analysis of soils and sediments from a Superfund Site contaminated with Aroclor 1268 (LCP Chemicals)*

Location: AEM

Category: Contaminated Sediments: Investigation/Delineation

Prepared by/Author: (1) K.A. Maruya, (2) K. Kannan, (3) R.F. Lee, and (4) S. Tanabe

Preparer/Author Address: (1, 2, 3) Skidaway Institute of Oceanography
10 Ocean Science Circle
Savannah, GA 31411
(4) Department of Environmental Conservation
Ehime University
Matsuyama, Japan

Prepared For: Unknown

Date Published: February 1997

Key Words and Phrases:

Reference Type: M

ReferenceID: 190

Title: *NOAAs concerns regarding PCB contaminated sediments*

Location: AEM

Category: Site Update

Prepared by/Author: Mary Matta

Preparer/Author Address: National Oceanic and Atmospheric Administration

Prepared For: NAS Committee on Remediation of PCB Contaminated Sediments

Date Published: June 18, 1999

Key Words and Phrases: LCP Chemicals; Strandley-Manning; PPG Site (Calcasieu, LA)

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: M

ReferenceID: 358

Title: *NOAA's Preliminary Natural Resource Survey (PNRS) for LCP Chemicals, Inc. Site (and transmittal letter)*

Location: AEM

Category: Fish/Biota

Prepared by/Author: Alyce T. Fritz, Chief, Coastal Resource Coordination Branch

Preparer/Author Address: U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Oceanography and Marine Assessment
Ocean Assessments Division
Hazardous Materials Response Branch
7600 Sand Point Way N.E. - Bin C15700
Seattle, WA 98115

Prepared For: Rosemary Patton, US EPA Region IV

Date Published: February 9, 1995

Key Words and Phrases:

Reference Type: M

ReferenceID: 359

Title: *Consumption of Seafood and Wild Game Contaminated with Mercury, Brunswick, Glynn County, Georgia (PB99156259)*

Location: AEM

Category: Fish/Biota

Prepared by/Author: Glynn County Health Department, Hazardous Waste Program

Preparer/Author Address: Brunswick, GA

Prepared For: General Public

Date Published: July 1999

Key Words and Phrases:

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: M

ReferenceID: 360

Title: *Letter transmitting "St. Simons Study" report (prepared by US Fish and Wildlife Service)*

Location: AEM

Category: Fish/Biota

Prepared by/Author: Bill Mundy

Preparer/Author Address: Georgia Department of Natural Resources
205 Butler Street, S.E.
Floyd Towers East
Atlanta, GA 30334

Prepared For: Brent Hansen (LCP Chemicals)

Date Published: July 18, 1990

Key Words and Phrases:

Reference Type: P

ReferenceID: 7

Title: *Tables 1 and 2 (counted and sorted by AEM) from Reference A-448*

Location: AEM

Category: Analytical Data

Prepared by/Author: AEM, Inc.

Preparer/Author Address: Malvern, PA 19355

Prepared For: Internal file

Date Published: December 10, 1999

Key Words and Phrases:

Reference Type: P

ReferenceID: 24

Title: *None: Tables of sample results for mercury in birds and crabs*

Location: AEM

Category: Analytical Data

Prepared by/Author: Unknown

Preparer/Author Address:

Prepared For: Unknown

Date Published: 1970s circa

Key Words and Phrases:

REFERENCES

Project Name LCP CHEMICALS

ProjectID: 04-07

Reference Type: S

ReferenceID: 8

Title: *Unilateral Administrative Order for Removal Response Activities
(Docket No. 94-15-C) and Amendment*

Location: AEM

Category: Legal

Prepared by/Author: US EPA Region IV

**Preparer/Author
Address:**

Prepared For: Director, US EPA Region IV

Date Published: April 4, 1994; amended March 27, 1995

**Key Words and
Phrases:**

Reference Type: S

ReferenceID: 9

Title: *Agreement and Administrative Order on Consent for Removal
Action (Docket No. 98-03-C) (Includes Appendices A, B, and C)*

Location: AEM

Category: Legal

Prepared by/Author: US EPA Region IV

**Preparer/Author
Address:**

Prepared For: US EPA, Region IV and US DOJ

Date Published: February 4, 1998

**Key Words and
Phrases:**

FISH ADVISORIES

Project Name **LCP CHEMICALS**

ProjectID: 04-07

Advisory: Turtle River ***AdvisoryID:*** 775
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: mercury
Species: seafood-other
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

Advisory: Turtle River ***AdvisoryID:*** 774
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: mercury
Species: shellfish-bivalves-clams
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

Advisory: Turtle River ***AdvisoryID:*** 770
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: mercury
Species: shellfish-crab-blue
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

FISH ADVISORIES

Project Name **LCP CHEMICALS**

ProjectID: 04-07

Advisory: Turtle River ***AdvisoryID:*** 772
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: mercury
Species: shellfish-mussels
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996
Status (Active or Rescinded): Active ***Date Rescinded:***
Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

Advisory: Turtle River ***AdvisoryID:*** 773
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: mercury
Species: shellfish-oysters
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996
Status (Active or Rescinded): Active ***Date Rescinded:***
Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

Advisory: Turtle River ***AdvisoryID:*** 771
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: mercury
Species: shellfish-shrimp
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996
Status (Active or Rescinded): Active ***Date Rescinded:***
Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

FISH ADVISORIES

Project Name **LCP CHEMICALS**

ProjectID: 04-07

Advisory: Turtle River ***AdvisoryID:*** 781
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: PCBs (total)
Species: seafood-other
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

Advisory: Turtle River ***AdvisoryID:*** 780
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: PCBs (total)
Species: shellfish-bivalves-clams
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

Advisory: Turtle River ***AdvisoryID:*** 776
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: PCBs (total)
Species: shellfish-crab-blue
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

FISH ADVISORIES

Project Name ***LCP CHEMICALS***

ProjectID: 04-07

Advisory: Turtle River ***AdvisoryID:*** 778
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: PCBs (total)
Species: shellfish-mussels
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

Advisory: Turtle River ***AdvisoryID:*** 769
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: PCBs (total)
Species: shellfish-oysters
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376

Advisory: Turtle River ***AdvisoryID:*** 777
Extent: (Purvis and Gibson Creeks; St. Simons Estuary)
Pollutant: PCBs (total)
Species: shellfish-shrimp
Population: NCGP
Population Definition: No Consumption-General Population: Advise against consumption by the general population.

Advisory Type: River ***Advisory Number:*** 9996

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Dr. Randall O. Manning ***Contact Number:*** 706-369-6376
