FINAL REPORT

ECOLOGICAL ASSESSMENT
ECOLOGICAL RISK EVALUATION OF THE SALT MARSH AND ADJACENT AREAS AT THE

LCP SUPERFUND SITE
BRUNSWICK, GA

April 1997

VOLUME 2: APPENDICES

PREPARED BY:

Mark D. Sprenger, Ph.D.
Environmental Response Team
Environmental Protection Agency

Nancy J. Finley
Environmental Response team
U.S. Fish and Wildlife Service

and

Mark Huston
Environmental Response Team
Response Engineering & Analytical Contract

Environmental Response Team Center
Office of Emergency and Remedial Response

Appendix A
Life Histories for Receptor Species
LCP Site
Brunswick, GA
April 1997

Wood Stork (*Mycteria americana*)

The wood stork is a Federally listed endangered species and has been documented to be present at the LCP site. Additionally, the wood stork is an upper trophic level receptor in the food chain exposure pathway which exists at the site.

Kahl (1964) noted that the wood stork will travel as far as 32 kilometers (km) to obtain food. This equates to a home range of approximately 794,193 acres. However, this article also notes that once the storks reach the feeding grounds, they may stay there until the next day, then fly back to the rookery. Additionally, wood storks will return to feeding areas at which they successfully obtain prey.

Breeding success is dependent upon successful feeding, typically associated with the concentration of forage species resulting from annual water cycles. In addition feeding success is dependent upon the reaction speed of the stork as feeding is tactile. Therefore, an alteration in the reaction speed (from an exposure to contaminants) of the wood stork may effect immediate health as well as reproductive success.

Marsh Wren (*Cistothorus palustris*)

Marsh wrens are small insectivorous birds that inhabit fresh and saltwater marshes. Marsh wrens are found throughout the northern United States and coastal areas to Florida (Verner 1965). Areas with standing water are typically selected as habitat and permanent water is necessary to provide food for the birds (Bent 1948). Marsh wrens feed on aquatic invertebrates, other insects, spiders and occasionally small crabs and snails which they take from the water surface or from the surface of vegetation (Kale 1965).

During breeding, male wrens establish territories which include both nesting sites as well as forage areas (Kale 1965). Nesting areas are usually associated with bulrushes, cattails, and sedges (Welter 1935). The incubation period lasts about two weeks with nestling occurring two weeks later (Verner 1965). Adults continue to feed the fledged young for 12 days (Verner 1965). Two to three broods of young per year may be produced depending on the population (Kale 1965).

Since marsh wrens are polygynous, each marsh system may have more females than males (Kale 1965). The average territory establish by males ranges between 0.006 to 0.17 hectares, depending on the habitat type (Kale 1965). Densities of birds within each territory have been reported to be as high as 120 adults per hectare (Kale 1965).

Clapper Rail (*Rallus longirostris*)

The clapper rail is small hen-like bird which is fairly abundant on the Atlantic coast. Another common name for the clapper rail is the marsh hen. The rail is found from Connecticut to as far south as the Gulf region (Terres 1982). The clapper rail is a salt marsh inhabitant with the exception of a endangered subspecies which lives in freshwater marshes along the Colorado River (Tomlinson and Todd 1973). Clapper rails obtained their name from their clattering and cackling calls.

Clapper rails feed at low tide along the banks of creeks and on mud flats (Terres 1982). Rails feed on fiddler crabs, crayfish, mollusks, worms, and other marine animals (Miller 1965), and occasionally on small fish (Poeciliidae and *Fundulus* spp.), aquatic insects, and amphibians (Oney 1954, Terres 1982).

Typical rail habitat consists of smooth cordgrass (79 percent), black rush (20 percent), and salt flats (1 percent) (Hon et al. 1977). Nests are built on high, dry locations within the salt marsh. Nests are placed 8-12 inches above the mud in small clumps of marsh grass (Kozicky and Schmidt 1949). Well defined raceways normally lead to the nests within the grasses (Bent 1926a). Nesting normally occurs from March to July and incubation takes 21-23 days with chicks fledged 63-70 days after hatching (Nice 1954, Adams and Quay 1958).

Diamondback Terrapin (*Malaclemys terrapin*)

The diamondback terrapin is a estuarine emydid turtle that has been documented to be present at the LCP site. Terrapins have a linear range along wetlands and intracoastal waterways from Massachusetts to Texas. The terrapin is an upper trophic level receptor in the food chain exposure pathway which exists at the site.

Terrapins utilize two types of habitats, estuarine waters for feeding and basking and sand beaches or upland areas for nesting. Diamondback terrapins exhibit what is termed short-range migrations. These short range migrations are believed to have evolved while animals were searching for suitable nesting or feeding grounds. Moll and Legler (1971) noted that a turtles home range consists on average of an area as large as two kilometers (km). During nesting, terrapins have been found to travel as far as 8 km (Hurd et al. 1979); however, distances to 250 meters are more typical (Palmer and Cordes 1988).

Feeding occurs in estuarine creeks and subtidal flats associated with *Spartina alterniflora* (cord grass) areas (Burger and Montevecchi 1975). Terrapins feed on a variety of crustaceans, mollusks, and other salt marsh invertebrates including snails (*Littorina irrorata* and *Melampus lineatus*), marine annelids (*Nereis* sp.), fragments of crabs (*Gelasimus*), and grass (Coker 1906).

Mating occurs during the spring and only females leave the tidal waters for nesting. The nesting period depends on the latitude with nesting periods varying from April 28 to July 1 in Florida (Seigal 1980) and June 10 to July 20 in Massachusetts (Lazell and Auger 1981). Between 4 and 18 eggs are deposited into flask shaped nests dug into the sand (Seigal 1980). Several clutches of eggs can occur during each season. Incubation periods are temperature dependent and vary between 61 to 104 days (Burger 1976). Sex determination in hatchling terrapins is also temperature dependent.

Terrapins are known to hibernate during colder periods in tidal creeks. They have been found beneath cut creek banks under 2.5 m of water (Yearicks et al. 1981) and in rare occasions in moist sand above the high tide mark (Lawler and Musick 1972).

Otter (*Lutra canadensis*)

River otter are mustelids which inhabit lakes, streams, and estuarine environments. Populations are stable or increasing along the coastal United States while midwestern populations are on the decline (Toweill and Tabor 1982). River otters are almost exclusively aquatic, found in food-rich coastal areas and areas with little impact from humans (Tabor and Wight 1977). Otters feed primarily on fish, frogs, and invertebrates (including crayfish, stonefly nymphs, and beetles) in coastal areas while the terrestrial inland populations feed on small mammals and birds (Palmer and Fowler 1975; Burt and Grossenheider 1980). Although an opportunistic feeder, the bulk of the otter's diet consists of fish (Loranger 1981).

River otters are active throughout the year with the most active period occurring during the winter (Larsen 1983). Adult males tend to be solitary. Breeding occurs in late winter or early spring for about a 3 month period (Pearson and Enders 1944). Female with 2-3 pups form a typical family unit and disperse 3 months after weaning (Melquist and Hornocker 1983). The river otter's home range varies by habitat and incorporates areas for foraging and reproduction. Each part of the home range is not used equally, with food supply having the greatest influence on the area (Melquist and Hornocker 1983). River otters prefer flowing water conditions over lakes and ponded area (Melquist and Hornocker 1983). Densities vary on habitat between one animal for every kilometer to one otter for every ten kilometers (Melquist and Hornocker 1983).

Raccoon (*Procyon lotor*)

Raccoons are medium sized omnivores and are abundant throughout North America. Raccoons prefer aquatic habitats, particularly hardwood swamps, flood plains, freshwater wetlands, and salt marshes (Kaufmann 1982). Raccoons have also adapted well to residential areas and farmlands. Raccoons rely heavily on surface waters for foraging and as a source of drinking water (Stuewer 1943). Raccoons are active primarily from dusk to dawn (Stuewer 1943) but will alter their activities to opportunistically feed on whatever is available (Sanderson 1987). For example, raccoons living near a salt marsh may become active during the day to take advantage of feeding opportunities during low tide (Ivey 1948). Raccoons feed primarily on fruits, nuts, acorns, grains, insects, frogs, crayfish, eggs (Palmer and Fowler 1975).

Raccoons in the southern regions of the U.S. are active year round (Goldman 1950). Adult raccoons are normally solitary but will come together for short periods of time during mating (Kaufman 1982). Mating occurs from March to June in southern areas and each male may mate with several females during each season (Sanderson 1987; Kaufman 1982). Young males are normally not sexually mature in the first breeding season but mature later in the summer, while females mature in the first year (Sanderson 1951).

The home range of a raccoon depends on the animal's age, habitat, food resources, and season (Sanderson 1987). Home ranges are typically a few hundred hectares but ranges as large as a few thousand hectares have been reported (Sanderson 1987). Population densities also depend strongly on the amount of resources in the area. Numbers of 0.1 to 0.2 animals per hectare are common (Hoffman and Gottschang 1977).

Manatee (*Trichechus manatus)*

Manatees are found in freshwater rivers or in salt or brackish water in shallow inlets, estuaries, and bays. They feed primarily on submerged vascular plants, but also consume some emergent and floating species (Hartman 1979). Hartman (1979) reported that animals often returned repeatedly to a preferred feeding area until food resources in that area were depleted. Manatees do not establish territories. They browse slowly along a coastline or river, and may cover up to 150 miles per summer (WWF 1990). Some migrate to warmer waters in winter, and return to the same sites yearly.

Killifish (*Fundulus heteroclitus*)

Killifish are small estuarine fish inhabiting salt, brackish, and freshwater marsh systems along the east coast of the United States to Mexico (Rosen 1973). Killifish are known by several other names including the mummichog, mud minnow, and killie (Abraham 1985). *Fundulus* utilize small pools on the marsh surface, the intertidal zone and tidal creeks as habitat. Although not commercially important, *Fundulus* serve as a prey base for many species (Abraham 1985).

Fundulus feed during daytime high tides (Weisberg et al. 1981) primarily on small crustaceans (harpacticoid copepods) and annelids (Fritz 1974; Baker-Dittus 1978). However, live plant material and detritus has also been found in the gut but is reported to have little nutritional value (Katz 1975). *Fundulus* are opportunistic feeders although they display size specific prey preferences (Schmelz 1964). Larger fish (>50 mm SL) are known to feed on fiddler crabs and grass shrimp while smaller fish (<50 mm SL) feed primarily on smaller crustaceans (e.g., *Hargeria rapax*)(Kneib 1986).

Killifish spawn throughout early spring to early fall (Hardy 1978). Availability of food controls the production of eggs and if feeding ceases so does vitellogenesis (Wallace and Selman 1980). Killifish may spawn up to eight times in each season, with spawning coinciding with spring high tides associated with new or full moons (semilunar periodicity) (Taylor and DiMichele 1980). Circadian periodicity may also influence spawning so maximum spawning occurs at night during a spring high tides (Taylor et al. 1979). Females in estuarine waters average 65 mm in length and produce 243 ova, while females in freshwater areas (salinity 0.6-15.5 ppt) average to 60 mm in length producing 161 ova (Fritz and Garside 1975). The differences appear to be related to differences in food density in less saline areas. Photoperiod and temperature also influence gonadal development and reproduction (Abraham 1985). Eggs are laid inside empty shells or along the outer leaves of cordgrass (Taylor and DiMichele 1983). Fertilized eggs are about 2 mm in diameter and may or may not display adhesive chorionic fibrils depending on substrate (Hardy 1978). Fundulus eggs incubate in air and hatching is controlled by the oxygen concentration and hydration of the eggs following immersion during the subsequent spring tide (DiMichele and Taylor 1981). The egg will rupture 15-20 minutes following immersion (Taylor et al. 1977).

Larvae emerge initially as free larvae (yolk-sac larvae) and remain so for 5.5 days depending on temperature (Taylor et al. 1977). Larvae attain the characteristics of the species (e.g., scales and fin rays) at 12.5 mm and are considered juveniles when they attain 25.0 mm (Hardy 1978). Females are mature at 38 mm while males mature at 32 mm (Hildebrand and Schroeder 1928). Fundulus are sexually mature in their second year (Hardy, 1978).

Killifish are stationary fish and breeding migrations do not occur (Rosen 1973). Larger fish (>60 mm) maintain a home range of about 36-38 meters (m) along the bank of a creek; however ranges have approached distances of 375 m (Lotrich 1975). Fundulus burrow in the mud in small pools during the winter months while some fish migrate to the tidal channel (Butner and Brattstrom 1960). Killifish normally return to the same channel following the winter season (Butner and Brattstrom 1960).

Fundulus serve as prey for wading birds including herons, and egrets, piscivorous duck and other birds including terns which inhabit the coastal marsh systems (Abraham 1985). Killifish are also preyed upon by predatory fish such as eels, bluefish and striped bass (Abraham 1985).

Brown shrimp (*Penaeus aztecus*)

The growth and development of the brown shrimp consists of a series of larval and juvenile stages, concluding with a reproductively active stage that is attained in approximately 8 to 10 months (Bray and Lawrence 1992). The sizes and weights of adults are extremely varied owing to food availability, population size, and water chemistry. Therefore, the best indicator of sexual maturity is the visual examination of the external reproductive parts of female specimens in a population. Courtship and mating usually occur at night with external fertilization and subsequent egg development in the water column. In the wild, adult females may produce 100,000 to 1,000,000 eggs per spawn (Bray and Lawrence 1992).

The first larval stage, or nauplii, molts 5 to 8 times before reaching the protozoea stage. During these molts, the nauplii obtains all of its nutrition from the yolk sac. Three protozoea stages are followed by 3 mysis stages and an indefinite number of megalopa stages before reaching the juvenile stage. All stages following the nauplii are actively feeding stages (Bailey-Brock and Moss 1992).

Juveniles are frequently found in shallow estuarine habitats ranging from intertidal marshes of *Spartina alterniflora*, *S. patens*, *Juncus roemerianus*, and *Scirpus robustus* to submerged vegetation such as *Ruppia martima*, *Halodule wrightii*, and *Vallisneria sp.* However, juveniles are also found in areas with little food or cover as a result of strong water currents and they can survive in waters with dissolved oxygen concentrations as low as 1 milligram per liter. Regardless of the habitat type, juveniles tend to prefer little vegetative cover on the substrate (Minello and Zimmerman 1991). Adults tend to prefer the higher salinities (28 to 36 parts per thousand) and greater depths offshore (Bailey-Brock and Moss 1992; Bray and Lawrence 1992).

The food habits of both juvenile and adult brown shrimp in the wild are elusive. Their feeding strategy is best classified as opportunistic omnivore (Bailey-Brock and Moss 1992). Plant detritus and their associated bacteria are believed to be important in the diet of juveniles. Benthic infauna and epifauna (e.g., copepods, amphipods, and polychaetes) are believed to be more important in the diet of adults (Minello and Zimmerman 1991). Adults feed by probing the substratum with the first three pairs of chelate pereiopods, grasping the prey items, and passing the prey items to their mouthparts (Bailey-Brock and Moss 1992).

The major predators of brown shrimp include flounder, pinfish, spot, killifish, sea trout, and red drum. The optimal prey size for these fish are shrimp that are 1/3 to 1/2 the total length of the predatory fish (Minello and Zimmerman 1991).

Blue crabs (*Callinectes sapidus*)

The blue crab is found from Massachusetts Bay to the east coast of South America in bays and brackish water estuaries (Hill et al. 1989). Blue crabs are an important commercial fishery for much of the east coast of the United States.

Growth and development of the blue crab consists of a series of larval, juvenile, and adult stages. After mating, females migrate to high salinity waters in estuaries, sounds, and near shore spawning areas where they overwinter. The following spring, eggs are fertilized by sperm stored over the winter and extruded onto the abdomen. Eggs are carried on the abdomen of the female crab for approximately two weeks before hatching. The newly hatched larvae, called zoea, drift offshore to feed and develop. After six or seven molts, the zoea metamorphoses into a post-larval form called a megalops. This post-larval stage enters bays and coastal estuaries; some studies indicate dispersal during this stage is substantial (Williams 1971). The megalopal stage molts into the juvenile crab, characterized by adult proportions and appearance. Juveniles migrate into shallow, low salinity waters in upper estuaries and rivers, where they feed and mature (Fischler and Walburg 1962).

Mature females range in size from 55-204 mm; males may reach 209 mm (Williams 1971). Although originally considered to be a scavenger, studies on food habits have shown that the blue crabs are active predators. Bivalves, crustaceans and fish comprise the majority of the diet of juveniles and adults (Van Heukelem 1991). Tagatz (1968) reported the following dietary composition (by volume): 39 percent bivalves, 15 percent crabs, and other crustaceans, 19.4 percent fish, 1.8 percent annelids, 3.9 percent plant material, and 19.8 percent detritus. In intertidal marshes, blue crabs show a distinct preference for marsh periwinkles, although killifish are also consumed (Van Heukelem 1991).

Fiddler crabs (*Uca pugnax*)

Fiddlers crabs are perhaps the most conspicuous invertebrates of the salt marsh ecosystem. Because of their high densities (Montague 1980), fiddler crabs fill a significant ecological role in the salt marsh, primarily affecting nutrient cycling and energy flow (Montague 1980; Daiber 1982). Burrowing activities of the fiddler crab have a pronounced effect on increasing the growth and biomass of marsh grass (*Spartina alterniflora*) presumably due to increased soil drainage, aeration, and litter decomposition (Montague 1980). Perturbations of the marsh caused by fiddler crab foraging accounts for a complete turnover of the top 5 mm of the marsh surface each year (Krauter 1976; Edwards and Frey 1977). Foraging activities and subsequent production of fecal pellets can release as much as 9 milligrams/square meter/ day of organic nitrogen back into the marsh (Krauter 1976)

Adult fiddler crabs leave their burrows for feeding during low tide (Grimes et al. 1989). Fiddler crabs feed by picking through particulate organic matter in the salt marsh mud (Miller 1961; Miller 1965), but are also predators on small crustacea, nematodes, and segmented worms (Hoffman et al. 1984). Fiddler crabs are a common prey item for marsh fish, birds, mammals, and other crustaceans (Adams 1976; Heard 1975; Peterson and Peterson 1979; Shanholtzer 1973; Montague 1980). Thus, they are important trophic components of the salt marsh ecosystem.

Fiddler crabs mate in the spring and summer (Grimes et al. 1989). Clutch sizes range from 1,500 to 94,000 eggs, depending on the size of the female crab (Decoursey 1979). Larvae are released during nocturnal high tides. The timing of the release of larvae presumably limits predation pressure on the adult females, and allows the larvae (zoea) to be carried from the marsh into open water where they continue the developmental process (Crane 1975; DeCoursey 1979; Christy 1982). The larvae go through five developmental stages, each lasting from one week to one month (Herrnkind 1968). During the spring and summer, fiddler crab larvae comprise a significant component of the estuarine planktonic community (Sandifer 1973). Fifth stage larvae metamorphose into the first juvenile crab stage. There are 3 developmental juvenile crab stages (each lasting from three to seven days), during which, the young crabs are weak, cling to objects, and are incapable of burrowing (Hyman 1920; Hyman 1922; Herrnkind 1972). The fiddler crab matures into its adult form in one year; the life span of the crab has been estimated at 1.0-1.5 years (Shanholtzer 1973).

References

Abraham, B.J. 1985. "Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic)--mummichog and striped killifish." *Biological Report* 82(11.40). U.S. Fish and Wildlife Service. Washington, DC.

Adams, S.M. 1976. "Feeding ecology of eelgrass fish communities." *Transactions of the American Fisheries Society*, 105:514-519.

Adams, D.A., and Quay, T.L. 1958. "Ecology of the clapper rail in southeastern North Carolina." *Journal of Wildlife Management,* 22(2):149-156.

Bailey-Brock, J.H. and S.M. Moss. 1992. "Penaeid Taxonomy, Biology and Zoogeography." In: A.O. Past and L.J. Lester, eds. *Marine Shrimp Culture: Principles and Practices.* Elsevier Press, Amsterdam. 862pp.

Baker-Dittus, A.M. 1978. "Foraging patterns of three sympatric killifish." *Copeia* 1978(3):383-389.

Bent, A.C. 1926. "Life histories of North American marsh birds." *U.S. National Musesum of History Bulletin No.* 135. Washington, DC.

Bent, A.C. 1948. "Life histories of North American nuthatches, wrens, thrashers, amd their allies." *U.S. National Museum of History Bulletin No.* 195. Washington, D.C.

Bray, W.A. and A.L. Lawrence. 1992. "Reproduction of *Penaeus* Species in Captivity." In: A.O. Past and L.J. Lester, eds. *Marine Shrimp Culture: Principles and Practices.* Elsevier Press, Amsterdam. 862pp.

Burger, J. 1976. "Determinants of hatching success in diamondback terrapin, *Malaclemys terrapin.*" *American Midland Naturalist,* 97(2):444-464.

Burger, J., and W.A. Montevecchi. 1975. "Nest site selection in diamondback terrpain, *Malaclemys terrapin.*" *Copeia* 1975(1):113-119.

Butner, A., and Brattstrom, B.H. 1960. "Local movement in *Menidia* and *Fundulus.*" *Copeia* 1960(2):139-141.

Coker, R.E. 1906. "The natural history and cultivation of the diamond-back terrapin, with notes on other forms of turtles." *North Carolina Geological Survey Bulletin,* 14:1-67.

Crane, J. 1975. *Fiddler crabs of the world Ocypodidae: Genus Uca.* Princeton University Press, Princeton, NJ. 736 pp.

Christy, J.H. 1982. "Adaptive significance of semilunar rhythms of larval release in fiddler crabs (genus *Uca*): test for an hypothesis." *Biological Bulletin (Woods Hole),* 163:251-253.

Daiber, F.C. 1982. *Animals of the tidal marsh.* Van Nostrand Reinhold, New York. 422 pp.

DeCoursey, P.J. 1979. "Egg-hatching rhythms in three species of fiddler crabs." In: E. Naylor and R.G. Hartnoll, eds. *Cyclic phenomena in marine palnts and animals.* Pergammon Press, New York. pp. 399-406.

DiMichele, L., and Taylor, M.H. 1981. "The mechanism of hatching in *Fundulus heteroclitus*: development and physiology." *Journal of Experimental Zoology,* 217(1):73-80.

Edwards, J.M. and R.W. Frey. 1977. "Substrate characteristics within a Holocene salt marsh, Sapelo Island, Georgia." *Senckenb. Marit.* 9:215-219.

Fischler, K.J. and C.H. Walburg. 1962. "Blue crab movement in coastal South Carolina, 1958-59." *Transactions of the American Fisheries Society,* 91:275-278.

Fitz, E.S. 1974. "Total diet comparison in fishesby Spearman rank correlation coeeficients." *Copeia* 1974(1):210-214.

Fitz, E.S., and Garside, E.T. 1975. "Comparison of age composition, growth, and fecundity between two populations each of *Fundulus heteroclitus* and *Fundulus diaphanus* (Pisces: Cyprinodontidae)." *Canadian Journal of Zoology,* 53(4):361-369.

Goldman, E.A. 1950. *Raccoons of North and Middle America.* Washington, DC: U.S. Fish and Wildl. Service.

Grimes, B.H., M.T. Huish, J.H. Kerby, and D. Moran. 1989. "Species profiles: life histories and environmental requirements for coastal fisheries and invertebrates (Mid-Atlantic)--Atlantic marsh fiddler." *U.S. Fish and Wildlife Service Biological Report,* 82(11.114). U.S. Army Corps of Engineers, TR EL-82-4. 18 pp.

Hardy, J.D., Jr. 1978. "Development of fishes of the Mid-Atlantic Bight: an atlas of egg, larval, and juvenile stages. Vol 2: Anguillidae through Syngnathidae." *U.S. Fish and Wildife Service Biological Service Program,* FWS/OBS-78/12. 458 pp.

Hartman, D.S. 1979. Ecology and behavior of the manatee, *Trichechus Manatus* Linnaeus, in Florida. Amer. Soc. Mammal. Spec. Publ. No. 5.

Heard, R.W. 1975. "Feeding habits of the white catfish from a Georgia estuary." *Florida Science,* 38(1):20-28.

Herrnkind, W.F. 1968. "The breeding of *Uca pugilator* (Bosc) and mass rearing of the larvae with comments on the behovior of the larval and early crab stages (Brachyura, Ocypopidae)." *Crustaceana Suppl.* 2:214-224.

Herrnkind, W.F. 1972. "Orientation on shore living arthropods, especially the sand fiddler crabs." Pages 1-59 in H.E.

Hill, J., D.L. Fowler, and M.J. Van Den Avyle. 1989. "Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic)--Blue crab." *U.S. Fish and Wildlife Service Report,* 82(11.100). U.S. Army Corps of Engineers, TR EL-82-4. 18 pp.

Hildebrand, S.F., and Schroeder, W.C. 1928. *Fishes of Chesapeake Bay.* Smithsonian Institution Press, Wahington, D.C. 366 pp.

Hoffman, C.O., and Gottschang, J.L. 1977. "Numbers, distribution, and movements of a raccoon population in a suburban residential community." *Journal of Mammalogy,* 58:623-636.

Hoffman, J.A., J Katz, and M.D. Bertness. 1984. "Fiddler crab, *Uca pugnax*, deposit feeding and meiofaunal abundance in salt marsh sediments." *Journal of Experimental Marine Biology and Ecology,* 82: 161-174.

Hon, T., Odum, R.R., and Belcher, D.P. 1977. "Results of Georgia's clapper rail banding program." *Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies,* 31:72-76.

Hurd, L.E., G.W. Smedes, and T.A. Dean. 1979. "An ecological study of a natural population of diamondback terrpains (*Malaclemys t. terrapin*) in a Delaware salt marsh." *Estuaries* 2(1):28-33.

Hyman, O.W. 1920. "On the development of Gelasimus after hatching." *Journal of Morphology,* 33:485-525.

Hyman, O.W. 1922. "Adventures in the life of a fiddler crab." *Report Smithsonian Institution for 1920.* 443-460.

Ives, R.D. 1948. "The raccoon in the salt marshes of northern Florida." *Journal of Mammalogy,* 29:290-291.

Kale, H.W., II. 1965. "Ecology and bioenergetics of the long-billed marsh wren *Telmatoidytes palustris griseus* (Brewster) in Georgia salt marshes." *Publication of the Nuttail. Ornithology Club No.* 5.

Katz, L.M. 1975. "Laboratory studies on diet, growth, and energy requirements of *Fundulus heteroclitus* (Linnaeus)." *Ph.D. Dissertation.* University of Delaware, Newark. 81 pp.

Kaufman, J.H. 1982. "Raccoon and allies." In: Chapman, J.A.; Feldhamer, G.A., eds. *Wild mammals of North America.* Baltimore, MD: John Hopkins University Press; pp. 567-585.

Kozicky, E.L., and Schmidt, F.V. 1949. "Nesting habits of the clapper rail in New Jersey." *Auk* 66:355-364.

Kneib, R.T. 1986. "The role of *Fundulus heteroclitus* in salt marsh trophic dynamics." *Ameican Zoologist*, 26:256-259.

Krauter, J.N. 1976. "Biodeposition by salt marsh invertebrates." *Marine Biology*, 35:221-223.

Larsen, D. 1983. "Feeding habits of river otters in coastal southeastern Alaska." *Journal of Wildlife Management*, 48:1446-1452.

Lawler A.R., and J.A. Musick. 1972. "Sand beach hibernation by a northern diamondback terrapin *Malaclemys terrapin terrapin.*" *Copeia* 1972(2):389-390.

Lazell, J.D., Jr., and P.J. Auger. 1981. "Predation on diamonback terrpain (*Malaclemys terrapin*) eggs by dune grass (Ammophila breviligulata)." *Copeia* 1981(3):723-724.

Loranger, A.J. 1981. "Late fall and early winter foods of the river otter *Lutra canadensis* in Massachusetts, 1976-1978." In: Chapman, J.A., Pursley, D., eds. *Worldwide Furbearer Conference Proceedings*, Vol. 1; August 3-11.

Lotrich, V.A. 1975. "Summer home range and movements of *Fundulus heteroclitus* (Pisces: Cyprinodontidae) in a tidal creek." *Ecology* 56(1):191-198

Melquist, W.E., and Hornocker, M.G. 1983. "Ecology of river otters in west central Idaho." In: Kirkpatrick, R.L., ed. *Wildlife Mongraphs*: Vol. 83. Bethesda, MD: The Wildlife Society; 60 pp.

Miller, D.C. 1961. "The feeding mechanisms of fiddler crabs, with ecological considerations of feeding adaptations." *Zoologica* 46:89-100.

Miller, D.C. 1965. "Studies on systematics, ecology, and geographical distribution of certain fiddler crabs." *Ph.D. Dissertation.* Duke University, Durham, N.C. 240 pp.

Minello, T.J. and R.J. Zimmerman. 1991. "The Role of Estuarine Habitats in Regulating Growth and Survival of Juvenile Penaeid Shrimp." In: P.F. DeLoach, W.J. Dougherty, M.A. Davidson, eds. *Frontiers of Shrimp Research.* Elsevier Press, Amsterdam. 294pp

Moll, E.O., and J.M. Legler. 1971. "The life history of a neotropical slider turtle, *Pseudemys scripta* (Schoepff) in Panama." *Bulletin of the Los Angeles County Museum of Natural History, (Sci.)* 11:1-102.

Montague, C.L. 1980. "A natural history of temperate western Atlantic fiddler crabs (Genus *Uca*) with reference to their impact on the salt marsh." *Contributions to Marine Science*, 23:25-55.

Nice, M.M. 1954. "Problems of incubation periods in North Americal birds." *Condor* 56(4):173-197

Oney, J. 1954. "Final report, clapper rail survey and investigations study." *Georgia Game and Fish Commission,* Atlanta. 50 pp.

Palmer, W.M., and C.L. Cordes. 1988. "Habitat suitability index models: Diamondback terrpin (nesting)--Atlantic coast." *U.S. Fish and Wildlife Service Biological Report* 82(10.151).

Palmer, E.L., and Fowler, H.S. 1975. *Fieldbook of natural history*. New York, NY; McGraw-Hill Co.

Pearson, O.P. and Enders R.K. 1944. "Durationof pregnancy in certain Mustelids." *J. Exp. Zool.* 95:21-35.

Peterson, C.H. and N.M. Peterson. 1979. "The ecology of intertidal flats of North Carolina: a community profile." *U.S. Fish and Wildlife Service Biological Service Program.* FWS/OBS-79/39. 73 pp.

Rosen, D.E. 1973. "Suborder Cyprinodontodei." In: Cohen, D.M., Marshall, N.B., Ebeling, A.W., Rosen, D.E., Iwamoto, T., Sonoda, P., McDowell, S.B., Weed, W.H., III, and Woods, L.P. *Fishes of the western North Atlantic.* Sears Found. Mar. Res. Mem. 1, Pt. 6, Yale University. pp. 229-262.

Sanderson, G.C. 1951. "Breeding habits and a history of the Missouri raccoon population from 1941 to 1948." *Transactions of the North American Wildlife Conference,* 16:445-461.

Sanderson, G.C. 1987. "Raccoon." In: Novak, M., Baker, J.A., Obbarel, M.E., eds. *Wild furbearer management and conservation.* Pittsburg, PA: University of Pittsburg Press; pp. 487-499.

Sandifer, P.A. 1973. "Distribution and abundance of decapod crustacean larvae in the York River estuary and adjacent lower Chesapeake Bay, Virginia. 1968-1969." *Chesapeake Science,* 14(4):235-257

Shanholtzer, S.F. 1973. "Energy flow, food habits, and population dynamics of *Uca pugnax* in the salt marsh system." *Ph.D. Dissertation.* University of Georgia, Athens.

Seigal, R.A. 1980. "Nesting habits of diamondback terrapins, *Malaclemys terrapin tequesta.*" *Journal of Herpetology,* 14(1):87-89

Stuewer, F.W. 1943. "Raccoons: their habits and management in Michigan." *Ecological Monographs,* 13:203-257.

Schmelz, G.W. 1964. "A natural history of the mummichog, *Fundulus heteroclitus* (Linnaeus), in Canary Creek marsh." M.S. Thesis. University of Delaware, Newark, 65 pp.

Tagatz, M.E. 1968. "Biology of the blue crab, *Callinectes sapidus* Rathbun, in the St. Johns River River, Florida." *Fisheries Bulletin,* 67 17-33

Taylor, M.H., and DiMichele, L. 1980. "Ovarian changes during the lunar spawning cycle of *Fundulus heteroclitus.*" *Copeia* 1980(1) 118-125

Taylor, M.H., and DiMichele, L., and Leach, G.J. 1977. "Egg stranding in the life cycle of the mummichog *Fundulus heteroclitus.*" *Copeia* 1977(2) 397-399

Taylor, M.H., and DiMichele, L. 1983. "Spawning site utilization in a Delaware population of *Fundulus heteroclitus* (Pisces Cyprinodontidae)." *Copeia* 1983(3) 719-725

Taylor, M.H., Leach, G.J., DiMichele, L., Levitan, W.H., and Jacob, W.F. 1979. "Lunar spawning cycle in mummichog, *Fundulus heteroclitus* (Pisces Cyprinodontidae)." *Copeia* 1979(2):291-297.

Terres, J.K. 1982. *The Audubon Society encyclopedia of North American birds.* Alfred A. Knopf, Inc., New York.

Tomlinson, R.E., and Todd, R.L. 1973. "Distribution of two western clapper rail races as determined by responses to taped calls." *Condor* 75 177-183.

Towell, D.E., and Tabor, J.E. 1982. "River otter." In: Chapman, J.A., Feldhammer, G.A., eds. *Wild mammals of North*

American. Baltimore, MD: Johns Hopkins University Press; pp. 688-703.

Verner, J. 1965. "Breeding biology of the long-billed marsh wren." *Condor* 67:6-30.

Van Heukelem, W.F. 1991. "Blue Crab, *Callinectes sapidus*." pp. 6.1-6-24, In: *Habitat Requirements for Chesapeake Bay Living Resources*. Funderburk, S.L., J.A. Mihursky, S.L. Jordan, and D. Riley (eds.) Chesapeake Research Consortium, Solomons, Maryland.

Williams, A.B. 1971. "A ten-year study of meroplankton in North Carolina estuaries: Annual occurrence of some brachyuran developmental stages." *Chesapeake Science*, 12:53-61.

Wallace, R.A., and Selman, K. 1980. "Oogenesis in *Fundulus heteroclitus*. 2: The transition from vitellogenesis into maturation." *General Compendium of Endocrinology*,42(3):345-354.

Weisberg, S.B., Whalen, R., and Lotrich, V.A. 1981. "Tidal and diurnal influence on food consumption of a saltmarsh killifish, *Fundulus heteroclitus*." *Marine Biology (Berl.)*, 61(2-3): 243-246.

Winn and B.L. Olla, eds. *Behavior of marine animals, current prospectives in research. Volume 1: Invertebrates*. Plenum Press, New York, 244 pp.

Welter, W.A. 1935. "The natural history of the long-billed marsh wren." *Wilson Bulletin*, 47:3-3

World Wildlife Fund (WWF). 1990. *The Official World Wildlife Fund Guide to Endangered Species of North America. Volume I: Plants, Mammals*. Matthews, J.R. and C.J. Moseley (eds.). Beacham Publishing, Inc. Washington, D.C.

Yearicks, E.F., R.C. Wood, and W.S. Johnson "Hibernation of the northern diamondback terrapin, *Malaclemys terrapin terrapin*." *Estuaries* 4(1):78-80.

Appendix B
Exposure Profiles
LCP Site
Brunswick, GA
April 1997

Wood stork

The wood stork is the only native stork in North America, north of Mexico. It inhabits thickly wooded swamps and marshes with dense growths of reeds and shrubs. Though primarily a freshwater bird, it is frequently observed in saltwater marshes (Eckert 1976). This is a gregarious species and is rarely seen alone. Storks are usually seen in groups or with other wading birds, eating, roosting, nesting, migrating, and performing all other activities (Eckert 1976). Therefore, feeding at the LCP marsh may impact a number of individuals, which is a concern as this is an endangered species.

Adult storks weigh 2050 grams (g) (Dunning 1993), and consume 520 g (wet weight) of food per day (Kahl 1964). Dietary composition is mostly fish, however, wood storks eat a wide variety of small prey including frogs, water snakes, lizards, minnows, wood rats, fiddler crabs, turtles, tadpoles, and water beetles (Eckert 1976).

For the purposes of this risk assessment, a body weight of 2.05 kg, an ingestion rate of 0.520 kg/day, and a diet of 100 percent killifish will be used to calculate a dose. An incidental sediment ingestion rate was calculated based on a 2 percent sediment ingestion rate as reported in Beyer et al. (1994). The food ingestion rate of 0.520 kg/day wet weight was converted to a dry weight ingestion rate by multiplying by 24 percent solids. A value of 24 percent solids was obtained from the average percent solids of killifish collected from the site. Therefore, a food ingestion rate of 0.125 kg/day dry weight multiplied by 0.02 percent equals a sediment ingestion rate of 0.003 kg/day, dry weight. The impact of incidental water ingestion will not be evaluated (Table B-1).

Marsh Wren

An average adult male marsh wren weighs 10.6 g, while an average female weighs 9.4 g (U.S. EPA 1993). Kale (1965) noted similar weights with adult marsh wrens weighing about 10 g with males generally 10 percent larger than females.

Adult males consume 0.96 g/g-day (0.0102 kg/day), while females ingest 0.99 g/g-day (0.0093 kg/day)(U.S. EPA 1993). Kale (1965) noted a similar ingestion rate of 0.99 g of food per day. Summer and winter diets are similar, with summer diet composed of 91.5 percent terrestrial insects, 1.8 percent crabs and amphipods, 3.5 percent snails, and 4.5 percent other (U.S. EPA 1993). Dietary composition consists mostly of aquatic invertebrates, other insects, spiders and occasionally small crabs and snails which they take from the water surface or from the surface of vegetation (Kale 1965).

Since marsh wrens are polygamous, each marsh system may have more females than males (Kale 1965). The average territory established by males ranges between 0.006 to 0.17 hectares, depending on the habitat type (Kale 1965). Densities of birds within each territory have been reported to be as high as 120 adults per hectare (Kale 1965).

For the purposes of this risk assessment, an average body weight of 0.010 kg, an average ingestion rate of 0.00975 kg/day, wet weight, and a diet of 100 percent grasshoppers will be used to calculate a dose to marsh wren. In addition, an incidental water ingestion rate of 0.0027 L/day will be used in the dose calculation. An incidental sediment ingestion rate was calculated based on a 2 percent sediment ingestion rate as reported in Beyer et al. (1994). The food ingestion rate of 0.00975 kg/day, wet weight was converted to a dry weight ingestion rate by multiplying by 30 percent solids. A value of 30 percent solids was obtained from the average percent solids of grasshopper collected from the site. Therefore, a food ingestion rate of 0.003 kg/day, dry weight multiplied by 0.02 percent equals a sediment ingestion rate of 0.00006 kg/day, dry weight (Table B-1).

Clapper Rail

Clapper rails collected from Brunswick, GA during this study weighed between 181 and 310 g (mean of 254 g), wet weight (WESTON 1997). Dunning (1993) found the average adult female to weigh 0.271 kg while the average adult male weighs 0.323 kg. It inhabits estuarine tidal salt marshes along the east coast of the United States (Lewis and Garrison 1983). Estimated food intake for the species ranges from 19.2 to 28.1 grams of food per day, dry weight (U.S. EPA 1993). Average water intake across this range of size would be 1.9 to 2.8 liters per day (U.S. EPA 1993). Soil ingestion ranged from trace amounts to 5 percent (by volume, stomach contents; Roth et al. 1972). A water ingestion rate of 71 ml/day was reported (mean body weight, 280 g; Hammons et al. 1988).

Clapper rails are omnivorous, but feed primarily on parasitic worms, clam worms, snails, crabs, insects, spiders, and fish (Lewis and Garrison 1983) . Their main source of food appears to be fiddler crabs and snails (Zembal and Fancher 1988). They rarely eat plant material (Lewis and Garrison 1993).

Home ranges as large as 483 meters along canals and tidal ditches and 274 meters in diameter have been reported in Louisiana and South Carolina, respectively (Roth et al. 1972; Blandin 1963). Meanly (1985) stated that the minimum summer home range is 168 yards along canals and tidal ditches.

For the purposes of this risk assessment, a body weight of 0.254 kg, an ingestion rate of 0.07 kg/day, wet weight. A wet weight food ingestion rate was calculated by multiplying the dry weight food ingestion rate (0.0192 - 0.0281 kg/day) by 32 percent solids. The percent solids was an average from the fiddler crab collected during this study. The provided food ingestion rates of 0.06 to 0.08 kg/day, wet weight. An average of these values was used as an ingestion rate (0.07 kg/day, wet weight). A diet of 80 percent fiddler crabs and 20 percent marsh snails will be used to calculate a dose to clapper rail. An incidental sediment ingestion rate of 5 percent of the dry weight food ingestion provides a dry weight sediment ingestion rate of 0.0009 to 0.0014 kg/day. For the purposes of this risk assessment, a sediment ingestion rate of 0.001 kg/day, dry weight will be used. A water ingestion rate of 0.071 L/day will be used to evaluate the exposure from incidental water ingestion (Table B-1).

Diamondback terrapin

The diamondback terrapin commonly occurs in coastal saltmarshes and tidal creeks along the east coast. Although terrapins have been known to travel large distances in search of nesting areas, terrapins typically limit their migration and concentrate within a small area in a salt marsh. Various radio tracking studies have indicated a 1 to 2 km range is typical during most normal feeding periods (Auger, pers. comm.).

Adult terrapins exhibit sexual dimorphorism, mature females displaying carapace lengths of 15 to 23 centimeters (cm) while mature males have carapace lengths of 10 to 14 cm (Palmer and Cordes 1988). Terrapins collected from the LCP site displayed carapace lengths ranging from 14.9 to 18.9 cm in females and from 11.8 to 11.9 cm in males. Seigel (1984) reported females reached sexual maturity at plastron lengths of 13.5 to 14.0 cm while males reach maturity at plastron lengths of 9.0 to 9.5 cm. The maximum weight recorded for mature females was 903 g while the maximum weight of mature males was 258 g. An average body weight of 143 g was reported for individuals with an average plastron length of 89.6 mm (Allen and Littleford 1955).

Dietary composition consists of crustaceans, mollusks, and other salt marsh invertebrates including snails (*Littorina irrorata* and *Melampus lineatus*), marine annelids (*Nereis* sp.), fragments of crabs (*Gelasimus*), and grass (Coker 1906). Gut analysis of terrapins collected indicated that the diet was composed largely of *Littorina* sp. and fiddler crabs. Gut contents weighed approximately 11.8 g (wet weight). Hildebrand (1929) cited an ingestion rate of 3 pounds per year (3.7 g/day) for pen raised terrapins.

For the purposes of this risk assessment, a body weight of 0.143 kg, an ingestion rate of 0.0037 kg/day, and a diet of 50 percent fiddler crabs and 50 percent marsh snails will be used to calculate a dose. An incidental sediment ingestion rate was calculated by multiplying 0.0037 kg/day wet weight by 30 percent solids. This provides a food ingestion rate of 0.001 kg/day, dry weight. Multiplying this value by 4.5 percent sediment ingestion (a sediment ingestion rate for box turtle, Beyer et al. 1994) yields a sediment ingestion rate of 0.00005 kg/day, dry weight (Table B-1).

River Otter

River otters are commonly found in food-rich coastal areas and areas with little impact from humans (Tabor and Wight 1977). The river otter's home range varies by habitat and incorporates areas for foraging and reproduction. Each part of the home range is not used equally, food supply having the greatest influence on the area (Melquist and Hornocker 1983). Female home range was found to be 295 ha while the male's range was 400 ha in a Texas coastal marsh (Foy

1984). The same study found 0.0094 to 0.014 animals per ha (Foy 1984).

Otters feed primarily on fish, frog and invertebrates (including crayfish, stonefly nymphs, and beetles) in coastal areas while the terrestrial inland populations feed on small mammals and birds (Palmer and Fowler 1975; Burt and Grossenheider 1980). Although an opportunistic feeder, the bulk of the otter's diet consists of fish (Loranger 1981). Wayne (1979) reported an ingestion rate of 1 to 1.5 kg/day, wet weight.

Adult male otters found in Alabama and Georgia weighed from 5.84 to 10.4 kg and adult females weighed from 4.74 to 8.72 kg (Lauhachinda 1978). Throughout their range river otters vary from 5.0 to 15 kg among both sexes (Melquist and Donkert 1987).

For the purposes of this risk assessment, a body weight of 5.84 kg (smallest body weight reported from Georgia), an ingestion rate of 1.5 kg/day, and a diet of 100 percent killifish will be used to calculate dose. A 2 percent incidental sediment content from Beyer et al. (1994) was used to calculate an incidental sediment ingestion rate. The food ingestion rate of 1.5 kg/day, wet weight was multiplied by 24 percent solids (mean percent solids for killifish collected from the site) to yield a food ingestion rate of 0.36 kg/day, dry weight. This value was multiplied by 2 percent to yield an incidental sediment ingestion rate of 0.0072kg/day, dry weight. A water ingestion rate of 0.42 L/day was calculated using the allometric equation derived by Calder and Braun (1983) (Table B-1).

Manatee

Manatees are found in freshwater rivers or in salt or brackish water in shallow inlets, estuaries, and bays. Adult manatee normally weigh less than 500 kg (Hall 1981). The World Wildlife Federation (1990) reported that manatee can reach weights up to 1590 kg.

They feed primarily on submerged vascular plants, but also consume some emergent and floating species (Hartman 1979). No data were found for ingestion rates of wild animals, but captive animals have been reported to ingest between 7 and 50 kg of food per day (wet weight; Hartman 1979). Hartman (1979) reported that animals often returned repeatedly to a preferred feeding area until food resources in that area were depleted.

Manatees do not establish territories. They browse slowly along a coastline or river, and may cover up to 150 miles per summer (WWF 1990). Some migrate to warmer waters in winter, and return to the same sites yearly. Incidental sediment or water ingestion will not be used in the dose calculations (Table B-1).

Raccoon

Raccoons are found in nearly every aquatic habitat. During the last 50 years raccoon populations have increased greatly (Sanderson 1987). In Alabama, adult male raccoons weighed up to 8.8 kg (mean 4.31 kg) while adult female can weigh up to 5.9 kg (mean 3.67 kg) (Johnson 1970). Adult raccoons weigh between 2 and 12 kg (Nowak 1991), and consume 0.5 kg of food per day (Newell et al. 1987).

Raccoons feed primarily on fruits, nuts, acorns, grains, insects, frogs, crayfish, eggs (Palmer and Fowler 1975). In a Maryland forested bottomland, the dietary composition of raccoons during the summer was principly made up of insects (39 percent), wild cherry (17 percent), blackberries (16 percent), crayfish (8 percent), snails (5 percent), herptiles (5 percent), fish (2 percent), rodents (2 percent), corn (1 percent), and trace amounts of *Smilax*, acorns and pokeberry (Llewellyn and Uhler 1952). At Washington state tidewater area raccoons displayed the following dietary composition: molluscs, mussels and oyster (44 percent), Crustacea, shrimp and crabs (25 percent), fish (9 percent), marine worms (20 percent), and Echiurida worms (1 percent) (Tyson 1950).

The home range of a raccoon depends on the animal's age, habitat, food resources, and season (Sanderson 1987). Home ranges are typically a few hundred hectares but ranges as large as a few thousand hectares have been reported (Sanderson 1987). The home range for adult male raccoon found in coastal Georgia raccoons is approximately 65 ha (± 18 SE) while the home range for adult females in the same area is approximately 39 ha (± 16 SE) (Lotze 1979).

Population densities also depends strongly on the amount of resources in the area. Numbers of 0.1 to 0.2 animals per hectare is common (Hoffman and Gottschang 1977).

For the purposes of this risk assessment, a body weight of 2 kg, and ingestion rate of 0.5 kg/day, and a diet of 90 percent fiddler crabs and 10 percent marsh snails. A soil ingestion rate of 9.4 percent of the diet has been reported for raccoons (Beyer et al. 1991). A wet weight ingestion rate of 0.5 kg/day was converted to a dry weight ingestion rate by multiplying by the percent solids in fiddler crab collected from the site (32 percent). This yields a food ingestion rate of 0.16 kg/day, dry weight. Multiplying the ingestion rate by 9.4 percent yields a sediment ingestion rate of 0.015 kg/day, dry weight. A daily water ingestion rate of 0.18 L/day was calculated using an allometric equation derived by Calder and Braun (1983) (Table B-1).

The life history information presented below is for informational purposes only. These receptors are not used in the ingestion-based hazard quotient calculations.

Killifish

Fundulus feed during daytime high tides (Weisberg et al. 1981) primarily on small crustaceans (harpacticoid copepods) and annelids (Fritz 1974; Baker-Dittus 1978), although live plant material and detritus has also been found in the gut but is reported to have little nutritional value (Katz 1975). *Fundulus* feed opportunistically and fish display size specific prey preferences (Schmelz 1964). Larger fish (>50 mm SL) are known to feed on fiddler crabs, and grass shrimp, while smaller fish (<50 mm SL) feed primarily on smaller crustaceans (e.g., *Hargeria rapax*)(Abraham et al. 1982).

Fundulus have a higher than average assimilation efficiency (87percent based on laboratory diets) (Weisberg and Lotrich 1982) and laboratory reared fish achieve maximum growth when consuming 6percent of their body weight (Prinslow et al. 1974).

Fundulus are stationary fish and breeding migrations do not occur (Rosen 1973). Larger fish (>60 mm) maintain a home range of about 36-38 meters (m) along the bank of a creek; however ranges have approached distances of 375 m (Lotrich 1975). Females reach sexual maturity at 30 to 35 mm, while males reach maturity at 32 mm (Kneib and Stiven 1978). Based on a North Carolina population, *Fundulus* weigh 251 mg for the average male and 245 mg for the average female (Kneib and Stiven 1978).

Fiddler Crab

Fiddler crab, *Uca pugnax*, weighs between 0.27 and 0.70 grams wet weight (from REAC field data). Fiddler crabs are omnivorous, feeding on food items ranging from detritus, diatoms, fungi and vascular plants to small crustacea, nematodes, and segmented worms (Shanholtzer 1973; Hoffman et al. 1984). They have been observed to eat up to 0.4 grams (dry weight) of material over a six hour period in laboratory studies (Valiela et al. 1974).

Fiddler crabs have a great effect on nutrient cycling and energy flow in the salt marsh ecosystem, due to burrow excavation, feeding bioturbation, and production of fecal material (Montague 1980). In addition, a wide variety of predators (fish, bird, and crustacean) feed on fiddler crabs, which, due to their abundance in the salt marsh, makes them an important food source for these animals (Grimes et al 1989).

No estimates of fiddler crab home ranges could be found, however, due to their territorial behavior (Hyatt and Salmon 1978) and high densities (Teal 1958) in salt marsh ecosystems it was estimated that an area use factor (AUF) of 100percent was appropriate for the species

Blue Crab

Blue crabs collected near Brunswick, GA weighed from approximately 46 to 300 grams (WESTON 1997), and have been observed to consume over 4 grams of food (dry weight) per day in laboratory tests (Arnold 1984). No sediment or water ingestion rates for the blue crab could be found in the literature. Blue crabs are predators that primarily feed on fish, bivalves, brachyurans, and gastropods. For this risk assessment, it was assumed that fish comprised 50 percent of the diet, bivalves and brachyurans each comprised 20 percent of the diet, and gastropods comprised the remaining 10 percent of the diet (Hsueh et al. 1992).

Blue crabs migrate yearly for breeding, and some tagged females have been captured up to 100 to 540 km from their release sites (Hill et al. 1989). Blue crabs generally move to deep, warmer water in winter, and return to rivers, tidal creeks, and salt marshes when conditions become favorable in the spring (Livingston 1976). Although blue crabs are excellent swimmers and can travel long distances, they rarely move from one estuarine system to another (Porter 1956; Judy and Dudley 1970). For the purposes of this risk assessment, a conservative area use factor (AUF) of 100 percent was assumed.

Brown Shrimp

Brown shrimp, *Penaeus aztecus*, collected near Brunswick, GA weighed on average between 7.7 and 20.4 grams wet weight (WESTON 1997). Brown shrimp are omnivorous, feeding on food items ranging from detritus to small invertebrates and fish during different stages of their life cycle (Larson et al. 1989). No ingestion rates could be found for brown shrimp. For the purposes of this risk assessment, it was assumed that small invertebrates comprised 100percent of the shrimps diet.

The life cycle of the brown shrimp includes offshore spawning, oceanic larval development, and migrations into estuaries as post-larvae (Gleason and Wellington 1988). Detritivorous post larval and juvenile brown shrimp are essential for converting much of the primary production in estuaries to forms available to higher consumers in the salt marsh ecosystem. A wide variety of predators (fish and crustacean) feed on shrimp (Larson et al. 1989).

Like other estuarine invertebrates, brown shrimp are seasonally migratory (Gleason and Wellington 1988). However, for the purposes of this risk assessment, a conservative area use factor (AUF) of 100 percent was assumed.

References

Abraham, B.J. 1985. *Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic)--mummichog and striped killifish.* Biological Report 82(11.40), U.S. Fish and Wildlife Service, Washington, DC.

Allen, J.F. and R.A. Littleford. 1955. " Observations on the feeding habits and growth of immature diamondback terrapins." *Herpetologica,* 11:77-80.

Arnold, W.S. 1984. "The effects of prey size, predator size, and sediment composition on the rate of predation of the blue crab, *Callinectes sapidus* on the hard clam, *Mercenaria mercenaria*." *Journal of Experimental Marine Biology and Ecology,* 80:207-219.

Beyer, W.N., E.E. Conner and S. Gerould. 1991. "Estimates of soil ingestion by wildlife." *Journal of Wildlife Management,* 58:375-382.

Blandin, W.W. 1963. "Renesting and multiple brooding habits of marked clapper rails." *Proceedings of the Annual Conference of the Southeast Association of Game and Fish Commissions,* 17:60-68.

Calder, W.A. and E.J. Braun. 1983. "Scaling of osmotic regulation in mammals and birds." *American Journal of Physiology,* 244:601-606.

Dunning, J.B. Jr.(Ed.). 1993. *CRC Handbook of Avian Body Masses.* Boca Raton, FL: CRC Press.

Fritz, E.S. 1974. "Total diet comparison in fishes by Spearman rank correlation coefficient." *Copeia*, 210-214.

Gleason, D.F. and G.M. Wellington. 1988. "Food resources of postlarval brown shrimp (*Penaeus aztecus*) in a Texas salt marsh." *Marine Biology*, 97:329-337.

Grimes, B.H., M.T. Huish, J.H. Kerby, and D. Moran. 1989. *Species profiles: life histories and environmental requirements for coastal fisheries and invertebrates (Mid-Atlantic)--Atlantic marsh fiddler.* U.S. Fish Wildl. Serv. Biol. Rep. 82(11.114). Washington, D.C.

Hall, E.R. 1981. *The Mammals of North America. VOL. II.* New York, NY: John Wiley and Sons.

Hartman, D.S. 1979. "Ecology and behavior of the manatee, *Trichechus Manatus* Linnaeus, in Florida." *American Society of Mammalogy*. Special Publication No. 5.

Hildebrand, S.F. 1929. "Review of experiments on artificial culture of diamond-back terrapin." *Bureau of Fisheries Document*, Number 1060.

Hill, J., D.L. Fowler, and M.J. Van Den Avyle. 1989. *Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic)--Blue crab.* U.S. Fish Wildl. Serv. Rep. 82(11.100). Washington, D.C.

Hoffman, J.A., J Katz, and M.D. Bertness. 1984. "Fiddler crab, *Uca pugnax*, deposit feeding and meiofaunal abundance in salt marsh sediments." *Journal of Experimental Marine Biology and Ecology*, 82:161-174.

Hsueh, Pan-wen, J.B. McClintock, and T.S. Hopkins. 1992. "Comparative study of the diets of the blue crabs *Callinectes similis* and *C. sapidus* from a mud-bottom habitat in Mobile Bay, Alabama." *Journal of Crustacean Biology*, 12(4):615-619.

Hyatt, G.W., and M. Salmon. 1978. "Combat in the fiddler crabs *Uca pugilator* and *Uca pugnax*: a quantitative analysis." *Behavior*, 65:182-211.

Johnson, A.S. 1970. "Biology of the raccoon (*Procyon loter varius* Nelson and Goldman) in Alabama." *Alabama Cooperative Wildlife Research Unit; Auburn Univ. Agric. Exp. Stn. Bull.* 402.

Judy, M.H. and D.L. Dudley. 1970. "Movements of tagged blue crabs in North Carolina waters." *Commercial Fisheries Review*, 32(11):29-35.

Kale, H.W. II. 1965. "Ecology and bioenergetics of the long-billed marsh wren, *Telmatodytes palustris griseus* (Brewster) in Georgia salt marshes." *Publication of the Nuttall Ornithological Club No. 5.*

Katz, L.M. 1975. "Laboratory studies on diet, growth, and energy requirements of *Fundulus heteroclitus* (Linnaeus)." Ph.D. Dissertation. University of Delaware, Newark, DE.

Kneib, R.T. 1986.

Kneib, R.T. and A.E. Stiven. 1978. "Growth, reproduction, and feeding of *Fundulus heteroclitus* (L.) on a North Carolina salt marsh." *Journal of Experimental Marine Biology and Ecology*, 31:121-140.

Larson, S.C., M.J. Van Den Avyle, and E.L. Bozeman, Jr. 1989. *Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic)--brown shrimp.* U.S. Fish Wildl. Serv. Biol. Rep. 82(11.90). Washington, D.C.

Lauhachinda, V. 1978. "Life history of the river otter in Alabama with emphasis on food habits." Ph.D. Dissertation University of Alabama, Auburn, AL.

Lewis, J.C., and R.L. Garrison. 1983. *Habitat suitability index models: clapper rail.* U.S. Deptartment of the Interior, Fish and Wildlife Service Report FWS/OBS-82/10-51. Washington, D.C.

Livingston, R.J. 1976. "Diurnal and seasonal fluctuations of organisms in a north Florida estuary." *Estuarine Coastal and Marine Science,*4:373-400.

Llewellyn, L.M., and Uhler, F.M. 1952. "The foods of fur animals of the Patuxent Research Refuge, Maryland." *American Midland Naturalist,* 48:193-203.

Lotrich, V.A. 1975. "Summer home range and movements of *Fundulus heteroclitus* (Pisces: Cyprinodontidae) in a tidal creek." *Ecology* 56:191-198.

Lotze, J.H. 1979. "The raccoon (*Procyon loter*) on St. Catherines Island, Georgia." In. *Comparisons of home ranges determined by livetrapping and radiotracking.* New York, NY: American Museum of Natural History; Rep. No. 2664.

Meanly, B. 1985. *The marsh hen: A natural history of the clapper rail of the Atlantic coast salt marsh.* Centerville, MD: Tidewater Publishers.

Melquist, W.E., and Donkert, A.E. 1987. "River otter." In *Wild furbearer management and conservation.* Novak, N., Baker, J.A., and Obbarel, M.E. (Eds). Pittsburgh, PA: University of Pittsburgh Press; pp. 627-641.

Montague, C.L. 1980. "A natural history of temperate western Atlantic fiddler crabs (Genus *Uca*) with reference to their impact on the salt marsh." *Contributions to Marine Science,* 23:25-55.

Porter, H.J. 1956. "Delaware blue crab." *Estuarine Bulletin.* 2(2):3-5.

Prinslow, C.H., and N.M. Peterson. 1979. *The ecology of intertidal flats of North Carolina: a community profile.* U.S. Fish and Wildl. Serv. Program FWS/085-79/39. Washington, D.C.

Rosen, D.E. 1973. "Suborder Cyprinodontoidei." In. *Fishes of the western North Atlantic.* D.M. Cohem, N.B. Marshall, A.W. Ebeling, D.E. Rosen, T. Iwamoto, P. Sonoda, S.B. McDowell, W.H. Weed III, and L.P. Woods (Eds.) Mem. 1, Pt. 6. Sears Foundation for Marine Research, Yale University. pp. 229-262.

Roth, R.R., J.D. Newsom, T. Joanen, and L.L. McNease. 1972. "The daily and seasonal behavior patterns of the clapper rail (*Rallus longirostris*) in the Louisiana coastal marshes." *Proceedings of the Annual Conference of the Southeast Association of Game and Fish Commisions.* 26:136-147.

Roy F. Weston, Inc. (WESTON). 1997. Final Report, Ecological Risk Evaluation of the Salt Marsh and Adjacent Areas at the LCP Site, Brunswick, GA. Report prepared for the U.S. Enviornmental Protection Agency under Contract 68-C4-0022. Edison, NJ.

Schmelz, G.W. 1964. "A natural history of the mummichog, *Fundulus heteroclitus* (Linnaeus), in Canary Creek marsh." M.S. Thesis. University of Delaware, Newark, DE.

Seigel, R.A. 1984. "Parameters of two populations of diamondback terrapins (*Malaclemys terrapin*) on the Atlantic coast of Florida." In. *Vertebrate Ecology and Systematics. A Tribute to Henry S. Fitch.* Eds. Seigel, R.A., L.E. Hunt, J.L. Knight, L. Malaret, and N.L. Zuschlag. Kansas City, KS: Mus. Nat. Hist. Univ. Kans. Spec. Publ. 10. pp. 77-87.

Shanholtzer, S.F. 1973. "Energy flow, food habits, and population dynamics of *Uca pugnax* in the salt marsh system."

Ph.D. Dissertation. University of Georgia, Athens, GA.

Teal, J.M. 1958. "Distribution of fiddler crabs in Georgia salt marshes." *Ecology*, 39(2):185-193.

Tyson, E.L. 1950. "Summer food habits of the raccoon in southwest Washington." *Journal of Mammalogy*, 31:448-449.

U.S. Environmental Protection Agency. 1993. *Wildlife exposure factors handbook, Volume* I. U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C. EPA/600/R-93/187a

Valiela, I.D., D.F. Babiec, W. Atherton, S. Seitzinger, and C. Krebs. 1974. "Some consequences of sexual dimorphism: feeding in male and female fiddler crabs *Uca pugnax* (Smith)." *Biological Bulletin (Woods Hole)*, 147(3):652-660.

Weisberg, S.B., and V.A. Lotrich. 1982. "The importance of an infrequently flooded intertidal marsh surface as an energy source for the mummichog *Fundulus heteroclitus*: an experimental approach." *Marine Biology (Berl.)*, 66:307-310.

Weisberg, S.B., R. Whalen, and V.A. Lotrich. 1981. "Tidal and diurnal influence on food consumption of a saltmarsh killifish, *Fundulus heteroclitus*." *Marine Biology (Berl.)*, 61:243-246.

World Wildlife Fund (WWF). 1990. *The Official World Wildlife Fund Guide to Endangered Species of North America. Volume I: Plants, Mammals.* Matthews, J.R. and C.J. Moseley (Eds.). Washington, D.C.: Beacham Publishing, Inc.

Zembal, R., and J.M. Fancher. 1988. "Foraging behavior and foods of the light-footed clapper rail." *The Condor*, 90:959-962.

Table B-1 Summary of Exposure Profile Information and LOAELS Used in the Hazard Quotient Calculations
LCP Site
Brunswick, GA
April 1997

	Body weight (kg)	Ingestion Rate (kg/day, wet weight)	Sediment Ingestion Rate (kg/day, dry weight)	Water Ingestion Rate (L/day)	Diet (percent)
Wood stork	2.05	0.52	0.003	NA	100% Killifish
Marsh wren	0.01	0.00975	0.00006	0.00296	100% Grasshopper
Clapper rail	0.254	0.07	0.001	0.071	80% Crabs, 20% Snail
Diamondback terrapin	0.143	0.0037	0.00005	NA	50% Crabs, 50% Snail
River otter	5.84	1.5	0.0072	0.42	100% Killifish
West Indian manatee	500	50	NA	NA	100% Vegetation
Raccoon	2	0.5	0.015	0.18	90% Crabs, 10% Snails

Appendix C
Effects Profile for Polychlorinated Biphenyls
LCP Site
Brunswick, GA
April 1997

Polychlorinated Biphenyls

The PCBs are a group of 209 synthetic halogenated aromatic hydrocarbons that are extremely stable and degrade slowly when released into the environment (Eisler 1986). Polychlorinated biphenyls have low aqueous solubility (Chou and Griffin 1986), are not readily leachable in soils being strongly adsorbed by soil constituents (Chou and Griffen 1986; Strek and Weber 1982). The retention of PCBs in soil is function of the soil organic matter and clay content (Chou and Griffen 1986). Being lipophilic, PCBs tend to bioaccumulate strongly within the food web of ecosystems. Organisms with higher lipid contents and/or higher in the food chain tend to obtain greater tissue concentrations than organisms with lower lipid contents and/or lower in the food chain. Because of the numerous competing interactions involved with PCB fate and transport within any particular ecosystem, it is difficult to accurately predict PCB accumulation from literature studies. Site specific data is currently the best method of evaluating the bioaccumulation potential for any particular ecosystem.

The bioaccumulation of PCBs, from soils, by terrestrial plants has been documented as very low (Iwata et al. 1976; Iwata and Gunther 1976; Weber and Mrozek 1979). In addition, the uptake of PCBs by aquatic plants has also been reported (Moza et al. 1974); collectively, the literature indicates that these compounds can be accumulated by plants, both aquatic and terrestrial, but that the levels observed indicate accumulation factors of less than 1.

The general sublethal effect of PCBs on plants is reduced growth via a reduction in photosynthetic activity as a result of diminished chlorophyll content of the plant (Strek and Weber 1982; Mahanty 1973).

Polychlorinated biphenyls tend to be readily bioaccumulated by fish and, to a lesser degree, aquatic invertebrates. Interspecific differences in sensitivity to PCBs are large, even between species that are taxonomically closely related. The sublethal effects of direct and dietary exposure of PCBs to aquatic organisms include reduced growth, reduced reproduction, and biochemical perturbations. Dietary exposure of PCBs to birds tends to be more of an important route than exposure via water and soil ingestion. The sublethal effects of dietary exposure to birds range from disruptions in growth, metabolism, behavior, and reproduction to hepatic effects (Eisler 1986).

The primary biochemical effect of PCBs is to induce hepatic mixed function oxidase systems, which biotransform and/or detoxify xenobiotic chemicals. In addition, PCBs also induce hepatic enzymes that metabolize naturally occurring steroid hormones (Peakall 1975). The effect of PCBs on hepatic microsomal enzyme systems are most likely correlated with observed adverse reproductive effects (Tanabe 1988).

Wood Stork

Several studies were reviewed that evaluated dietary PCB exposure to birds. Several studies conducted on American kestrels (*Falco sparverius*) indicated that elevated PCB levels in prey caused chronic effects at a cellular level.

PCBs disrupt normal patterns of growth, reproduction, metabolism and behavior and in general, PCB accumulation is rapid. Diet is an important route of PCB accumulation and concentrations in the liver were the highest (900 mg/kg) in piscivorous birds (Eisler 1987). In addition, PCBs are known to reduce eggshell thickness and a reduction in eggshell thickness of 15 - 20 percent is suggested as critical value beyond which population numbers will decline (Nygard 1983).

American kestrels (*Falco sparverius*) were fed 33 mg/kg of dietary Aroclor for 62 - 69 days (equivalent to 9 - 10 mg/kg body weight/day). These birds showed a significant decline in sperm concentration (Bird et al. 1983). Treated kestrels contained PCB residues in their muscle of 107 mg/kg lipid weight and in the testes at 128 mg/kg lipid weight. For the control birds, these values were 0.4 mg/kg lipid weight in muscle and 1.0 mg/kg lipid weight in testes. These results suggest that migratory flesh-eating birds feeding on PCB-contaminated prey might consume enough toxicant to alter their semen quality in that breeding season. This could reduce the fertility of the eggs and reproductive fitness of the individuals.

In another study, American kestrel were fed dead cockerels that had been injected with 0.5 mg/kg or 5 mg/kg (2 mg/kg/day) Aroclor 1254 or 1262 (Lincer and Peakall 1970). At the end of the five month test period, the birds were sacrificed and the livers removed. Livers from the birds fed 5 mg/kg PCBs were stained and the density of the staining measured cytophotometrically at 545 nanometers (nm). The livers from the birds injected with 0.5 mg/kg were not examined for histopathological changes. The authors conclude that the decrease in the percentage transmission is a consequence of more cytoplasmic RNA in the treated kestrels and conclude that the physiological actions of PCBs are similar to that of dichloro-diphenyl-trichloethane (DDT) and its metabolites.

Nestling white pelicans captured from the wild received 100 mg of Aroclor 1254 (16 mg/kg BW/day) as daily oral doses for 10 weeks in addition to their diet. Following the 10 week exposure, the birds were stressed for an additional 2 weeks by reducing their food consumption in half. The initial mean body weight of the birds prior to the treatment was 6.2 kg. The mean body weight at the end of the 12 week experimental period was 4.8 kg. Micrograph examination of the livers from the birds in the treatment group indicated a 22 percent increase in hepatocyte size, a significant ($p<0.05$, $F=1.96$) 25 percent increase in the number of mitochondria, a significant ($p<0.05$, $F=8.39$) 20 percent fewer cristae per mitochondria, and a 22 percent increase in the number of lysosomes, microbodies, and other membrane-bounded vacuoles (Stotz and Greichus 1978).

For the purposes of this risk assessment, a LOAEL of 2 mg/kg/day will be used to calulate risk to the wood stork. This value was multiplied by a factor of 10 for use as an acute value (20 mg/kg/day) and was divided by a factor of 10 for use as a NOAEL (0.2 mg/kg/day) (Table C-1).

Marsh wren and clapper rail

No studies were located that evaluated the effects of PCBs specifically on the marsh wren or clapper rail. However, other studies were located which determined the effects of PCBs on other bird species. Robins, *Erithacus rubecula*, fed a diet containing 5 mg Clophen A50 per day for a period of 11 to 13 days displayed abnormal nocturnal behavior and activity patterns compared to control birds (Ulfstrand et al. 1971). The average body weight of this robin is reported to be 18.2 grams (Dunning 1993). Subsequently, the daily dose would equal 0.275 mg Clophen A50/kg/day.

Peakall and Peakall (1973) maintained ring doves on a diet which contained 1.12 mg Aroclor 1254 /kg/day in chicken feed. This dose was calculated using 11.2 gm/day as the ingestion rate, and 100 grams as a body mass estimate (data based on mourning dove; Kenaga 1973). They found that reproductive success was dependent on exposure of the female to the PCB compound. Females fed PCB spiked food were less attentive to their nest and had erratic nesting behaviors which interfered with egg development. Artificial incubation greatly increased the breeding success for these birds.

Dietary exposure of mallard ducks to 2,000 mg/kg of Aroclor 1254 (435 mg/kg BW/day) in a single administered dose and 2,699 mg/kg (587 mg/kg BW/day) in the diet for 5 days (Heath et al. 1972) resulted in 50 percent mortality of the test population. For this risk assessment, these concentrations have been converted to 200 mg/kg (43.5 mg/kg BW/day) and 269.9 mg/kg (58.7 mg/kg BW/day) using an accepted conversion factor of 10.

For the purposes of this risk assessment, a LOAEL of 0.275 mg/kg/day will be used to calculate risk to the marsh wren and clapper rail. This value was multiplied by a factor of 10 for use as an acute value (2.75 mg/kg/day) and was divided by a factor of 10 for use as a NOAEL (0.275 mg/kg/day) (Table C-1).

Raccoon, otter, and manatee

No studies were found that evaluated the effects of PCB compounds on the otter. Several studies have noted the presence of high levels of PCB compounds in otter tissue and scats (Mason and Ratford, 1994; Mason, 1993). Anecdotal evidence from these studies suggests a link between high levels of PCBs and sub-lethal and lethal effects on otter populations, but experimental approaches to the problem are absent from the literature. Several studies were available on the effects of PCBs on the mink, and these values will consequently be used to establish an acceptable LOAEL for the otter.

Several studies were found pertaining to the dietary toxicity of PCBs to mink, most of which examined its effects on reproduction, growth and survival. Mink are one of the most sensitive organisms to the effects of PCBs (Giesy et al. 1994). Reproductive effects are seen at parent dietary levels as low as 0.13 mg/kg BW/day (Heaton et al. 1995) and embryo toxicity at parent dietary levels of 0.66 mg/kg BW/day (Aulerich and Ringer 1977). Some adult mortality and behavioral effects are seen at dietary levels starting at 0.148 mg/kg BW/day (Platanow and Karstad 1973), reduced adult weight at dietary levels starting at 1.31 mg/kg BW/day (Aulerich and Ringer 1977), and complete adult mortality at dietary levels starting at 3.3 mg/kg BW/day (Aulerich and Ringer 1977).

Male and female ranch-bred mink were acclimated to a diet consisting of ocean fish scraps, commercial mink cereal, and meat by-products. Ocean fish scraps made up 40 percent of this diet. Dietary treatment levels were prepared by substituting 10, 20, and 40 percent of the ocean fish scraps with PCB-contaminated carp. The mean dietary PCB concentrations were 0.015 mg/kg (control), 0.72 mg/kg (10 percent carp), 1.53 mg/kg (20 percent carp), and 2.56 mg/kg (40 percent carp). Groups of 15 mink (3 males, 12 females) were assigned to one of the four treatment groups for a period of 12 weeks. Mink receiving the highest PCB-containing diet (40 percent carp or 0.32 mg/kg BW/day, as reported by the investigators) exhibited a 42 percent reduction in mean litter size, 86 percent fewer live kits at birth, and no kits surviving beyond 24-hours post-partum. Even mink receiving the 10 percent carp diet (or 0.13 mg/kg BW/day, as reported by the investigators) exhibited a 67 percent reduction in kits surviving 3 to 6 weeks relative to the control (Heaton et al. 1995).

One-year-old mink were fed a diet of beef and cereal prepared from cows which had been given 10 consecutive daily oral doses of 1 and 10 mg/kg of Aroclor 1254 dissolved in an olive oil and dairy concentrate (Platanow and Karstad 1973). The cows did not exhibit any clinical, gross, or histopathological signs of PCB toxicity. The cows were killed 24 hours following the last dose, and the musculature, liver, and kidneys ground and mixed with commercial mink food cereal at a level of 24 percent cereal. The resulting rations containing 0.64 and 3.57 mg/kg of total PCB were fed to mink for a period of 160 days. The mink were fed this diet *ad libitum* two months prior to the breeding season and continued for 160 days. All 16 mink that were fed 3.57 mg/kg of PCBs died by day 105. Two of the 16 mink that were fed 0.64 mg/kg died by days 122 and 129. The mink exhibited poor appetites, lethargy, and weakness before dying. Some passed tarry feces, indicating gastrointestinal hemorrhaging. At both treatment levels, males survived longer than females. These doses were converted to a daily exposure concentration by multiplying them with the inverse of the lowest reported body weight of the mink (0.55 kg) and the food ingestion rate of the mink (0.121 kg/day). This yielded exposure concentrations of 0.148 and 0.785 mg/kg BW/day for the 0.64 and 3.57 mg/kg dose, respectively.

Eight month old mink fed a basal diet containing 1.0 mg/kg of Aroclor 1254 for a period of approximately 6 months exhibited no mortality or any significant changes in the thyroid, pituitary, adrenal glands, or serum T3 and T4 levels (Wren et al 1987a). Reproduction and kit development was evaluated under the same test conditions in a separate study (Wren et al. 1987b) by the same investigators. Male fertility and female offspring production were not affected by the 1.0 mg/kg Aroclor 1254 diet. However, growth rate of kits nursed by exposed mothers was significantly reduced. The investigators estimated the daily exposure concentrations to be 0.10 mg/kg BW/day for males and 0.18 mg/kg BW/day for females.

In a preliminary study to determine the cause of reproductive complications in mink fed Great Lakes fish, adult breeder mink were fed a basal diet supplemented with 30 mg/kg of PCBs for 6 months (181 days). However, all of the mink died emaciated by the end of the experimental period (Aulerich and Ringer 1977). For this risk assessment, the 30 mg/kg dose was converted to a daily exposure of 6.6 mg/kg BW/day.

As a result of this preliminary study, a long-term study was conducted to ascertain the effects of long-term, low-level consumption of PCBs on growth. Mink were fed a basal diet supplemented with 5 and 10 mg/kg of PCBs for a period of approximately 8.5 months. The basal diet plus 10 mg/kg of PCBs resulted in a significant 56 percent decrease in body weight gain after a period of 4 months. Body weight gain was reduced by 39 percent in the 5 mg/kg treatment group, but this reduction was not significant. Both the 5 and 10 mg/kg treatment groups failed to produce offspring; the control group produced 17 live and 8 dead kits. Various degrees of embryo toxicity were observed during necropsy of the treated animals (Aulerich and Ringer 1977). The 5 and 10 mg/kg doses were converted to a daily exposure concentration by multiplying it with the inverse of the lowest body weight reported by the investigators for this treatment group (0.923 kg) and the food ingestion rate (0.121 kg/day) of the mink. This yielded exposure concentrations of 0.66

and 1.31 mg/kg BW/day for the 5 and 10 mg/kg treatment group, respectively.

Based on the results of this experiment, another experiment was conducted to determine the effects of long-term consumption of low-level PCBs on reproduction. Fifteen mg/kg of PCB as Aroclor 1254 in the diet resulted in a complete inhibition of reproduction and 31 percent adult mortality, compared to 6 percent mortality in the controls. Five mg/kg of Aroclor 1254 resulted in a 95 percent reduction in the number of kits born live; the ratio of live kits to female adult was reduced by 87 percent. However, in an effort to determine the persistency of the impaired reproductive condition, 11 adult females that received 5 mg/kg of Aroclor 1254 for a period of 6 months were placed on a control diet for 1 year. The results indicate that the impaired reproductive performance of these females was not a permanent condition (Aulerich and Ringer 1977). The 5 and 15 mg/kg dose was converted to a daily exposure concentration by multiplying it with the inverse of the lowest reported body weight for the mink (0.55 kg) and the food ingestion rate (0.121 kg/day) of the mink to yield exposure concentrations of 1.1 and 3.3 mg/kg BW/day, respectively.

For the purposes of this risk assessment, a LOAEL of 0.13 mg/kg/day (Heaton et al. 1995) will be used to calculate a hazard quotient for the raccon, otter, and manatee. An acute value of 3.3 mg/kg/day (Aulerich and Ringer 1977) and a NOAEL of 0.10 mg/kg/day (Wren et al 1987) will be used in the hazard quotient calculations (Table C-1).

Diamondback terrapin

Bergeron et al. (1994) linked two PCB compounds with significant estrogenic effects in red-eared sliders (*Trachemys scripta*). Four weeks after laying (period of greatest sensitivity to exogenous estradiol) eggs were treated singly with 11 different PCB compounds ranging from two to five chlorine substitutions. Eggs were incubated at 27.8 degrees Celsius (°C), which produces all male turtles in this species. Eggs were "spotted" with a low (0.88 mg/kg) and high (8.8 mg/kg) dose of PCB compounds. Two of the eleven compounds produced a significant increase in sex reversal at the high dose. 2',4',6'-trichloro-4-biphenyl produced hatchlings with female gonads and oviducts in 100% of the treated eggs. 2',3',4',5'-tetrachloro-4-biphenyl produced hatchling with female gonads (50% of hatchlings) and oviducts (71% of hatchlings). Other PCB compounds produced non-significant changes in sex of hatchlings. Positive controls (estradiol-17, produced 100% females) and negative controls (ethanol carrier, produced 100% males) confirmed the sensitivity of the eggs to exogenous hormonal control of development and normal development, respectively.

Bishop et al. (1991) found a cause-effect relationship between concentrations of organochlorine contaminants and deformities in eggs of the common snapping turtle (*Chelydra s. serpentina*) in the Great Lakes region. Deformities observed in hatchling turtles and embryos included deformed tails, hind-and forelimbs, nostrils, upper and lower jaws, craniums, and carapaces. Other deformities included missing claws, enlarged yolk sacs, and missing eyes. The most common deformity was tail abnormality. Eggs from a contaminated site contained a mean PCB concentration of 2.7 mg/kg, wet weight as compared to a reference location with mean PCB levels of 0.076 mg/kg. During the five years of study, 30.5% of eggs at a contaminated site produced hatchling or embryos with deformities as compared to 2.2% at the reference location. Although PCBs were the major source of contamination in the eggs low levels of other organo-chlorines including chlordane, hexachlorobenzene, and dioxin were detected and may confound results. However, regression analyses show that 2,3,3',4,4'-pentachlorobiphenyl was most strongly correlated with deformities.

Male Caspian terrapins (*Mauremys caspica rivulata*) collected from a polluted area were administered 6 treatments of 125 ppm of Aroclor 1254 in soybean oil for a period of 3 weeks. This dose resulted in a 30-fold increase in PCBs levels in the liver but no changes in the content or activity of cytochrome P-450. The investigators speculate that despite the high dose, the specimens may have developed a tolerance to contaminants from living in a polluted environment. However, it is not clear from this study whether the terrapins were fed during the exposure period. If the terrapins were fed, the 125 ppm dose may be an over-estimate of the actual dose (Yawetz et al. 1983).

For the purposes of this risk assessment, the treatment of 125 ppm (mg/kg) was converted to a dose by multiplying the 125 mg/kg by an ingestion rate of 0.0037 kg/day (Hildebrand 1929) and dividing by a body weight of 0.143 kg (Allen and Littleford 1955) to obtain a LOAEL 3.23 mg/kg/day. This LOAEL was converted to a NOAEL by dividing by 10 to obtain a dose of 0.32 mg/kg/day and further converted to an acute value by multiplying by a factor of 10 (32.32 mg/kg/day)

The information presented below is for informational purposes only and is not used to calculate hazard quotients.

Killifish

Gulf killifish, *Fundulus grandis,* were exposed to 400 mg/l solution of Aroclor 1242 in a static non-renewal system. Levels of neurotransmitters after a 24-hour exposure were significantly higher in test animals as compared to controls for two of the four neurotransmitters under consideration. Norepinephrine and dopamine levels were significantly decreased, while 5-hydroxyindoleacetic acid and 5-hydroxytryptamine levels were not significantly changed. Locomotor activity was measured over a three day exposure period. Experimental animals showed increased movement within the test chamber as measured in crossing of fixed lines marked on the bottom of the tank. Control animals had mean of 3.6 line crossings per 10 minutes as compared to 94.0 for the experimental animals on day 1. Significant differences were also measured on day 2 and 3 (last day of experiment). It was hypothesized that Aroclor 1242 caused excessive releases of dopamine, thereby increasing locomotion and decreasing the brain concentration of dopamine. Measured reductions in norepinephrine may also be contributing to increased locomotion in the gulf killifish.

Coho salmon were fed a diet containing 0.048 mg/kg (1.45 µg/kg BW/day) to 480 mg/kg (14,500 µg/kg BW/day) of Aroclor 1254 for 260 days at 17° Celsius (Mayer et al. 1977). Fish in the highest exposure group began dying by day 260 and all were dead by day 265. This mortality was associated with a mean whole body concentration of 645 mg/kg. Changes in growth or survival were not observed in any of the other dietary exposures. The maximum concentration of Aroclor 1254 at which no adverse effects on growth or survival were observed was 48 mg/kg (1,450 µg/kg BW/day). The highest mean whole body concentration associated with no adverse effect on growth or survival was 54 mg/kg. Thyroid metabolism was significantly increased however, by all except the lowest concentration. The increase ranged from 52 percent by fish receiving 0.48 mg/kg (14.5 µg/kg BW/day) to 119 percent by fish receiving 480 mg/kg (14,500 µg/kg BW/day). Equilibria between Aroclor 1254 concentrations in food and in tissue was reached by day 112 by fish fed 0.048 mg/kg (1.45 µg/kg BW/day), 0.48 mg/kg (14.5 µg/kg BW/day), and 4.8 mg/kg (145 µg/kg BW/day) in food. Fish fed 48 mg/kg (1,450 µg/kg BW/day) and 480 mg/kg (14,500 µg/kg BW/day) in food reached equilibria by 200 days (Mayer et al. 1977). However, the ecological significance of changes in thyroid metabolism was not addressed by the investigators, but was presented as a biomarker for PCB exposure.

In the same study (Mayer et al. 1977), dietary exposure to Aroclor 1232, 1248, 1254, and 1260 at concentrations of 2.4 mg/kg (72.5 µg/kg BW/day) and 24 mg/kg (725 µg/kg BW/day) for 193 days at 26°C resulted in no adverse effects on growth or survival of channel catfish. Mean whole body concentrations following exposure to 2.4 and 24 mg/kg of Aroclor were as follows: 3.2 and 14.0 mg/kg, respectively (Aroclor 1232), 1.9 and 13.0 mg/kg, respectively (Aroclor 1248), 4.8 and 21.0 mg/kg, respectively (Aroclor 1254), and 3.5 and 32.0 mg/kg, respectively (Aroclor 1260). A significant increase in thyroid metabolism was observed with exposure to Aroclor 1254 only, at both concentrations (Mayer et al. 1977).

Blue crab

No information could be found regarding the toxicity of PCB compounds to the blue crab. Information was available on the mud crab, *Rhithropanopeus harrisii*, and the fiddler crabs, *Uca pugilator* and *Uca pugnax*. These values will be used to identify an NOAEL level for the blue crab.

Laughlin et al. (n.d.) found that exposure to 80 ppb Aroclor 1016 was lethal to mud crab larvae, with only 10% surviving to the megalopa stage. At the 40 and 80 ppb levels, the length of the larval stage of development was found to be significantly longer than that observed in the control (0 ppb) and 20 ppb treatments. Likewise, megalopal size (the stage following the larval stage) was significantly smaller, and frequency of developmental abnormalities higher, than those observed in the 0 or 20 ppb treatments.

Vernberg et al. (1977) exposed fiddler crab, larva, and adults to Aroclor 1016 and 1254 at concentrations from 0.1 to 500 ppb. The 96 hour LC50 for Aroclor 1254 was determined to be approximately 10 ppb for fiddler crab larvae. Concentrations from 0.1 to 1 ppb had no discernible effect on larval mortality after 96 hours of exposure. A similar test assessed toxic effects over time, and found that both Aroclor 1016 and 1254 were chronically toxic to the crab larvae at a concentration of 5 ppb. Adult fiddler crab survival was not affected during a 3 week exposure to 100 ppb Aroclor 1254.

Fingerman and Fingerman (1977) found that exposure of fiddler crabs to 8 ppb Aroclor 1254 induced inhibition of molting. In a similar study, Fingerman and Fingerman (1978) found that fiddler crabs exposed to 2 to 8 ppb of Aroclor 1242 were unable to change color, indicating a negative effect on melanin-dispersing neuroendocrine cells.

Fiddler crab

Vernberg et al. (1977) exposed fiddler crab, larva, and adults to Aroclor 1016 and 1254 at concentrations from 0.1 to 500 ppb. The 96 hour LC50 for Aroclor 1254 was determined to be approximately 10 ppb. Concentrations from 0.1 to 1 ppb had no discernible effect on mortality after 96 hours of exposure. A similar test assessed toxic effects over time, and found that both Aroclor 1016 and 1254 were chronically toxic to the crabs at a concentration of 5 ppb. Adult fiddler crab survival was not affected during a 3 week exposure to 100 ppb Aroclor 1254.

Fingerman and Fingerman (1977) found that exposure of fiddler crabs to 8 ppb Aroclor 1254 induced inhibition of molting. In a similar study, Fingerman and Fingerman, 1978 found that fiddler crabs exposed to 2 to 8 ppb of Aroclor 1242 were unable to change color, indicating a negative effect on melanin-dispersing neuroendocrine cells.

Brown shrimp

Smith and Johnston (1992) exposed the common shrimp, *Crangon crangon* to sub-acute concentrations of PCB 15 and PCB 77, ranging from 0.05 ug/L to 50 ug/L. Mortality, hemolymph volume, hemocyte counts, plasma protein, hemolymph osmolarity, and hemolymph cell prophenoloxidase levels were determined for the shrimp across the concentration levels. Mortality was not significantly influenced by increasing concentrations of PCB 77, however mortality was markedly higher in the 50 ug/L PCB 15 treatments after 96 hours of exposure. Recovered hemolymph volume was significantly higher for both PCB compounds at the 0.5 ug/L level. Mean hemolymph count was significantly depressed at PCB 15 levels as low as 0.5 ug/L. Phenoloxidase activities tended to decrease as PCB concentration increased. There were no observable effects of either PCB compound on plasma protein and hemolymph osmolarity.

Ernst (1984) and EPA (1980) report LC50 values for several species of shrimp. The 96 hour LC50 for grass shrimp, *Palaemonetes pugio* exposed to Aroclor 1254 and 1016 was 6.1-7.8 and 12.5 ug/L respectively. The 96 hour LC50 for brown shrimp, *Penaeus aztecus*, exposed to Aroclor 1016 was reported as 10.5 ug/L. The 12 day LC50 for pink shrimp, *Penaeus duorarum*, exposed to Aroclor 1254 was reported as 1.0 ug/L (Eisler 1986).

References

Aulerich, R.J. and R.K. Ringer. 1977. "Current Status of PCB Toxicity to Mink, and Effect on Their Reproduction." *Arch. Environ. Contam. Toxicol.*, 6 279-292

Bergeron, J.M., D. Crews, and J.A. McLachlan. 1994. "PCBs as Environmental Estrogens: Turtle Sex Determination as a Biomarker of Environmental Contamination." *Environmental Health Perspectives* 102(9): 780-781.

Bird, D.M., P.H. Tucker, G.A. fox, and P.C. Lague. 1983. "Synergistic Effects of Aroclor 1254 and Mirex on the Semen Characteristics of American Kestrels." *Arch. Environ. Contam. Toxicol.* 12:633-640.

Bishop, C.A., R.J. Brooks, J.H. Carey, P. Ng, R.J. Norstrom, and D.R.S. Lean. 1991. "The Case for a Cause-Effect Linkage Between Environmental Contamination and Development in Eggs of the Common Snapping Turtle (*Chelydra s. serpentina*) from Ontario, Canada." *Journal of Toxicology and Environmental Health* 33: 521-547.

Chou, S.F. and R.A. Griffin. 1986. "Solubility and Soil Monbility of Polychlorinated Biphenyls." pp 101-120. In *PCBs* *and the Environment, Vol. I.* J.S. Waid, Ed. CRC Press, Boca Raton, Florida. 228 pp.

Dunning, J.B. 1993. *Avian Body Masses*. CRC Press. Boca Raton.

Eisler, R. 1986. "Polychlorinated Biphenyl Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review." *U.S. Fish Wildl. Serv. Biol. Rep.* 85(1.7). 72 pp.

U.S. Environmental Protection Agency (U.S. EPA). 1980. "Ambient Water Quality Criteris for Polychlorinated Biphenyls." *U.S. Environmental Protection. Agency Rep.* 440/5-80-068. 211 pp.

Ernst, W. 1984. "Pesticides and Technical Organic Chemicals." Pages 1617-1709 in O. Kinne (ed.). *Marine Ecology.* Vol V, Part 4. John Wiley, New York.

Fingerman, S.W, and L.C. Russell. 1980. "Effects of the Polychlorinated Biphenyl Aroclor 1242 on Locomotor Activity and on the Neurotransmitters Dopamine and Norepinephrine in the Brain of the Gulf Killifish, *Fundulus grandis*." *Bulletin of Environmental Contamination and Toxicology* 25: 682-687.

Fingerman S.W. and M. Fingerman. 1977. Effects of a polychlorinated biphenyl and a polychlorinated dibenzofuran on molting of the fiddler crab, *Uca pugilator*. Bull. Environ.Contam.Toxicol. 18(2);138-142.

Fingerman S.W. and M. Fingerman. 1978. Influence of the polychlorinated biphenyl preparation Aroclor 1242 on color changes of the fiddler crab *Uca pugilator*. Marine Biology. 50;37-45.

Geisy, J.P., J.P. Ludwig, D.E. Tillitt. 1994. "Dioxins, dibenzofurans, PCBs, and Similar Chlorinated Diaromatic Hydrocarbons and Their Effects on Birds: Wildlife Biomonitoring for Hazards of Complex Environmental Mixtures in the Laurentian Great Lakes." In Press. In: Heaton, S.N., S.J. Bursian, J.P. Giesy,

Heath, R.G., J.W. Spann, F.F. Leatherland, and P.M. Stokes. 1972. "Comparative Dietary Toxicities of Pesticides to Birds." *U.S. Fish and Wildlife Service Special Scientific Report* - 152. Washington, D.C.

Heaton, S.N., S.J. Bursian, J.P. Giesy, D.E. Tillitt, J.A. Render, P.D. Jones, D.A. Verbrugge, T.J. Kubiak, and R.J Aulerich. 1995. "Dietary Exposure of Mink to Carp from Saginaw Bay, Michigan. 1. Effects on Reproduction and Survival, and the Potential Risks to Wild Mink Populations." *Arch. Environ. Contam. Toxicol.*, 28:334-343.

Iwata, Y., F.A. Gunther, and W.S. Westlake. 1974. "Uptake of a PCB (Aroclor 1254) from Soil by Carrots under Field Condictions." *Bull. Environ. Contam. Toxicol.* 11:523-528.

Iwata, Y. And F.A. Gunther. 1976. "Translocation of the Polychlorinated Biphenyl Aroclor 1254 from Soil into Carrots under Field Conditions." *Arch. Environ. Contam. Toxicol.* 4:44-59.

Kenaga, E.E. 1973. Factors to be considered in the evaluation of the toxicity of pesticides to birds in their environment. Pages 166-181 in . Environmental quality and safety, global aspects of chemistry, toxicology and technology as applied to the environment. Vol. II Coulston, F. And F. Korte, eds. Academic Press, Inc. New York.

Laughlin, R.B. Jr., J.M. Neff, and C.S. Giam. n.d. Effects of polychlorinated biphenyls, polychlorinated naphthalenes, and phthalate esters on larval development of the mud crab *Rhithropanopeus harrisii*. n.p.

Mahanty, H.K. 1973. "A study on the Effects of Polychlorinated Biphenyl (Arolcor 1242) on an Aquatic Plant - Spirodela oligorrhiza (Kurz) Helm." *Bull. Environ. Contam. Toxicol.* 14:558.

Mason, C.F. 1993. Regional trends in PCB and pesticide contamination in northern Britain as determined in otter (Lutra

lutra) scats. Chemosphere. 26(5);941-944.

Mason, C. F. And J.R. Ratford. 1994. PCB congeners in tissues of European otter (Lutra lutra). Bull. Environ. Contam. Toxicol. 53;548-554.

Moza, P.I., W. Klein, and F. Korte. 1974. "Metabolism of 2-2'dichlorobiphenyl-^{14}C in Two Plant-Water-Soil Systems. Bull. Environ. Contam. Toxicol. 12(5):541

Nygard, T. 1983. "Pesticide residues and Shell Thinning in Eggs of Peregrines in Norway." *Ornis Scand.* 161-166.

Platanow, N.S. and L.H. Karstad. 1973. "Dietary Effects of Polychlorinated Biphenyls on Mink." *Can. J. Comp. Med.*, 37:391-400.

Peakall, D.B. 1975. "PCBS and Their Environmental Effects." *CRC Critical Rev. Environ. Control.* 5:469-508.

Peakall, D.B. and M.L. Peakall. 1973. Effect of a polychlorinated biphenyl on the reproduction of artifically and naturally incubated dove eggs. J. Appl. Ecol. 10:863-868.

Smith, V.J. and P.A. Johnston. 1992. Differential haemotoxic effect of PCB congeners in the common shrimp *Crangon crangon*. Comp. Biochem. Physiol. 101C(3);641-649.

Stotz, I.J. and Y.A. Greichus. 1978. "The Effects of a Polychlorinated Biphenyl Aroclor 1254 on the White Pelican: Ultrastructure of Hepatocytes." *Bull. Environ. Contam. Toxicol.* 19(3):319-325.

Strek, H.J. and J.B. Weber. 1982. "Behavior of polychlorinated Biphenyl s (PCBs) in Soils and Plants." *Environmental Pollution (Series A).* 28:291-312.

Tanabe, S. 1988. "PCB Probelsm in the Future: Foresight from Current Knowledge." *Environ. Pollut.* 50:5-28.

Tillitt, D.E., J.A. Render, P.D. Jones. D.A. Verbrugge, T.J. Kubiak, and R.J. Aulerich. 1995. "Dietary Exposure of Mink to Carp from Saginaw Bay, Michigan. 1. Effects on Reproduction and Survival, and the Potential Risks to Wild Mink Populations." *Arch. Environ. Contam. Toxicol.*, 28:334-343.

Ullstrand, S. And A. Södergren. 1971. Effect of PCB on nocturnal activity in caged robins, Erithacus rubecula L. Nature. 231:467

Vernberg, F.J., M.S. Guram, and A Savory. 1977. Survival of larval and adult fiddler crabs exposed to Aroclor 1016 and 1254 and different temperature-salinity combinations. Pp 37-50 In: Vernberg, F.J., A. Calabrease, F.P. Thurberg, and W.B. Vernberg (eds.). Physiological Responses of Marine Biota to Pollutants. Academic Press. New York.

Weber, J.B. and E. Mrozek. 1979. "Polychlorinated Biphenyls: Absorbtion and Translocation by Plants, and inactivation by Activated Carbon." *Bull. Environ. Contam. Toxicol.* 23:412-417.

Wren, C.D., D.B. Hunter, J.F. Leatherland, and P.M. Stokes. 1987b. "The Effects of Polychlorinated Biphenyls and Methylmercury, Singly and in Combination on Mink. II. Reproduction and Kit Development." *Arch. Environ. Contam. Toxicol.*, 16:449-454

Wren, C.D., D.B. Hunter, J.F. Leatherland, and P.M. Stokes. 1987a. "The Effects of Polychlorinated Biphenyls and Methylmercury, Singly and in Combination on Mink. I. Uptake and Toxic Responses." *Arch. Environ. Contam. Toxicol.*, 16:441-447

Yawetz, A., I. Sidis, and A. Gasith. 1983. "Metabolism of Parathion and Brain Cholinesterase Inhibition in Aroclor

1254-Treated and Untreated Caspian Terrapin (*Mauremys caspica rivulata,* Emydidae, Chelonia) in Comparison with Two Species of Wild Birds." *Comp. Biochem. Physiol.* 75C:377-382.

TABLE C-1. LOAEL, NOAEL, and Acute Values for PCBs used in the Hazard Quotient Calculations
LCP Site
Brunswick, GA
April 1997

Species	Acute (mg/kg)	LOAEL (mg/kg)	NOAEL (mg/kg)
Wood stork	20.0	2	0.02
Marsh wren	2.8	0.28	0.028
Clapper rail	2.8	0.28	0.028
Diamondback terrapin	32.3	3.23	0.32
River otter	3.3	0.13	0.10
West Indian manatee	3.3	0.13	0.10
Raccoon	3.3	0.13	0.10

Appendix D
Effects Profile for Mercury
LCP Site
Brunswick, GA
April 1997

Mercury

Wood Stork

Several studies were located that evaluated dietary Hg exposure to predatory birds, both raptors and piscivorous species. Several laboratory feeding studies conducted on goshawks (*Astur palumbaris*) and red-tailed hawks (*Buteo jamaicensis*) indicate that these species accumulated Hg and exhibited toxicity symptoms when fed prey containing elevated Hg levels. A field study conducted on the common loon (*Gavia immer*) also indicated that this species exhibits toxicity symptoms after ingesting prey with elevated Hg levels.

Goshawks (*Astur palumbaris*) were fed a diet of chickens which had been fed methyl mercury-dressed wheat (0.4 - 0.5 mg/kg/day) for five to six weeks and both chickens and goshawks were sacrificed (Borg et al. 1970). All chickens were clinically healthy at the end of the feeding period. Average Hg levels in the chicken feed was 8 mg/kg, resulting in skeletal muscle concentrations of 10 mg/kg. Muscle and liver from the chickens was fed to goshawks. Intake of Hg by the goshawks was 0.7 - 1.2 mg/kg/day. Clinical symptoms of Hg poisoning appeared after two weeks. All birds were dead 47 days after the start of the experiment. Muscle Hg levels of the goshawks averaged 40 - 50 mg/kg, representing a concentration factor of 4 to 5 in the second link of the food chain. Brain Hg levels in the dead goshawks ranged from 30 to 40 mg/kg.

Red-tailed hawks (*Buteo jamaicensis*) were fed chickens contaminated with methyl Hg (Fimreite and Karstad 1971). The chickens were fed diets containing Panogen 15, a commercial seed treatment containing 2.5 percent methyl mercury dicyandiamide (MMD) at rates of 6, 12 and 18 mg/kg MMD for three weeks. Mercury levels measured in chick livers were 3.9, 7.2 and 10.0 mg/kg, respectively. Mean estimated intake of Hg by the three groups of hawks over the 12 week exposure period was 0.575 mg Hg/day, 1.12 mg Hg/day, and 1.46 mg Hg/day. Mortality occurred in hawks receiving the most contaminated diet (1.12 mg/kg/day) after an exposure period of one month or more. Pathological changes noted in all hawks which received the highest Hg doses included swelling of axons of myelinated nerves in the spinal cord, and dilatation of myelin sheaths and loss of myelin.

Barr (1986) noted decreased reproductive success and behavioral changes in common loons (*Gavia immer*) nesting on the Wabigoon-English River systems, areas affected by unpredictable water level fluctuations and Hg contamination. Decreased reproductive success due to water level fluctuations due to dams was ruled out as the cause, as the decreased reproductive success was observed in lakes experiencing only natural water level changes as well as in areas affected by dams. A strong negative correlation was found between the successful use of territories by breeding loons and Hg contamination. A reduction in egg laying, and nest site and territorial fidelity, were associated with mean Hg concentrations ranging from 0.3 to 0.4 mg/kg in prey (equivalent to 0.1 mg/kg body weight/day), and from 2 to 3 mg/kg in adult brain tissue and eggs. Loons established few territories, laid only one egg, and raised no young where mean Hg in prey species exceeded 0.4 mg/kg. Non-mercury toxicants were found in loons and prey items at low levels, and were therefore discounted as a major factor in the failure of loon reproduction.

Wood stork feed through the use of tactile response and exceptionally fast reflex action. Therefore, subtle behavioral and/or neurological effects could have substantial impacts on individual wood storks feeding at this site.

For the purposes of this risk assessment a LOAEL of 0.1 mg/kg/day (Barr 1986) will be used in the hazard quotient calculations. A NOAEL of 0.01 mg/kg/day was calculated by dividing the LOAEL by a factor of 10. An acute value of 1.12 mg/kg/day (Fimreite and Karstad 1971) will be used in the risk calculations (Table D-1).

Marsh wren and clapper rail

No dietary toxicity studies were located that had been conducted with marsh wren or clapper rail. However, two were found that had been conducted with passerine species.

Effects of dietary methyl mercury on zebra finches (seed eaters) were evaluated by Scheuhammer (1988). Four groups of birds were fed diets containing 0, 1.0, 2.5 or 5.0 μg/g methyl mercury. A dietary level of 5 μg/g caused significant neurological impairment and death in zebra finches. No symptoms were noted in the group fed levels of 2.5 μg/g.

Kidney lesions were found in juvenile starlings (*Sturnus vulgaris*; omnivores) that consumed a commercial diet contaminated with 1.1 mg/kg mercury (0.12 mg/kg/day; Nicholson and Osborn 1984).

For the purposes of this risk assessment, a LOAEL of 0.12 mg/kg/day was used in the hazard quotient calculations. This value was converted to an acute value by multiplying by a facter of 10, and converted to a NOAEL by dividing by a factor of 10.

Raccoon

No studies were found that evaluated the effects of mercury on raccoons. Information was available on the effects of mercury to cats. These values will be used as a LOAEL for the raccoon.

Albanus et al. (1972) fed cats a diet composed of pike collected in a mercury-contaminated lake in Sweden. The cats were fed approximately 0.45 mg/kg/day. Behavioral changes such as aggressiveness and stiff, waddling gaits were noted 4 to 11 days before the onset of convulsions, which developed between 60 and 73 days after the start of the experiment.

Two groups of cats were tested by Eaton et al. (1980). One group was fed ringed seal liver which contained an average of 26.2 μg/g Hg. Only 3 percent of the Hg in the seal liver was in the organic form (CH_3Hg). Another group was fed beef liver spiked with methyl mercuric chloride (CH_3HgCl), at a dose of 0.25 mg/kg/day. Evidence of Hg intoxication appeared only in the group of cats fed beef liver. Animals began showing convulsions after 68 days, and mean survival period for the animals was 78 days.

Pregnant female cats were dosed with CH_3HgCl administered in corn oil suspensions in gelatin capsules, days 10 - 58 of gestation (Khera 1973). At oral levels of 0.25 mg/kg/day, there was an increased incidence of abortion, fetal anomalies, and decreased cell density in the external granular layer of the cerebellum.

Cats fed diets containing methyl mercury at levels of 0.25 mg/kg/day showed clinical signs of toxicity after 55 - 96 days of exposure (Charbonneau et al. 1974).

For the purposes of this risk assessment, a value of 0.25 mg/kg/day will be used as a LOAEL to raccoon. This value was converted to a NOAEL by dividing by a factor of 10, and converted to an acute value by multiplying by a factor of 10 (Table D-1).

River otter

Several studies were found that evaluated the effects of mercury on mink, and one study was found that evaluated the effects of mercury on river otters (both Order *Mustelidae*). All studies are summarized below, as none were without methodological problems.

A commercial mink diet containing 5 μg/g CH_3Hg (0.75 mg/kg/day)[1] was lethal to adult mink in 30 days, while mink fed 10 μg/g inorganic mercuric chloride showed no adverse effects on survival or reproduction after five months (Auerlich et al. 1974).

Adult female mink were fed commercial diets containing 1.1, 1.8, 4.8, 8.3 and 15.0 μg/g Hg as methyl mercuric chloride

[1] Calculated based on average mink body weight of 1 kg (Linscombe et al. 1982) and ingestion rate of 150 g/day (Auerlich et al. 1973).

for a 93-day period (Wobeser et al. 1976). Signs of mercury intoxication were seen in mink fed 1.8 $\mu g/g$ CH_3HgCl (0.27 mg/kg/day)[2] and greater. Signs of intoxication were anorexia, weight loss, ataxia, splaying of the hind legs, irregular vocalization and convulsions. The rapidity of the onset of clinical intoxication was directly related to the mercury content of the diet. Mercury levels in tissues of animals which died were similar, despite differences in dietary intake levels and times of death. Mean concentration of mercury (ppm) in tissues of mink which died were as follows: brain, 11.9; muscle, 16.0; kidney, 23.1; and liver, 24.3.

In contrast, Jernalov et al. (1976) fed adult female mink a diet containing mercury-contaminated pike for a 100 day period. The concentration of CH_3Hg in the pike was 5.7 mg/kg, and pike comprised 40 percent of the total diet by weight. Based on an average mink body weight of 1 kg and ingestion rate of 0.15 kg/day, the mink were exposed to a dietary level of 0.35 mg/kg/day. The mink showed no symptoms of poisoning, and their behavior was unchanged throughout the experimental period.

It is difficult to determine the reason for the apparent discrepancy in levels of mercury which produced toxic effects in the above three studies. Actual mercury concentration in the diet was not analyzed in the first two studies, and only the pike portion of the diet was analyzed by Jernalov et al. (1976). The portion of diet comprised by fish differed in all three studies, and selenium levels were only analyzed by Jernalov et al. (1976). Fish tissue is generally high in selenium, which protects organisms from mercury toxicity (Cuvin-Aralar and Furness 1991, Stoewsand et al. 1974), and also reduces assimilation of mercury from food by 5 - 10 percent (Turner and Swick 1983).

Methyl mercury was added to diets of male river otters at levels of 2, 4, and 8 ppm mercury (0.25, 0.50 and 1.00 mg/kg/day, respectively; O'Conner and Nielson 1980)[3]. Control animals were healthy for the entire study period, but otters exposed to mercury in the diet had mean survival times of 184, 117 and 57 days, respectively. Tissue concentrations at time of death were similar, although dietary levels differed. It was noted that the otter's sensitivity to dietary methyl mercury is comparable to that of dogs and cats

For the purposes of this risk assessment, a LOAEL of 0.25 mg/kg/day was used in the hazard quotient calculations. This value was converted to an acute value by multiplying by a factor of 10 and to a NOAEL by dividing by a factor of 10 (Table D-1)

Manatee

No studies were located which determined the toxicity of mercury to manatee. However, several articles were found which determined the toxicity of mercury to horses. Because both the manatee and the horse eat vegetation, it is appropriate to use a LOAEL located for the horse. Guglick et al. (1995) that mercury toxicosis was caused by the ingestion of an inorganic mercuric blistering agent that had been applied for topical treatment of dorsal metacarpal disease. Signs of depression, dependent edema, pollakiuria, nonproductive cough, and oral ulceration were noticed and the mercury content of blood and urine was high.

In a similar study, Roberts et al. (1982) noted chronic mercuric chloride intoxication in an aged horse given 0.8 mg Hg/kg/day for 14 weeks. Renal function changes included heavy glycosuria, modest proteinuria, phosphaturia, reduced urine osmolality, gradually increasing urine production, reduced glomerular filtration rate, and terminally, azotemia.

For the purposes of this risk assessment, a LOAEL of 0.8 mg/kg/day and an acute dose of 8.0 mg/kg/day will be used in the calculation of risk to manatee. A NOAEL was calculated by dividing the LOAEL by a factor of 10 (Table D-1).

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[2] Ibid

[3] Dose in mg/kg/day calculated based on an average adult otter bodyweight of 6.35 kg and ingestion rate of 800 g/day (Harris 1968)

Diamondback terrapin

Few studies have been conducted to assess effects of contaminants on reptiles. The majority of literature which is available presents contaminant levels in tissues of organisms found dieing or dead (Hall 1980). No studies were found that present dietary levels of mercury shown to cause toxic effects in reptiles.

Juvenile alligators were exposed to a single dose of 5 mg/kg methyl-mercury chloride/day by gavage (Peters 1983) to evaluate mercury accumulation in alligator tissue. Animals were sacrificed after 13 weeks, and significant accumulation of mercury was noted. The highest mercury concentration was noted in gonadal tissue. No clinical or gross pathological effects were observed, however histopathological analysis was not conducted.

For the purposes of this risk assessment, 5 mg/kg/day will be used as a LOAEL. This value was converted to an acute value by multiplying by a factor of 10 and to a NOAEL by dividing by a factor of 10 (Table D-1).

The discussion presented below is for informational purposes only and is not used in the hazard quotient calculations.

Killifish

Lee et al. (1992) reported 100 percent mortality in mosquitofish exposed to $HgCl_2$ solution at an average concentration of 1.0 g/L. In the first experiment, Hg concentration averaged 0.93 mg/L for the first four days, and no mortality was noted. The concentration was increased to 1.12 mg/L for the next six days, and all fish in the experimental chambers died. During the second experiment, mercury concentrations averaged 1.05 mg/L for the duration of the experiment.

An LC_{50} of 500 μg/L CH_3HgCl was reported for mosquitofish (Boudou et al. 1979). The exposure period was less than 24 hours.

Comparative toxicity of $HgCl_2$ and CH_3HgCl was investigated using several freshwater species, one of which was mosquito fish, *Gambusia affinis* (Paulose 1988). Ninety-six hour LC_{50}s measured during static toxicity tests were 230 and 90 μg/L for the inorganic and organic forms of mercury, respectively.

Shrimp (Based on Crayfish)

Ninety-six hour static toxicity tests were conducted with the crayfish, *Orconectes limosus* (Doyle et al. 1976). Ninety three percent survival was observed in crayfish exposed to mercuric chloride at 0.25 mg/L, but only 60 percent survival was noted at an exposure level of 1.00 mg/L.

Heit and Fingerman (1977) reported a 96-hour LC_{50} of 10 μg/L for the crayfish, *Faxonella clypeatus* less than 35 cm carapace length. An exposure period of 28 days was required for mortality to reach 50 percent in animals between 35 and 40 cm carapace length.

Fiddler Crab

Several studies were located which determined the effects of mercury contamination to fiddler crab. Callahan and Weis (1983) studied the effects of methylmercury on regeneration and ecdysis in fiddler crabs after acute and chronic pre-exposure periods. Methylmercury was found to inhibit limb regeneration and molting in fiddler crabs at levels as low as 0.5 ug/ml. Devi and Rao (1989) noticed a decreased oxygen consumption rate in adult fiddler crabs exposed for 96 hours to inorganic mercury levels as low as 0.014 ppm.

Blue Crab

No information could be found regarding the toxicity of mercury to the blue crab. Information was available on the mud crab, *Rhithropanopeus harrisii*, and the fiddler crabs, *Uca pugilator, Uca pugnax, Uca annulipes,* and *Uca* *triangularis*. These values will be used to identify an NOAEL level for the blue crab.

Callahan and Weis (1983) studied the effects of methylmercury on regeneration and ecdysis in fiddler crabs after acute and chronic pre-exposure periods. Methylmercury was found to inhibit limb regeneration and molting in fiddler crabs at levels as low as 0.5 ug/ml. Devi and Rao (1989) noticed a decreased oxygen consumption rate in adult fiddler crabs exposed for 96 hours to inorganic mercury levels as low as 0.014 ppm.

Literature Cited

Albanus, L., L. Frankenberg, C. Grant, U. von Haariman, A. Jemelov, G. Nordberg, M. Rydaiv,A.Schutz, and S. Skerfving. 1972. "Toxicity for Cats of Methylmercury in Contaminated Fish from Swedish Lakes and of Methylmercury Hydroxide Added to Fish." *Environmental Reseasrch,* 5:425-442.

Aulerich, R. J., R. K. Ringer, and J. Iwamoto. 1974. "Effects of Dietary Mercury on Mink." *Archives of Environmental Contamination and Toxicology,* 2:43-51.

Barr, J. F. 1986. "Population Dynamics of the Common Loon *(Gavia immer)* Associated with Mercury-Contaminated Waters in Northwestern Ontario." *Can. Wildl. Serv. Occas. Pap.* No. 56, 23 pp.

Borg, K., K. Eme, E. Hanko, and H. Wanntorp. 1970. "Experimental Secondary Methylmercury Poisoning in the Goshawk *(Accipiter g. gentiles* L.)." *Environmental Pollution,* 1:91-104.

Boudou, A., D.Georgescauld, and J.P. Desmazes. 1983. "Ecotoxicological Role of the Membrane Barriers in Transport and Bioaccumulation of Mercury Compounds." Pages 117-136. In J.O. Nriagu (ed.). *Aquatic Toxicology*, John Wiley. New York.

Callahan, P. And J.S. Weis. 1983. "Methylmercury Effects on Regeneration and Ecdysis in Fiddler Crabs (*Uca pugilator, U. pugnax*) After Short-term and Chronic Pre-exposure." *Archives of Environmental Contamination and Toxicology*,12:707-714.

Devi, V.U. and Y.P. Rao. 1989. "Heavy Metal Toxicity to Fiddler Crabs, *Uca annulipes* Latieille and *Uca triangularis* (Milne Edwards): Respiration on Exposure to Copper, Mercury, Cadmium, and Zinc." *Bulletin ofEnvironmental Contamination and Toxicology,* 43:165-172.

Eaton, R. D. P., D. C. Secord, and P. Hewitt. 1980. "An Experimental Assessment of the Toxic Potential of Mercury in Ringed Seal Liver for Adult Laboratory Cats." *Toxicology and Applied Pharmacology,* 55:514-521.

Fimreite, N., and L. Karstad. 1971. "Effects of Dietary Methylmercury on Red-Tailed Hawks." *Journal of Wildlife Managment,* 35:293-300.

Hall, R.J. 1980. "Effects of Environmental Contaminants on Reptiles: A Review." *U.S. Fish and Wildlife Service Special Science Report - Wildlife* 228:1-12.

Khera, K.S. 1979. "Teratogenic and Genetic Effects of Mercury Toxicity." Pages 501-518 in J.O. Nriagu (ed.). *The Biogeochemistry of Mercury in the Environment.* Elsevier/North Holland Biomedical Press, New York.

Lee et al 1992 (killifish)

Nicholson, J.K. and D. Osburn. 1984. "Kidney Lesions in Juvenile Starlings *Sturnus vulgaris* Fed on a Mercury Contamianted Diet." *Environ. Pollut.* 33A:195-206.

Palouse 1988

Wobeser, G. and M. Swift. 1976. "Mercury Poisoning in a Wild Mink." *J. Wildl. Dis.* 12:335-340.

Wren, C. D. 1985. "Probable Case of Mercury Poisoning in a Wild Otter, *Lutra canadensis,* in Northwestern Ontario." *Can. Field Nat.* 99:112-114.

TABLE D-1. LOAEL, NOAEL, and Acute Values for Mercury used in the Hazard Quotient Calculations
LCP Site
Brunswick, GA
April 1997

Species	Acute (mg/kg)	LOAEL (mg/kg)	NOAEL (mg/kg)
Wood stork	1.12	0.10	0.01
Marsh wren	1.2	0.12	0.012
Clapper rail	1.2	0.12	0.012
Diamondback terrapin	50.0	5.0	0.5
River otter	2.5	0.25	0.025
West Indian manatee	8.0	0.8	0.08
Raccoon	2.5	0.25	0.025

Appendix E
Analytical Report for Samples Collected in May 1995
LCP Site
Brunswick, GA
April 1997

ANALYTICAL REPORT

Prepared by
Roy F. Weston, Inc.

LCP Chemical Site
Brunswick, GA

July, 1995

EPA Work Assignment No. 0-113
WESTON Work Order No. 03347-040-001-0113-01
EPA Contract No. 68-C4-0022

Submitted to
M. Sprenger
EPA-ERT

M. Huston Task Leader	Date
V. Kansal Analytical Section Leader	7/28/95 Date
R. Shapot Project Manager	Date

Analysis by:
REAC
Aqua Survey\Battelle
Marine Sciences Lab

Prepared by:
G. Karustis

Reviewed by:
G. Armstrong

0113\DEL\AR\9507\REPORT

Table of Contents

Appendices will be furnished on request.

INTRODUCTION

REAC, in response to ERT WA # 0-113, provided analytical support for water, sediment and tissue samples collected at the LCP Chemical Site in Brunswick, GA. This support involved the analysis of water, sediment and tissue samples and the subcontracted analyses of sediment samples as described in the following table. The support also included QA/QC, data review and the preparation of a report summarizing the analytical methods, results, and the QA/QC results.

The samples were treated with procedures consistent with those described in SOP #1008 and are summarized in the following table:

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
00110	7	5/21/95	5/23/95	Water	PCB	REAC
00112	1	5/21/95	5/23/95	Water	PCB	REAC
00112	8	5/21/95	5/23/95	Water	TAL Metals	REAC
00112	4	5/21/95	5/23/95	Sediment	PAH, TPH PCB, TAL Metals	REAC
00118	5	5/23/95	5/25/95	Sediment	Pet HC, TAL Metals, PCB, PAH, TOC	REAC
00118	5	5/21/95	5/25/95	Water	TAL Filtered	REAC
00119	3	5/21/95	5/25/95	Water	TAL Metals	REAC
00119	2	5/19/95	5/25/95	Water	TAL Metals	REAC
00119	1	5/20/95	5/25/95	Sediment	TAL Metals, Pet HC, PAH	REAC
00120	5	5/23/95	5/24/95	Sediment	TOC	Aqua Survey
00142	2	5/17/95	5/20/95	Sediment	TAL Metals, PCB, PAH, Pet HC	REAC
00142	2	5/18/95	5/20/95	Sediment	TAL Metals, PCB, PAH, Pet HC	REAC
00142	1	5/19/95	5/20/95	Sediment	TAL Metals, PCB, PAH, Pet HC	REAC

* COC # denotes Chain of Custody number

Sample Table (Cont)

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
00573	8	5/23/95	5/31/95	Edible Shrimp	Total Mercury PCB, % Solids % Lipids	REAC
00573	6	5/23/95	5/31/95	Inedible Shrimp	Total Mercury PCB, % Solids % Lipids	REAC
00574	5	5/23/95	5/31/95	Edible Shrimp	Total Mercury PCB, % Solids % Lipids	REAC
00574	4	5/23/95	5/31/95	Inedible Shrimp	Total Mercury PCB, % Solids % Lipids	REAC
00575	3	5/23/95	5/31/95	Inedible Shrimp	Total Mercury PCB, % Solids % Lipids	REAC
00575	7	5/23/95	5/31/95	Edible Blue Crab	Total Mercury PCB, % Solids % Lipids	REAC
00575	6	5/23/95	5/31/95	Inedible Blue Crab	Total Mercury PCB, % Solids % Lipids	REAC
00576	6	5/23/95	5/31/95	Edible Blue Crab	Total Mercury PCB, % Solids % Lipids	REAC
00576	3	5/23/95	5/31/95	Inedible Blue Crab	Total Mercury PCB, % Solids % Lipids	REAC
005[illegible]	5	5/16/95	5/25/95	Sediment	Hg, Pb	REAC
005[illegible]	3	5/18/95	5/25/95	Sediment	Hg, Pb	REAC
005[illegible]	2	5/19/95	5/25/95	Sediment	Hg, Pb	REAC

* COC # denotes Chain of Custody number

Sample Table (Cont)

COC #**	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
7443	1	5/17/95	5/19/95	Sediment	TOC	Aqua Survey
7443	3	5/18/95	5/19/95	Sediment	TOC	Aqua Survey
7443	1	5/19/95	5/19/95	Sediment	TOC	Aqua Survey
8272	1	5/20/95	5/22/95	Sediment	TOC	Aqua Survey
8272	4	5/21/95	5/22/95	Sediment	TOC	Aqua Survey
9580	5	5/18/95	5/22/95	Edible Shrimp	Total Mercury PCB, % Moisture, % Lipids	REAC
9580	5	5/18/95	5/22/95	Inedible Shrimp	Total Mercury PCB, % Moisture, % Lipids	REAC
9581	1	5/18/95	5/22/95	Spartina Grass	Total Mercury PCB, % Moisture, % Lipids	REAC
9581	2	5/19/95	5/22/95	Spartina Grass	Total Mercury PCB, % Moisture, % Lipids	REAC
9581	1	5/18/95	5/22/95	Fiddler Crab	Total Mercury PCB, % Moisture, % Lipids	REAC
9581	2	5/18/95	5/22/95	Inedible Blue Claw Crab	Total Mercury PCB, % Moisture, % Lipids	REAC
9581	2	5/18/95	5/22/95	Edible Blue Claw Crab	Total Mercury PCB, % Moisture, % Lipids	REAC

** COC # denotes Chain of Custody number

Sample Table (Cont)

COC #**	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
9583	6	5/17/95	5/22/95	Crab	Total Mercury PCB, % Moisture, % Lipids	REAC
9583	1	5/17/95	5/22/95	Turtle Carcass	Total Mercury PCB, % Moisture, % Lipids	REAC
9583	1	5/18/95	5/22/95	Turtle Carcass	Total Mercury PCB, % Moisture, % Lipids	REAC
9583	1	5/17/95	5/22/95	Turtle Liver	Total Mercury PCB, % Moisture, % Lipids	REAC
9583	1	5/18/95	5/22/95	Turtle Liver	Total Mercury PCB, % Moisture, % Lipids	REAC
9583	1	5/17/95	5/22/95	Turtle Brain	Total Mercury PCB, % Moisture, % Lipids	REAC
9583	1	5/18/95	5/22/95	Turtle Brain	Total Mercury PCB, % Moisture, % Lipids	REAC
9583	[illegible]	5/17/95	5/22/95	Fiddler Crab	Total Mercury PCB, % Moisture, % Lipids	REAC
958[illegible]	8	5/17/95	5/22/95	Edible Brown Shrimp	Total Mercury PCB, % Moisture, % Lipids	REAC
958[illegible]	8	5/17/95	5/22/95	Inedible Brown Shrimp	Total Mercury PCB, % Moisture, % Lipids	REAC

** COC # denotes Chain of Custody number

Sample Table (Cont)

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
9585	7	5/19/95	5/25/95	Edible Shrimp	Total Mercury PCB, % Solids % Lipids	REAC
9585	5	5/19/95	5/25/95	Inedible Shrimp	Total Mercury PCB, % Solids % Lipids	REAC
9586	2	5/19/95	5/25/95	Inedible Shrimp	Total Mercury PCB, % Solids % Lipids	REAC
9586	17	5/20/95	5/25/95	Fiddler Crab	Total Mercury PCB, % Solids % Lipids	REAC
9587	4	5/20/95	5/25/95	Fiddler Crab	Total Mercury PCB, % Solids % Lipids	REAC
9587	1	5/22/95	5/25/95	Turtle Liver	Total Mercury PCB, % Solids % Lipids	REAC
9587	2	5/22/95	5/25/95	Turtle Brain	Total Mercury PCB, % Solids % Lipids	REAC
9587	1	5/20/95	5/25/95	Turtle Brain	Total Mercury PCB, % Solids % Lipids	REAC
9587	3	5/22/95	5/25/95	Turtle Body/Carcass	Total Mercury PCB, % Solids % Lipids	REAC
9587	1	5/20/95	5/25/95	Turtle Liver	Total Mercury	REAC

* COC # denotes Chain of Custody number

Sample Table (Cont)

COC #**	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
9587	1	5/20/95	5/25/95	Turtle Body/Carcass	Total Mercury PCB, % Solids % Lipids	REAC
9588	9	5/20/95	5/25/95	Inedible Blue Crab	Total Mercury PCB, % Solids % Lipids	REAC
9588	9	5/20/95	5/25/95	Edible Blue Crab	Total Mercury PCB, % Solids % Lipids	REAC
9590	2	5/18/95	5/25/95	Shrimp	Organic Hg	Battelle Marine Sciences
9590	2	5/19/95	5/25/95	Shrimp	Organic Hg	Battelle Marine Sciences
9590	1	5/20/95	5/25/95	Shrimp Shell	Organic Hg	Battelle Marine Sciences
9590	3	5/22/95	5/25/95	Turtle	Organic Hg	Battelle Marine Sciences
9590	2	5/18/95	5/25/95	Spartina	Organic Hg	Battelle Marine Sciences
9590	1	5/20/95	5/25/95	Snail	Organic Hg	Battelle Marine Sciences
9590	1	5/17/95	5/25/95	Crab	Organic Hg	Battelle Marine Sciences
9590	2	5/19/95	5/25/95	Crab	Organic Hg	Battelle Marine Sciences
9590	1	5/20/95	5/25/95	Crab	Organic Hg	Battelle Marine Sciences

** COC # denotes Chain of Custody number

Sample Table (Cont)

COC #**	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
9600	6	5/20/95	5/26/95	Snail Reference	Total Mercury PCB, % Solids % Lipids	REAC
9600	7	5/20/95	5/26/95	Snail Station #17-18	Total Mercury PCB, % Solids % Lipids	REAC
9600	1	5/22/95	5/31/95	Turtle Egg	Total Mercury PCB, % Solids % Lipids	REAC
9601	6	5/22/95	5/31/95	Turtle Egg	Total Mercury, PCB, % Solid, % Moisture	REAC
9601	1	5/24/95	5/30/95	Dry Ice Blank	Total Mercury	REAC
9601	1	5/25/95	5/30/95	Dry Ice Blank	Total Mercury	REAC
9602	3	5/23/95	5/31/95	Edible Blue Crab	Total Mercury PCB, % Solids % Lipids	REAC
9602	7	5/23/95	5/31/95	Inedible Blue Crab	Total Mercury PCB, % Solids % Lipids	REAC
9602	3	5/23/95	5/31/95	Snail	Total Mercury PCB, % Solids % Lipids	REAC

** COC # denotes Chain of Custody number

CASE NARRATIVE

Creosote Package E 228

The initial calibration run on 6/7/95 exceeded the acceptable QC limits for acenaphthene (30.521%); since this compound was not detected in the samples quantitated by this calibration, the data are not affected.

Because of matrix interference, one internal standard area count differed by more than a factor of two from the area count in the calibration check for samples 1051 A, J 01508 and 1053 A, and two internal standard area counts differed by more than a factor of two from the area counts in the calibration check for samples 1052 A, K 01540, 1055 A and K 24160. Since no compounds were quantified by these internal standards, the data are not affected.

Fourteen out of forty percent recoveries for the surrogates for the MS/MSD pairs exceeded the acceptable QC limits. The data are not affected.

PCB Package E 219

The end of sequence calibration check standard run on 5/24/95 exceeds the acceptable QC limits for Aroclor 1260. The data are not affected because no samples were quantified by this calibration.

Both surrogate recoveries exceeded the acceptable QC limits for the water blank WBLK 052495. The results for this sample should be regarded as estimated.

The percent recoveries of decachlorobiphenyl for all samples were not calculated due to coelution with the last peak of Aroclor 1268. The data are not affected.

The percent recoveries for the MS/MSD pair for sample K 01546 were not calculated for the soil samples because of the high concentration of Aroclor 1268. The data are not affected.

0113\DEL\AR\9507\REPORT

PCB Package E 222

The percent recovery of the surrogate, tetrachloro-m-xylene, exceeds the acceptable QC limits for sample 1053 A. The data are not affected.

The percent recoveries for decachlorobiphenyl were not calculated (except for the blanks) because of coelution with a component of Aroclor 1268. The data are not affected.

The percent recovery of the surrogate, tetrachloro-m-xylene, exceeded the acceptable QC limits for samples AB 1037 MS, AB 1037 MSD and the water blank WBLK 052695. The data are not affected.

PCB Package E 226

If compared to the CLP soil limits, the majority of the recoveries of tetrachloro-m-xylene exceed the advisory QC limits. Because no surrogate QC limits have been established for tissue matrices and because tissue matrices cannot be compared to soils, the data will not be qualified.

PCB Package E 256

Method blank 052695 CL contains 0.003 mg/kg Aroclor 1268. Since the concentration of this analyte in the samples quantitated by this blank are greater than ten times the concentrations in the blank, the data are not affected.

The initial calibration run on 5/17/95, signal 1, and on 6/15/95, signals 1 and 2, exceed the acceptable QC limits for decachlorobiphenyl because of coelution with the last peak in Aroclor 1268. The data are not affected.

The percent recoveries for the surrogate decachlorobiphenyl were not calculated because of coelution with the last peak in Aroclor 1268. The data are not affected.

If compared to the CLP soil limits, the majority of the recoveries of tetrachloro-m-xylene exceed the advisory QC limits. Because no surrogate QC limits have been established for tissue matrices and because tissue matrices cannot be compared to soils, the data will not be qualified.

PCB Package E 259

The data was reviewed and was found to be acceptable.

Samples A 00571, A 00573 and 1002 were not analyzed for PCB because of insufficient sample size.

The end of sequence calibration check run on 6/30/95 exceeds the acceptable QC limits for Aroclor 1260. The data are not affected because the initial calibration check was acceptable.

PCB Package E 264

The data was reviewed and was found to be acceptable.

Mercury Package E 218

The data was reviewed and was found to be acceptable.

Mercury Package E 220

The results for samples A 00571, A 00573 and 1002 are reported on a wet weight basis because there was insufficient sample to determine the percent solids.

Because of insufficient sample to determine the percent solids for sample 1016-07, the average percent solids for samples 1016-01 through 1016-06 was used.

Mercury Package E 223

The data was reviewed and was found to be acceptable.

TAL Metals Package E 224

The data was reviewed and was found to be acceptable.

TAL Metals Package E 227

The data was reviewed and was found to be acceptable.

TAL Metals Package E 235

The method blank contained 20 mg/kg aluminum, 23 mg/kg iron and 3.4 mg/kg zinc. All associated samples contained concentrations of these analytes that were greater than 10 times the concentrations found in the blank. The data are not affected.

TAL Metals Package E 236

The data was reviewed and was found to be acceptable.

Organic Mercury Package E 283

The data was reviewed and was found to be acceptable.

Oil and Grease and Total Petroleum Hydrocarbon Package E 213

The end of sequence continuing calibration check standard run on 6/6/95 exceeded the 10% difference criterion. The data are not affected since the initial continuing calibration check standard in the same sequence was acceptable.

Total Organic Carbon Package E 218

The data was reviewed and was found to be acceptable.

SUMMARY of ABBREVIATIONS

B	The analyte was found in the blank
BFB	Bromofluorobenzene
BPQL	Below the Practical Quantitation Limit
C	Centigrade
D	(Surrogate Table) this value is from a diluted sample and was not calculated (Result Table) this result was obtained from a diluted sample
CLP	Contract Laboratory Protocol
COC	Chain of Custody
CONC	Concentration
CRDL	Contract Required Detection Limit
DFTPP	Decafluorotriphenylphosphine
DL	Detection Limit
E	The value is greater than the highest linear standard and is estimated
EMPC	Estimated maximum possible concentration
J	The value is below the method detection limit and is estimated
HHL	High Hazard Laboratory, Brunswick, GA
IDL	Instrument Detection Limit
ISTD	Internal STanDard
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MI	Matrix Interference
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular Weight
NA	either Not Applicable or Not Available
NC	Not Calculated
NR	Not Requested
NS	Not Spiked
% D	Percent Difference
% REC	Percent Recovery
PQL	Practical Quantitation Limit
PPBV	Parts per billion by volume
QL	Quantitation Limit
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
SIM	Selected Ion Mode
U	Denotes not detected

m^3	cubic meter	kg	kilogram
l(L)	liter	g	gram
dl	deciliter	cg	centigram
ml	milliliter	mg	milligram
ul	microliter	ug	microgram
		ng	nanogram
		pg	picogram

* denotes a value that exceeds the acceptable QC limit

Abbreviations that are specific to a particular table are explained in footnotes on that table

Revision 3/10/95

0113\DEL\AR\9507\REPORT

Analytical Procedure for Creosote Compounds in Sediment (REAC)

Extraction Procedure

Thirty grams of sample was mixed with twenty grams of anhydrous sodium sulfate until a sandy consistency was obtained. The sample was then spiked with a surrogate solution consisting of nitrobenzene-d_5, 2-fluorobiphenyl, terphenyl-d_{14}, phenol-d_5, 2-fluorophenol, and 2,4,6-tribromophenol and immediately placed in a Soxhlet extractor. The extraction was conducted over a period of 16 hours; the solvent mixture used was 1:1 acetone:methylene chloride (v/v). Afterwards, the extract was concentrated to a final volume of 10 mls. Prior to analysis, a 1 ml aliquot was spiked with 20 ul of an internal standards mixture consisting of 1,4-dichlorobenzene-d_4, naphthalene-d_8, acenaphthene-d_{10}, phenanthrene-d_{10}, chrysene-d_{12}, and perylene-d_{12}. The extract was then analyzed by GC/MS using the conditions described below.

Analytical Procedure

An HP 5995C Gas Chromatograph/Mass Spectrometer (GC/MS), equipped with a 7673A autosampler and controlled by an HP-1000 RTE-6/VM computer was used to analyze the samples.

The instrument conditions were:

Column	Restek Rtx-5 (crossbonded SE-54) 30 meter x 0.32mm ID, 0.50 μm film thickness
Injection Temperature	290° C
Transfer Temperature	290° C
Source Temperature	240° C
Analyzer Temperature	240° C
Temperature Program	40°C for 3 min 8° C/min to 295° C hold for 12 min
Splitless Injection	Split time = 1.00 min
Injection Volume	1 μl

The GC/MS system was calibrated using 5 creosote standards at 10, 25, 50, 100, and 150 μg/ml. Before analysis each day, the system was tuned with 50 ng decafluorotriphenylphosphine (DFTPP) and passed a continuing calibration check when analyzing a 50 μg/ml standard mixture in which the responses were evaluated by comparison to the average response of the calibration curve.

The creosote results, based on dry weight, are listed in Table 1.1. The concentration of the detected compounds was calculated using the following equation:

$$C_u = \frac{DF x A_u x I_{is} x V_t}{A_{is} x RF(or RF_{ave}) x V_i x W x D}$$

where

C_u	=	Concentration of target analyte (µg/Kg)
DF	=	Dilution Factor
A_u	=	Area of target analyte
I_{is}	=	Mass of specific internal standard (ng)
V_t	=	Volume of extract (µl)
A_{is}	=	Area of specific internal standard
RF	=	Response Factor (unitless)
RF_{ave}	=	Average Response Factor (unitless)
V_i	=	Volume of extract injected (µl)
W	=	Weight of sample (g)
D	=	Decimal per cent solids

The average Response Factor is used when a sample is associated with an initial calibration curve. The Response Factor is used when a sample is associated with a continuing calibration.

Response Factor calculation:

The response factor (RF) for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_c \ x \ I_{is}}{A_{is} \ x \ I_c}$$

where

RF	=	Response factor for a specific analyte
A_c	=	Area of the analyte in the standard
I_{is}	=	Mass of the specific internal standard
A_{is}	=	Area of the specific internal standard
I_c	=	Mass of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + ... + RF_n}{n}$$

and

n = number of Samples

Revision of 4/10/95

0113\DEL\AR\9507\REPORT

Analytical Procedure for PCBs in Water

Extraction Procedure

One liter of sample was spiked with a surrogate solution consisting of tetrachloro-m-xylene and decachlorobiphenyl, and was extracted three times with 60 ml portions of methylene chloride. The combined extracts were filtered, concentrated to 10 ml, solvent exchanged with 60 ml hexane, and the hexane concentrated to 1.0 ml.

Gas Chromatographic Analysis

The extract was analyzed for PCBs using simultaneous dual column injections. The analysis was done on an HP 5890 GC/ECD system, equipped with an HP 7673A automatic sampler, and controlled with an HP-ChemStation. The following conditions were employed:

First Column	DB-608, 30 meter, 0.53mm fused silica capillary, 0.83 μm film thickness
Injector Temperature	250° C
Detector Temperature	325° C
Temperature Program	150°C for 1 minute 7°C/minto 265°C 18 min at 265°
Second Column	Rtx-1701, 30 meter, 0.53mm fused silica capillary, 0.50 μm film thickness
Injector Temperature	250° C
Detector Temperature	325° C
Temperature Program	150° C for 1 minute 7°C/minto 265°C 18 min at 265°

Quantification was based on the DB-608 column (signal 1), and identity of the analyte was confirmed using the Rtx-1701 column (signal 2). A fingerprint gas chromatogram was run using each of the seven Aroclor mixtures; calibration curves were run only if a particular Aroclor was found in the sample.

The PCB results, listed in Tables 1.2 and 1.4, were calculated from the following formula:

$$C_u = \frac{DF x A_u x V_t}{RF_{ave} x V_i x V_s}$$

where

C_u	=	Concentration of analyte (μg/L)
DF	=	Dilution Factor
A_u	=	Area or peak height
V_t	=	Volume of sample (ml)
RF_{ave}	=	Average response factor
V_i	=	Volume of extract injected (μl)
V_s	=	Sample volume (ml)

Response Factor calculation:

The RF for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_u}{total\ ng\ injected}$$

where

A_u = Area or peak height

and

$$RF_{ave} = \frac{RF_1 + ... + RF_n}{n}$$

where

n = number of samples

Revision 7/11/94

Analytical Procedure for PCBs in Sediment

Extraction Procedure

Thirty grams of sample was spiked with a surrogate solution consisting of tetrachloro-m-xylene and decachlorobiphenyl, 30 g anhydrous sodium sulfate and Soxhlet extracted for 16 hours with 300 ml 1:1 hexane: acetone. The extract was concentrated to 5.0 ml. Acid and sulfur cleanup were performed on the samples.

Gas Chromatographic Analysis

The extract was analyzed for PCBs using simultaneous dual column injections. The analysis was done on an HP 5890 GC/ECD system, equipped with an HP 7673A automatic sampler, and controlled with an HP-CHEM STATION. The following conditions were employed:

First Column	DB-608, 30 meter, 0.53mm fused silica capillary, 0.83 μm film thickness
Injector Temperature	250° C
Detector Temperature	325° C
Temperature Program	150°C for 1 minute 7°C/minto 265°C 18 min at 265°
Second Column	Rtx-1701, 30 meter, 0.53mm fused silica capillary, 0.50 μm film thickness
Injector Temperature	250° C
Detector Temperature	325° C
Temperature Program	150° C for 1 minute 17°C/minto 265°C 18 min at 265°

Quantification was based on the DB-608 column (signal 1) and the identity of the analyte was confirmed using the Rtx-1701 column (signal 2). A fingerprint chromatogram was run using each of the seven Aroclor mixtures, calibration curves were run only if a particular Aroclor was found in the sample.

0113\DEL\AR\9507\REPORT

The PCB results, listed in Tables 13 and 15, are calculated by using the following formula:

$$C_u = \frac{DF x A_u x V_t}{RF_{ave} x V_i x W x D}$$

where

C_u	=	Concentration of analyte (ug/Kg)
DF	=	Dilution Factor
A_u	=	Area or peak height
V_t	=	Volume of sample (ml)
RF_{ave}	=	Average response factor
V_i	=	Volume of extract injected (µl)
W	=	Weight of sample (g)
D	=	Decimal per cent solids

Response Factor calculation:

The RF for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_u}{total\ pg\ injected}$$

where

A_u = Area or peak height

and

$$RF_{ave} = \frac{RF_1 + \ldots + RF_n}{n}$$

where

n = number of samples

Revision 7/11/94

Analytical Procedure for Lipids

The samples were analyzed for lipids according to REAC SOP # 1822. The location of the results are discussed in the PCB section of the methods.

Analytical Procedure for Percent Solids in Tissue

The samples were analyzed for percent solids according to REAC SOP # 1822. The location of the results are discussed in the PCB section of the methods.

Analytical Procedure for PCBs in Tissue

The samples were analyzed for Aroclor 1268 according to REAC SOP # 1822. The results (Aroclor 1268, % lipids and % solids) for the tissue samples are listed in Tables 1.6 through 1.13 as follows:

Tissue	Table
Blanks	Table 1.6
Correlation Table of Samples and Blanks	Table 1.7
Blue Claw Crabs	Table 1.8
Fiddler Crabs	Table 1.9
Brown Shrimp	Table 1.10
Snails	Table 1.11
Spartina Alterniflora	Table 1.12
Diamond Back Terrapin	Table 1.13

Analytical Procedure for Mercury in Tissue

A 0.75 g sample, weighed to centigram accuracy, was analyzed for mercury on a Varian SpectrAA-2[illegible] Atomic Absorption Spectrophotometer equipped with a VGA-76 vapor gas analyzer using modified USEPA Method 7471. The modification consisted in using 8 ml aqua regia and allowing the sample to stand in a water bath for 5-8 minutes prior to digestion.

The results for the tissue samples are listed in Tables 1.14 through 1.24 as follows:

Tissue	Table
Blue Claw Crabs	Table 1.14
Fiddler Crabs	Table 1.15
Brown Shrimp	Table 1.16
Snails (Reference)	Table 1.17
Snails (Whole Body)	Table 1.18
Snails (Station #17-18)	Table 1.19
Spartina Grass	Table 1.20
Turtle Carcass	Table 1.21
Turtle Liver	Table 1.22
Turtle Brain	Table 1.23
Turtle Eggs	Table 1.24

Analytical Procedure for TAL Metals in Water

A 45 ml aliquot of sample was mixed with 5.0 ml concentrated nitric acid, placed in an acid rinsed Teflon container, capped with a Teflon lined cap, and digested according to SW-846, Method 3015, in a CEM MDS-2100 microwave oven (the first stage was at 100% power for 10 minutes and the second stage was at 70% power for 10 minutes). After digestion, the sample was analyzed for all metals, except mercury, by USEPA SW-846 Method 7000/6010.

Mercury was analyzed separately on a Varian SpectrAA-300 Atomic Absorption Spectrophotometer equipped with a Varian VGA-76 vapor gas analyser using modified method 7470 as given by "Test Method for Evaluating Solid Waste, Sept. 1986," USEPA SW-846. Results of the analyses are listed in Table 1.25

Analytical Procedure for TAL Metals in Sediment

One gram of sample, weighed to 0.01 g accuracy, was thoroughly mixed with 10 ml 1:1 nitric acid:water, digested according to method #3050 and analyzed by Method 7000/6010. These methods are contained in Test Methods for Evaluating Solid Wastes, USEPA, SW-846, September, 1987.

Mercury was analyzed separately on a Varian SpectrAA-300 Atomic Absorption Spectrophotometer equipped with a Varian VGA-76 vapor gas analyzer using method 7471 as given by Test Methods for Evaluating Solid Waste, USEPA, SW-846, September, 1986. Results of the analyses are listed in Tables 1.26 and 1.27.

Analytical Procedure for Organic Mercury

The subcontract laboratory determined the organic mercury concentration in the samples using the method described in "Determination of Picogram Levels of Methylmercury by Aqueous Phase Ethylation, Followed by Cryogenic Gas Chromatography with Cold Vapor Atomic Fluorescence Detection", N. Bloom, Can. J. Fish. Aquat. Sci., 46, 1989, 1131-1140. The results of the analyses are listed in Table 1.28.

Analytical Procedure for Oil and Grease and Total Petroleum Hydrocarbons

Extraction Procedure

The soil samples were extracted by the Soxhlet method. A thirty gram aliquot of sample and 30 grams of anhydrous sodium sulfate were mixed together and extracted with 300 ml Freon for 16 hours. The extract was adjusted in volume to 300 ml with Freon. An aliquot of this extract was used for the oil and grease analysis. To a 10 g aliquot, 3 g of silica gel were added and the mixture was shaken for 10 minutes. The silica gel treated sample was then used for the petroleum hydrocarbon analysis.

FTIR Analysis

The extracts were analyzed for oil and grease and total petroleum hydrocarbons. The analysis was done on a Perkin-Elmer Model 1600 Fourier Transform Infrared Spectrophotometer (FTIR).

The FTIR was calibrated using a blend of isooctane and cetane at 2.03, 6.08, 50.7, 203 and 406 ppm. The quantification was based on this calibration and the final concentration was calculated on a dry weight basis.

Calculation

The oil and grease results, listed in Table 1.29, were calculated using the following formulae:

$$Y = mX + b$$

where

m	=	slope of the line
b	=	Y intercept
X	=	concentration
Y	=	absorbance

and

$$C_u = ((Y-b)/m)*F_v*D_f/(W*D)$$

where

C_u	=	Concentration (mg/kg)
Y	=	Absorbance
F_v	=	Final volume of sample
D_f	=	Dilution factor
W	=	Weight of Sample (g)
D	=	decimal percent solids

Analytical Procedure for Total Organic Carbon

The samples were analyzed for total organic carbon according to AASHTO Designation T 267-86. The results are listed in Table 1.30

Table 1.1 Results of the Analysis for Creosote Compounds in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample Number	SBLK05249501		JK24164		D24161		F24162		G24163	
Sampling Location	SAND BLANK		LCP46		LCP43		LCP44		LCP45	
Weight extracted (grams)	30		10		10		10		10	
Final Volume (ml)	1		1		1		1		1	
Extract Dil. Factor	1.0		1.0		1.0		1.0		1.0	
Percent Solid	100		34		26		26		28	
Compound Name	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg
o-Cresol	U	330	U	3000	U	3900	U	3800	U	3700
p-Cresol	U	330	U	3000	U	3900	U	3800	U	3700
Naphthalene	U	330	U	3000	U	3900	U	3800	U	3700
2-Methylnaphthalene	U	330	U	3000	U	3900	U	3800	U	3700
1-Methylnaphthalene	U	330	U	3000	U	3900	U	3800	U	3700
Biphenyl	U	330	U	3000	U	3900	U	3800	U	3700
2,6-Dimethylnaphthalene	U	330	U	3000	U	3900	U	3800	U	3700
Acenaphthylene	U	330	U	3000	U	3900	U	3800	U	3700
Acenaphthene	U	670	U	6000	U	7800	U	7600	U	7400
Dibenzofuran	U	330	U	3000	U	3900	U	3800	U	3700
Fluorene	U	330	U	3000	U	3900	U	3800	U	3700
Pentachlorophenol	U	330	U	3000	U	3900	U	3800	U	3700
Phenanthrene	U	330	U	3000	U	3900	U	3800	U	3700
Anthracene	U	330	U	3000	U	3900	U	3800	U	3700
2-Methylanthracene	U	330	U	3000	U	3900	U	3800	U	3700
Carbazole	U	330	U	3000	U	3900	U	3800	U	3700
Fluoranthene	U	330	240 J	3000	240 J	3900	270 J	3800	170 J	3700
Pyrene	U	670	240 J	6000	210 J	7800	220 J	7600	U	7400
Benzo(a)anthracene	U	330	U	3000	U	3900	U	3800	U	3700
Chrysene	U	330	99 J	3000	U	3900	U	3800	U	3700
Benzo(b)fluoranthene	U	330	U	3000	U	3900	U	3800	U	3700
Benzo(k)fluoranthene	U	330	U	3000	U	3900	U	3800	U	3700
Benzo(e)pyrene	U	330	U	3000	U	3900	U	3800	U	3700
Benzo(a)pyrene	U	330	U	3000	U	3900	U	3800	U	3700
Indeno(1,2,3-cd)pyrene	U	330	U	3000	U	3900	U	3800	U	3700
Dibenzo(a,h)anthracene	U	330	U	3000	U	3900	U	3800	U	3700
Benzo(g,h,i)perylene	U	330	U	3000	U	3900	U	3800	U	3700

Table 1.1 (Cont) Results of the Analysis for Creosote Compounds in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample Number	SBLK05259501		1050A		1051A		1052A		SBLK052395	
Sampling Location	SAND BLANK		LCP47		LCP48		LCP49		SAND BLANK	
Weight extracted (grams)	30		30		30		30		30	
Final Volume (ml)	1		1		1		1		1	
Extract Dil. Factor	1.0		1.0		1.0		1.0		1.0	
Percent Solid	100		33		29		22		100	
Compound Name	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg
o-Cresol	U	330	U	1000	U	1200	U	1500	U	330
p-Cresol	U	330	U	1000	U	1200	U	1500	U	330
Naphthalene	U	330	U	1000	U	1200	U	1500	U	330
2-Methylnaphthalene	U	330	U	1000	U	1200	U	1500	U	330
1-Methylnaphthalene	U	330	U	1000	U	1200	U	1500	U	330
Biphenyl	U	330	U	1000	U	1200	U	1500	U	330
2,6-Dimethylnaphthalene	U	330	U	1000	U	1200	U	1500	U	330
Acenaphthylene	U	330	U	1000	U	1200	U	1500	U	330
Acenaphthene	U	670	U	2100	U	2300	U	3000	U	670
Dibenzofuran	U	330	U	1000	U	1200	U	1500	U	330
Fluorene	U	330	U	1000	U	1200	U	1500	U	330
Pentachlorophenol	U	330	U	1000	U	1200	U	1500	U	330
Phenanthrene	U	330	U	1000	U	1200	U	1500	U	330
Anthracene	U	330	U	1000	U	1200	U	1500	U	330
2-Methylanthracene	U	330	U	1000	U	1200	U	1500	U	330
Carbazole	U	330	U	1000	U	1200	U	1500	U	330
Fluoranthene	U	330	75 J	1000	84 J	1200	80 J	1500	U	330
Pyrene	U	670	110 J	2100	110 J	2300	97 J	3000	U	670
Benzo(a)anthracene	U	330	U	1000	U	1200	U	1500	U	330
Chrysene	U	330	U	1000	U	1200	U	1500	U	330
Benzo(b)fluoranthene	U	330	98 J	1000	U	1200	U	1500	U	330
Benzo(k)fluoranthene	U	330	U	1000	U	1200	U	1500	U	330
Benzo(e)pyrene	U	330	U	1000	U	1200	U	1500	U	330
Benzo(a)pyrene	U	330	U	1000	U	1200	U	1500	U	330
Indeno(1,2,3-cd)pyrene	U	330	U	1000	U	1200	U	1500	U	330
Dibenzo(a,h)anthracene	U	330	U	1000	U	1200	U	1500	U	330
Benzo(g,h,i)perylene	U	330	U	1000	U	1200	U	1500	U	330

Table 1.1 (Cont) Results of the Analysis for Creosote Compounds in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample Number	AB01510		J01508		K10546		K01540		J01545	
Sampling Location	SED 35		REFERENCE		SED 19-20		SED 36		SED 17-18	
Weight extracted (grams)	30		30		30		30		30	
Final Volume (ml)	1		1		1		1		1	
Extract Dil. Factor	1.0		1.0		1.0		1.0		1.0	
Percent Solid	32		22		33		31		34	
Compound Name	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg
o-Cresol	U	1000	U	1500	U	1000	U	1100	U	1000
p-Cresol	U	1000	U	1500	U	1000	U	1100	U	1000
Naphthalene	U	1000	U	1500	U	1000	U	1100	U	1000
2-Methylnaphthalene	U	1000	U	1500	U	1000	U	1100	U	1000
1-Methylnaphthalene	U	1000	U	1500	U	1000	U	1100	U	1000
Biphenyl	U	1000	U	1500	U	1000	U	1100	U	1000
2,6-Dimethylnaphthalene	U	1000	U	1500	U	1000	U	1100	U	1000
Acenaphthylene	U	1000	U	1500	U	1000	U	1100	U	1000
Acenaphthene	U	2100	U	3000	U	2000	U	2200	U	2000
Dibenzofuran	U	1000	U	1500	U	1000	U	1100	U	1000
Fluorene	U	1000	U	1500	U	1000	U	1100	U	1000
Pentachlorophenol	U	1000	U	1500	U	1000	U	1100	U	1000
Phenanthrene	U	1000	U	1500	U	1000	160 J	1100	U	1000
Anthracene	U	1000	U	1500	140 J	1000	64 J	1100	U	1000
2-Methylanthracene	U	1000	U	1500	120 J	1000	U	1100	U	1000
Carbazole	U	1000	U	1500	95 J	1000	U	1100	U	1000
Fluoranthene	77 J	1000	U	1500	110 J	1000	96 J	1100	U	1000
Pyrene	110 J	2100	U	3000	380 J	2000	160 J	2200	U	2000
Benzo(a)anthracene	59 J	1000	U	1500	110 J	1000	U	1100	U	1000
Chrysene	81 J	1000	U	1500	120 J	1000	U	1100	U	1000
Benzo(b)fluoranthene	68 J	1000	U	1500	190 J	1000	U	1100	U	1000
Benzo(k)fluoranthene	U	1000	U	1500	U	1000	U	1100	U	1000
Benzo(e)pyrene	U	1000	U	1500	400 J	1000	U	1100	U	1000
Benzo(a)pyrene	U	1000	U	1500	U	1000	U	1100	U	1000
Indeno(1,2,3-cd)pyrene	U	1000	U	1500	U	1000	U	1100	U	1000
Dibenzo(a,h)anthracene	U	1000	U	1500	U	1000	U	1100	U	1000
Benzo(g,h,i)perylene	U	1000	U	1500	U	1000	U	1100	U	1000

Table 1.1 (Cont) Results of the Analysis for Creosote Compounds in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample Number	1053A		1055A		K24180	
Sampling Location	LCP50		LCP51		LCP 10-11	
Weight extracted (grams)	30		25		30	
Final Volume (ml)	1		1		1	
Extract Dil. Factor	1.0		1.0		1.0	
Percent Solid	26		16		30	
Compound Name	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg	Conc ug/Kg	MDL ug/Kg
o-Cresol	U	1300	U	2500	U	1100
p-Cresol	U	1300	U	2500	U	1100
Naphthalene	U	1300	U	2500	U	1100
2-Methylnaphthalene	U	1300	U	2500	U	1100
1-Methylnaphthalene	U	1300	U	2500	U	1100
Biphenyl	U	1300	U	2500	U	1100
2,6-Dimethylnaphthalene	U	1300	U	2500	U	1100
Acenaphthylene	180 J	1300	U	2500	U	1100
Acenaphthene	U	2500	U	5100	U	2300
Dibenzofuran	U	1300	U	2500	U	1100
Fluorene	U	1300	U	2500	U	1100
Pentachlorophenol	U	1300	U	2500	U	1100
Phenanthrene	U	1300	U	2500	U	1100
Anthracene	U	1300	U	2500	U	1100
2-Methylanthracene	140 J	1300	U	2500	U	1100
Carbazole	U	1300	U	2500	U	1100
Fluoranthene	190 J	1300	U	2500	U	1100
Pyrene	480 J	2500	U	5100	87 J	2300
Benzo(a)anthracene	200 J	1300	U	2500	U	1100
Chrysene	270 J	1300	U	2500	U	1100
Benzo(b)fluoranthene	U	1300	U	2500	U	1100
Benzo(k)fluoranthene	U	1300	U	2500	U	1100
Benzo(e)pyrene	U	1300	U	2500	U	1100
Benzo(a)pyrene	U	1300	U	2500	U	1100
Indeno(1,2,3-cd)pyrene	U	1300	U	2500	U	1100
Dibenzo(a,h)anthracene	U	1300	U	2500	U	1100
Benzo(g,h,i)perylene	U	1300	U	2500	U	1100

Table 1.2 Results of the Analysis for PCB in Water
WA # 0-113 LCP Chemical

Sample ID Location	WBLK052495		A.B24165 LCP 10-11		A-D24167 LCP 19-20		A.B24168 LCP 35-36		A.B24166 LCP 17-18	
	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l
AROCLOR 1016	U	0.25	U	0.30	U	0.28	U	0.29	U	0.28
AROCLOR 1221	U	0.50	U	0.60	U	0.57	U	0.58	U	0.56
AROCLOR 1232	U	0.25	U	0.30	U	0.28	U	0.29	U	0.28
AROCLOR 1242	U	0.25	U	0.30	U	0.28	U	0.29	U	0.28
AROCLOR 1248	U	0.25	U	0.30	U	0.28	U	0.29	U	0.28
AROCLOR 1254	U	0.25	U	0.30	U	0.28	U	0.29	U	0.28
AROCLOR 1260	U	0.25	U	0.30	U	0.28	U	0.29	U	0.28
AROCLOR 1268	U	0.25	0.67	0.30	66	0.28	24	0.29	2.6	0.28

Sample ID Location	WBLK052495		A.B24163 LCP 45		A-D24164 LCP 46		A-B24162 LCP 44		A.B24161 LCP 43	
	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc. ug/l	MDL ug/l	Conc. ug/l	MDL ug/l
AROCLOR 1016	U	0.25	U	0.28	U	0.28	U	0.28	U	0.28
AROCLOR 1221	U	0.50	U	0.56	U	0.56	U	0.56	U	0.56
AROCLOR 1232	U	0.25	U	0.28	U	0.28	U	0.28	U	0.28
AROCLOR 1242	U	0.25	U	0.28	U	0.28	U	0.28	U	0.28
AROCLOR 1248	U	0.25	U	0.28	U	0.28	U	0.28	U	0.28
AROCLOR 1254	U	0.25	U	0.28	U	0.28	U	0.28	U	0.28
AROCLOR 1260	U	0.25	U	0.28	U	0.28	U	0.28	U	0.28
AROCLOR 1268	U	0.25	0.14 J	0.28	0.36	0.28	0.09 J	0.28	0.17 J	0.28

Sample ID Location	WBLK052695		A.B1037 Reference	
	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l
AROCLOR 1016	U	0.25	U	0.38
AROCLOR 1221	U	0.50	U	0.77
AROCLOR 1232	U	0.25	U	0.38
AROCLOR 1242	U	0.25	U	0.38
AROCLOR 1248	U	0.25	U	0.38
AROCLOR 1254	U	0.25	U	0.38
AROCLOR 1260	U	0.25	U	0.38
AROCLOR 1268	U	0.25	0.22 J	0.38

Table 1.3 Results of the Analysis for PCB in Sediment
WA # 0-113 LCP Chemical
(based on dry weight)

Sample ID Location	SBLK05229502		J01508 Reference			AB01510 SED 35		K01546 SED 19-20		K01540 SED 36		J01545 SED 17-18	
	Conc. ug/kg	MDL ug/kg	Conc. ug/kg		MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg
AROCLOR 1016	U	42	U		190	U	129	U	120	U	140	U	120
AROCLOR 1221	U	83	U		370	U	260	U	250	U	270	U	250
AROCLOR 1232	U	42	U		190	U	129	U	120	U	140	U	120
AROCLOR 1242	U	42	U		190	U	129	U	120	U	140	U	120
AROCLOR 1248	U	42	U		190	U	129	U	120	U	140	U	120
AROCLOR 1254	U	42	U		190	U	129	U	120	U	140	U	120
AROCLOR 1260	U	42	U		190	U	129	U	120	U	140	U	120
AROCLOR 1268	U	42	81	J	190	70000	129	150000	120	55000	140	56000	120

Sample ID Location	SBLK05269502		1050A LCP 47		1051A LCP 48		1052A LCP 49		1053A LCP 50		1055A LCP 51	
	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg
AROCLOR 1016	U	42	U	130	U	150	U	190	U	160	U	400
AROCLOR 1221	U	83	U	260	U	290	U	380	U	310	U	790
AROCLOR 1232	U	42	U	130	U	150	U	190	U	160	U	400
AROCLOR 1242	U	42	U	130	U	150	U	190	U	160	U	400
AROCLOR 1248	U	42	U	130	U	150	U	190	U	160	U	400
AROCLOR 1254	U	42	U	130	U	150	U	190	U	160	U	400
AROCLOR 1260	U	42	570	130	730	150	700	190	320	160	32000	400
AROCLOR 1268	U	42	18000	130	10000	150	6600	190	1100	160	860000	400

Sample ID Location	SBLK05259502		JK24164 LCP 46		D24161 LCP 43		F24162 LCP 44		G24163 LCP 45	
	Conc	MDL	Conc	MDL	Conc	MDL	Conc.	MDL	Conc.	MDL
AROCLOR 1016	U	42	U	460	U	490	U	480	U	470
AROCLOR 1221	U	83	U	920	U	970	U	950	U	940
AROCLOR 1232	U	42	U	460	U	490	U	480	U	470
AROCLOR 1242	U	42	U	460	U	490	U	480	U	470
AROCLOR 1248	U	42	U	460	U	490	U	480	U	470
AROCLOR 1254	U	42	U	460	U	490	U	480	U	470
AROCLOR 1260	U	42	U	460	U	490	U	480	U	470
AROCLOR 1268	U	42	5900	460	5200	490	8800	480	6200	470

Table 1.4 Results of the Analysis for Aroclor 1268 in Surface Water
WA # 0-113 LCP Chemicals

Sample ID	Location	Aroclor 1268 (ug/l)	MDL (ug/l)
A.B24165	LCP 10-11	0.67	0.30
A-D24168	LCP 19-20	66	0.28
A.B24168	LCP 35-36	24	0.29
A.B24166	LCP 17-18	2.6	0.28
A.B 24163	LCP 45	0.14J	0.28
A-D24164	LCP 46	0.36	0.28
A-B24162	LCP 44	0.09J	0.28
A.B 24161	LCP 43	0.17J	0.28
A.B1037	Reference	0.22J	0.38

Table 1.5 Results of the Analyses for Aroclor 1260
and Aroclor 1268 in Sediment
WA # 0-113 LCP Chemicals
(based on dry weight)

Sample ID	Location	Aroclor 1260 (ug/kg)	MDL (ug/kg)	Aroclor 1268 (ug/kg)	MDL (ug/kg)
Reference	J01508	ND	190	81J	190
SED 35	A,B01510	ND	129	70000	129
SED 19-20	01546	ND	120	150000	120
SED 36	01540	ND	140	55000	140
SED 17-18	J01545	ND	120	56000	120
LCP 46	J,K24164	ND	460	5900	460
LCP 43	D24161	ND	490	5200	490
LCP 44	F24162	ND	480	8800	480
LCP 45	G24163	ND	470	6200	470
LCP 47	1050A	570	130	18000	130
LCP 48	1051A	730	150	10000	150
LCP 49	1052A	700	190	6600	190
LCP 50	1053A	320	160	1100	160
LCP 51	1055A	32000	400	910000	400

Table 1.8 Results of the Analysis for PCBs in Blanks for Tissue Samples
WA # 0-113 LCP Chemical Site

Sample ID	Method Blank 052095 CL		Method Blank 052095 TL		Method Blank 052195 CL		Method Blank 052195 TL		Method Blank 052495 TL	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aroclor 1016	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1221	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040
Aroclor 1232	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1242	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1248	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1254	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1260	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1268	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020

Sample ID	Method Blank 052495 CL		Method Blank 052595 TL		Method Blank 052695 TL		Method Blank 052695 CL		Method Blank 053095 TL	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aroclor 1016	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1221	U	0.040	U	0.040	U	0.040	U	0.040	U	0.040
Aroclor 1232	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1242	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1248	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1254	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1260	U	0.020	U	0.020	U	0.020	U	0.020	U	0.020
Aroclor 1268	U	0.020	U	0.020	U	0.020	0.003 J	0.020	U	0.020

Sample ID	Method Blank 053095 CL		Method Blank 053195 TL	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aroclor 1016	U	0.020	U	0.020
Aroclor 1221	U	0.040	U	0.040
Aroclor 1232	U	0.020	U	0.020
Aroclor 1242	U	0.020	U	0.020
Aroclor 1248	U	0.020	U	0.020
Aroclor 1254	U	0.020	U	0.020
Aroclor 1260	U	0.020	U	0.020
Aroclor 1268	U	0.020	U	0.020

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Table 1.7 Correlation of Samples and Blanks for
Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 052495 CL

Samples Extracted	Matrix
A 20610-01	Fiddler Crabs
A 20610-02	Fiddler Crabs
A 20610-03	Fiddler Crabs
A 20610-04	Fiddler Crabs
A 20610-05	Fiddler Crabs
A 20610-06	Fiddler Crabs
A 20610-07	Fiddler Crabs
A 20611-01	Fiddler Crabs
A 20611-02	Fiddler Crabs
A 20611-03	Fiddler Crabs
A 20611-04	Fiddler Crabs
A 20611-05	Fiddler Crabs
A 20611-06	Fiddler Crabs
A 20611-07	Fiddler Crabs
1016-01	Fiddler Crabs
1016-02	Fiddler Crabs
1016-03	Fiddler Crabs
1016-04	Fiddler Crabs
1016-05	Fiddler Crabs
1016-06	Fiddler Crabs
A 01992	Blue Claw Crabs
A 01995	Blue Claw Crabs
A 01997	Blue Claw Crabs

Table 1.7 (Cont) Correlation of Samples and Blanks for
Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 052595 TL

Samples Extracted	Matrix
A 03126	Blue Claw Crabs
A 01553	Blue Claw Crabs
1005	Blue Claw Crabs
1007	Blue Claw Crabs
A 00570	Turtle Liver
A 00572	Turtle Carcass
A 00574	Turtle Carcass
1001	Turtle Carcass
1003	Diamond Back Terrapin
1035-01	Snail
1035-02	Snail
1035-03	Snail
1035-04	Snail
1035-05	Snail
1035-06	Snail
1036-01	Snail
1036-02	Snail
1036-03	Snail
1036-04	Snail
1036-05	Snail
1036-06	Snail
1036-07	Snail
A 00617	Diamond Back Terrapin

Table 1.7 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 052695 TL

Samples Extracted	Matrix
A 01553 MS	Blue Claw Crabs
A 01553 MSD	Blue Claw Crabs
1005 MS	Blue Claw Crabs
1005 MSD	Blue Claw Crabs
1007 MS	Blue Claw Crabs
1007 MSD	Blue Claw Crabs
A 00572 MS	Diamond Back Terrapin
A 00572 MSD	Diamond Back Terrapin
A 20628 C MS	Brown Shrimp
A 20628 C MSD	Brown Shrimp
A 20629 C MS	Brown Shrimp
A 20629 C MSD	Brown Shrimp
A 01999 MS	Blue Claw Crabs
A 01999 MSD	Blue Claw Crabs

Table 1.7 (Cont) Correlation of Samples and Blanks for
Aroclor 1268 in Tissues
WA # 0–113 LCP Chemical Site

Method Blank 052695 CL

Samples Extracted	Matrix
A 00575	Diamond Back Terrapin
A 00576	Diamond Back Terrapin
A 00606	Diamond Back Terrapin
A 00612	Diamond Back Terrapin
A 00615	Diamond Back Terrapin
A 00616	Diamond Back Terrapin
1036–07 MS	Snail
1036–07 MSD	Snail
A 01992 MS	Blue Claw Crabs
A 01992 MSD	Blue Claw Crabs
A 01995 MS	Blue Claw Crabs
A 01995 MSD	Blue Claw Crabs
A 01997 MS	Blue Claw Crabs
A 01997 MSD	Blue Claw Crabs

Table 1.7 (Cont) Correlation of Samples and Blanks for
Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 053095 TL

Samples Extracted	Matrix
1345 C	Brown Shrimp
1231	Blue Claw Crabs
1233	Blue Claw Crabs
1235	Blue Claw Crabs
1237	Blue Claw Crabs
1301	Blue Claw Crabs
1303	Blue Claw Crabs
1305	Blue Claw Crabs
1232	Blue Claw Crabs
1236	Blue Claw Crabs
1234	Blue Claw Crabs
1238	Blue Claw Crabs
1302	Blue Claw Crabs
1304	Blue Claw Crabs
1306	Blue Claw Crabs
1227	Blue Claw Crabs
1229	Blue Claw Crabs
1228	Blue Claw Crabs
1230	Blue Claw Crabs
1284	Blue Claw Crabs
1286	Blue Claw Crabs
1288	Blue Claw Crabs
1292	Blue Claw Crabs

Table 1.7 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues
WA # 0–113 LCP Chemical Site

Method Blank 052095 CL

Samples Extracted	Matrix
A 01512	Diamond Back Terrapin Carcass
B 01512	Diamond Back Terrapin Carcass
A 01513	Diamond Back Terrapin Carcass
B 01513	Diamond Back Terrapin Carcass
A 01512 MS	Diamond Back Terrapin Carcass
A 01512 MSD	Diamond Back Terrapin Carcass
A 01515	Blue Claw Crabs
A 01516	Blue Claw Crabs
A 01517*	Blue Claw Crabs
A 01518*	Blue Claw Crabs
A 01519*	Blue Claw Crabs
A 01514*	Blue Claw Crabs
A 01515 MS	Blue Claw Crabs
A 01515 MSD	Blue Claw Crabs
A 25574–01	Fiddler Crabs
A 25574–01 MS	Fiddler Crabs
A 25574–01 MSD	Fiddler Crabs
A 25574–02	Fiddler Crabs
A 25574–03	Fiddler Crabs
A 25574–04	Fiddler Crabs
A 25574–05	Fiddler Crabs
A 25574–06	Fiddler Crabs
A 25574–07	Fiddler Crabs

* denotes that these samples are prefixed by 'B' in other tables

Table 1.7 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 052095 TL

Samples Extracted	Matrix
A 20636 C	Brown Shrimp
A 20642 C	Brown Shrimp
A 20646 C	Brown Shrimp
A 20650 C	Brown Shrimp
A 20637 C	Brown Shrimp
A 20643 C	Brown Shrimp
A 20647 C	Brown Shrimp
A 20651 C	Brown Shrimp
A 20654 C	Brown Shrimp
A 19763 C	Brown Shrimp
A 01504	Brown Shrimp
A 1506 C	Brown Shrimp
A 20655 C	Brown Shrimp
A 19764 C	Brown Shrimp
A 01505	Brown Shrimp
A 01507 C	Brown Shrimp

Table 1.7 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 052195 CL

Samples Extracted	Matrix
A 01544	Spartina Alterniflora
A 01544 MS	Spartina Alterniflora
A 01544 MSD	Spartina Alterniflora
A 01541	Spartina Alterniflora
A 01542	Spartina Alterniflora
A 01543	Fiddler Crabs
A 01543 MS	Fiddler Crabs
A 01543 MSD	Fiddler Crabs
B 03124	Blue Claw Crabs
B 03124 MS	Blue Claw Crabs
B 03124 MSD	Blue Claw Crabs
A 03122	Blue Claw Crabs
A 03121	Blue Claw Crabs

Table 1.7 (Cont) Correlation of Samples and Blanks for
Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 052195 TL

Samples Extracted	Matrix
A 03123	Blue Claw Crabs
A 03123 MS	Blue Claw Crabs
A 03123 MSD	Blue Claw Crabs
B 01520 C	Brown Shrimp
B 01520 C MS	Brown Shrimp
B 01520 C MSD	Brown Shrimp
B 01526 C	Brown Shrimp
B 01530 C	Brown Shrimp
B 01534 C	Brown Shrimp
B 01536	Brown Shrimp
B 01521 C	Brown Shrimp
B 01521 C MS	Brown Shrimp
B 01521 C MSD	Brown Shrimp
B 01527 C	Brown Shrimp
B 01531 C	Brown Shrimp
B 01535 C	Brown Shrimp
B 01537	Brown Shrimp

Table 1.7 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues WA # 0–113 LCP Chemical Site

Method Blank 052495 TL

Samples Extracted	Matrix
A 20634 C	Brown Shrimp
A 01560 C	Brown Shrimp
A 20620 C	Brown Shrimp
A 20628 C	Brown Shrimp
1010 C	Brown Shrimp
1019 C	Brown Shrimp
1027 C	Brown Shrimp
A 20635 C	Brown Shrimp
A 01561 C	Brown Shrimp
A 20621 C	Brown Shrimp
A 20629 C	Brown Shrimp
1011 C	Brown Shrimp
1020 C	Brown Shrimp
1028 C	Brown Shrimp
A 01993	Blue Claw Crabs
A 01994	Blue Claw Crabs
A 01996	Blue Claw Crabs
A 01998	Blue Claw Crabs
A 03125	Blue Claw Crabs
A 01551	Blue Claw Crabs
A 01552	Blue Claw Crabs
1004	Blue Claw Crabs
1006	Blue Claw Crabs

Table 1.7 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues WA # 0–113 LCP Chemical Site

Method Blank 053095 CL

Samples Extracted	Matrix
1062 C	Brown Shrimp
A 24189 C	Brown Shrimp
A 00708 C	Brown Shrimp
A 00712 C	Brown Shrimp
A 00716 C	Brown Shrimp
1058 C	Brown Shrimp
1063 C	Brown Shrimp
A 00818 C	Brown Shrimp
A 00709 C	Brown Shrimp
A 00713 C	Brown Shrimp
A 00717 C	Brown Shrimp
1059 C	Brown Shrimp
1200 C	Brown Shrimp
1209 C	Brown Shrimp
1314 C	Brown Shrimp
1322 C	Brown Shrimp
1330 C	Brown Shrimp
1338 C	Brown Shrimp
1346 C	Brown Shrimp
1099 C	Brown Shrimp
1208 C	Brown Shrimp
1313 C	Brown Shrimp
1321 C	Brown Shrimp

Table 1.7 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 053195 TL

Samples Extracted	Matrix
1294	Blue Claw Crabs
1296	Blue Claw Crabs
1298	Blue Claw Crabs
1285	Blue Claw Crabs
1287	Blue Claw Crabs
1289	Blue Claw Crabs
1293	Blue Claw Crabs
1295	Blue Claw Crabs
1297	Blue Claw Crabs
1299	Blue Claw Crabs
1311-01	Snails
1311-02	Snails
1311-03	Snails
A 00618	Brown Shrimp
A 00716 C	Brown Shrimp
1322 C	Brown Shrimp
A 00570	Blue Claw Crabs
1237	Blue Claw Crabs
1303	Blue Claw Crabs
1229	Blue Claw Crabs
1307	Blue Claw Crabs
1306	Blue Claw Crabs
1227	Blue Claw Crabs
1228	Blue Claw Crabs
1062 C	Brown Shrimp
1238	Blue Claw Crabs
1302	Blue Claw Crabs
A 24169 C	Brown Shrimp
1304	Blue Claw Crabs
1230	Blue Claw Crabs
1236	Blue Claw Crabs
1284	Blue Claw Crabs
1286	Blue Claw Crabs
1288	Blue Claw Crabs
1292	Blue Claw Crabs
1063 C	Brown Shrimp
A 00709 C	Brown Shrimp
A 00708 C	Brown Shrimp
A 00713 C	Brown Shrimp
A 00712 C	Brown Shrimp
A 00717 C	Brown Shrimp
A 00716 C	Brown Shrimp
1059 C	Brown Shrimp
1058 C	Brown Shrimp
1200 C	Brown Shrimp
1209 C	Brown Shrimp
1314 C	Brown Shrimp
1322 C	Brown Shrimp
1330 C	Brown Shrimp
A 00618 C	Brown Shrimp
1099 C	Brown Shrimp
1346 C	Brown Shrimp
1208 C	Brown Shrimp
1388 C	Brown Shrimp
1313 C	Brown Shrimp
1321 C	Brown Shrimp
1329 C	Brown Shrimp
1337 C	Brown Shrimp
1301	Brown Shrimp
1345 C	Brown Shrimp

Table 1.8 Results of the Analyses for Aroclor 1268 in Blue Claw Crabs
WA # 0-113 LCP Chemical Site
(based on dry weight)

Location	Edible Tissue: Sample ID	% Solid	% Lipids	Aroclor 1268 (mg/kg)	MDL (mg/kg)	Inedible Tissue: Sample ID	% Solid	% Lipids	Aroclor 1268 (mg/kg)	MDL (mg/kg)
Purvis Creek	B01517	24	4.3	0.84	0.13	A01516	40	2.4	1.63	0.05
Purvis Creek	A01514	13	4.7	1.84	0.14	A01515	27	1.3	1.00	0.07
Purvis Creek	B01519	25	3.5	2.86	0.08	B01518	38	4.0	8.85	0.05
Purvis Creek	A03123	19	4.7	0.98	0.20	B03124	33	2.5	2.25	0.06
Purvis Creek	A03121	17	3.3	1.29	0.12	A03122	23	2.4	0.56	0.05
Purvis Creek – DS	1227	18	2.9	3.08	0.11	1228	35	1.3	2.13	0.057
Purvis Creek – DS	1229	17	2.3	0.89	0.11	1230	36	1.0	0.43	0.053
Purvis Creek – US	1231	12	4.0	0.49	0.28	1232	25	3.6	0.59	0.076
Purvis Creek – US	1233	19	7.1	5.3	0.10	1234	34	3.5	3.6	0.057
Purvis Creek – US	1235	21	4.6	2.5	0.092	1236	41	1.9	1.69	0.046
Purvis Creek – US	1237	23	3.0	0.83	0.085	1238	22	3.5	3.98	0.087
Purvis Creek – US	1305	18	4.8	2.54	0.11	1306	37	3.1	2.12	0.052
Purvis Creek – US	1303	19	3.2	1.14	0.10	1304	36	1.8	1.50	0.054
Purvis Creek – US	1301	21	3.8	1.54	0.092	1302	34	2.1	1.69	0.057
Reference	A03125	18	2.9	0.028J	0.22	A02000	25	3.0	0.023J	0.079
Reference	A01996	14	3.1	0.017J	0.14	A01997	33	1.8	0.039J	0.060
Reference	A01998	9	4.0	0.049J	0.22	A01999	17	4.8	0.76	0.12
Reference	A01994	15	2.6	0.019J	0.15	A01995	29	1.7	0.044J	0.067
Reference	A[illegible]551	15	4.3	0.016J	0.17	A03126	20	4.9	0.038J	0.095
Reference	A01552	19	5.3	0.051J	0.10	A01553	35	4.4	0.11	0.056
Reference	A01993	13	4.1	0.066J	0.14	A01992	23	3.3	0.048J	0.066
Reference	1006	20	3.0	0.025J	0.097	1007	53	3.3	0.016J	0.037
Reference	1004	19	3.8	0.024J	0.11	1005	9	6.8	0.067J	0.22
Turtle River	1296	16	3.1	0.32	0.18	1297	32	1.7	0.20	0.061
Turtle River	1292	21	3.2	0.15	0.093	1293	33	3.4	0.53	0.060
Turtle River	1286	21	3.6	0.22	0.10	1287	33	3.3	0.31	0.060
Turtle River	1298	16	2.9	0.15	0.12	1299	30	1.2	0.11	0.066
Turtle River	1284	18	3.5	0.23	0.12	1285	33	2.9	0.30	0.059
Turtle River	1288	20	2.8	0.16	0.093	1289	34	3.8	0.37	0.057
Turtle River	1294	15	2.7	0.17	0.13	1295	30	1.6	0.11	0.066

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Table 1.9 Results of the Analysis for Aroclor 1268 in Fiddler Crabs WA # 0-113 LCP Chemical Site

Sample Location	Sample Number	% Solid	% Lipids	Aroclor 1268 (mg/kg)	MDL (mg/kg)
LCP 10-11	1016-01	34	4.7	4.80	0.059
LCP 10-11	1016-02	32	4.8	5.3	0.058
LCP 10-11	1016-03	38	4.5	5.10	0.063
LCP 10-11	1016-04	31	5.1	5.40	0.061
LCP 10-11	1016-05	33	4.7	3.60	0.059
LCP 10-11	1016-06	31	5.9	5.0	0.063
LCP 17-18	A20611-01	39	2.6	27	0.051
LCP 17-18	A20611-02	35	2.7	33	0.054
LCP 17-18	A20611-03	32	3.1	59	0.062
LCP 17-18	A20611-04	33	2.5	23	0.060
LCP 17-18	A20611-05	32	3.0	61	0.062
LCP 17-18	A20611-06	33	2.7	36	0.058
LCP 17-18	A20611-07	36	2.8	42	0.050
LCP 19-20	A01543	27	2.6	67.8	0.07
Outfall	A25574-01	30	3.0	47.2	0.20
Outfall	A25574-02	32	4.2	57.1	0.15
Outfall	A25574-03	30	3.3	32.0	0.14
Outfall	A25574-04	28	3.2	46.8	0.14
Outfall	A25574-05	29	2.9	48.4	0.11
Outfall	A25574-06	32	2.0	18.8	0.12
Outfall	A25574-07	32	2.8	51.2	0.09
Reference	A20610-01	36	4.7	0.068	0.055
Reference	A20610-02	33	6.0	0.12	0.059
Reference	A20610-03	32	5.7	0.095	0.063
Reference	A20610-04	33	4.3	0.087	0.058
Reference	A20610-05	31	4.6	0.074	0.064
Reference	A20610-06	34	3.2	0.057 J	0.058
Reference	A20610-07	35	4.2	0.057	0.056

Table 1.10 Results of the Analysis for Aroclor 1268 in Brown Shrimp
WA # 0–113 LCP Chemical Site

Sample Location	Edible Tissue: Sample Number	Edible Tissue: % Solid	Edible Tissue: % Lipids	Edible Tissue: Aroclor 1268 (mg/kg)	Edible Tissue: MDL (mg/kg)	Inedible Tissue: Sample Number	Inedible Tissue: % Solid	Inedible Tissue: % Lipids	Inedible Tissue: Aroclor 1268 (mg/kg)	Inedible Tissue: MDL (mg/kg)
Purvis Creek	B01536C	24	2.9	0.22	0.16	B01537	27	9.3	1.18	0.15
Purvis Creek	B01520C	23	3.8	0.50	0.22	B01821C	28	8.1	2.28	0.17
Purvis Creek	A20642C	25	2.0	0.77	0.12	A20643C	29	8.5	4.15	0.11
Purvis Creek	A20646C	24	2.8	0.71	0.13	A20647C	30	9.2	3.90	0.08
Purvis Creek	A20650C	24	2.8	0.35	0.12	A20651C	30	6.4	1.14	0.12
Purvis Creek	A20654C	24	3.3	0.86	0.08	A20655C	30	6.3	2.16	0.07
Purvis Creek	A20636C	22	3.2	1.07	0.11	A20637C	27	6.0	3.10	0.09
Purvis Creek	B01534C	22	1.6	0.43	0.15	B01535C	26	9.5	2.16	0.13
Purvis Creek	B01530C	24	4.1	0.91	0.16	B01531C	29	13.4	7.34	0.13
Purvis Creek	B01526C	24	5.2	0.54	0.17	B01527C	28	8.7	2.35	0.10
Purvis Creek – US	1322C	23	2.1	1.05	0.10	1321C	30	6.1	4.04	0.064
Purvis Creek – US	1200C	23	3.5	1.00	0.069	1099C	28	5.0	2.26	0.34
Purvis Creek – US	1209C	22	2.7	0.79	0.069	1208C	30	5.8	3.73	0.066
Purvis Creek – US	1314C	24	4.0	0.87	0.062	1313C	30	6.9	4.97	0.063
Purvis Creek – US	1346C	23	2.6	1.42	0.065	1345C	30	6.2	3.75	0.065
Purvis Creek – US	1338C	34	2.3	0.74	0.056	1337C	22	8.0	6.55	0.069
Purvis Creek – US	1330C	23	2.8	0.90	0.064	1329C	31	5.7	3.99	0.064
Reference	A20634C	23	2.2	0.022J	0.066	A20635C	28	6.3	0.067J	0.071
Reference	A01506C	22	3.4	0.021J	0.08	A01507C	28	6.4	0.048J	0.10
Reference	A20628C	23	1.6	0.015J	0.065	A20629C	27	8.0	0.095	0.072
Reference	A20620C	25	1.7	0.015J	0.078	A20621C	29	7.9	0.077	0.069
Reference	A19763C	20	2.3	0.032J	0.17	A19764C	23	6.6	0.049J	0.22
Reference	1027C	24	1.8	0.026J	0.063	1028C	29	7.1	0.065J	0.068
Reference	1010C	24	1.8	0.016J	0.079	1011C	28	6.5	0.056J	0.071
Reference	A01504	23	3.0	0.036J	0.21	A01505	29	8.1	0.055J	0.15
Reference	1019C	23	1.6	0.018J	0.066	1020C	28	6.9	0.076	0.071
Reference	A01560C	24	1.8	0.014J	0.063	A01561C	30	8.8	0.064	0.063
Turtle River	A00716C	27	5.9	0.45	0.41	A00717C	31	4.1	0.38	0.063
Turtle River	A00712C	25	3.5	0.31	0.076	A00713C	30	5.4	0.72	0.080
Turtle River	A00708C	27	2.6	0.30	0.071	A00709C	26	4.5	0.43	0.077
Turtle River	1062C	23	4.1	0.64	0.063	1063C	15	9.6	3.34	0.13
Turtle River	1058C	24	2.6	0.20	0.080	1059C	31	5.5	0.80	0.073
Turtle River	A24169C	26	10.0	0.16	0.075	A00618C	30	9.4	1.10	0.40

Table 1.10 A Results of the Reanalysis of Selected Samples for Aroclor 1268 in Brown Shrimp
WA # 0–113 LCP Chemical Site

Sample Number	Sample Location	Original Analysis Aroclor 1268 (mg/kg)	Original Analysis MDL (mg/kg)	Reanalysis Aroclor 1268 (mg/kg)	Reanalysis MDL (mg/kg)	Realtive Percent Difference
A20621C	Reference	0.077	0.069	0.062 J	0.069	5
A19764C	Reference	0.049 J	0.22	0.049 J	0.22	0
1028C	Reference	0.065 J	0.068	0.048 J	0.068	8
1011C	Reference	0.056 J	0.071	0.053 J	0.071	1
A01504	Reference	0.036 J	0.21	0.033 J	0.21	2

Table 1.11 Results of the Analysis for Aroclor 1268 in Snails
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample Location	Sample Number	% Solid	% Lipids	Aroclor 1268 (mg/kg)	MDL (mg/kg)
Reference	1035-01	57	3.5	0.057	0.034
Reference	1035-02	35	5.1	0.041J	0.057
Reference	1035-03	25	8.5	0.046J	0.074
Reference	1035-04	30	7.0	0.040J	0.063
Reference	1035-05	24	9.8	0.037J	0.08
Reference	1035-06	16	12.0	0.060J	0.121
LCP 17-18	1036-01	24	10.3	4.8	0.082
LCP 17-18	1036-02	29	7.9	3.9	0.066
LCP 17-18	1036-03	28	9.1	3.8	0.067
LCP 17-18	1036-04	24	10.2	4.3	0.081
LCP 17-18	1036-05	24	8.8	4.2	0.077
LCP 17-18	1036-06	17	12.8	5.6	0.17
LCP 17-18	1036-07	40	5.0	2.4	0.046
LCP5	1311-01	27	13.6	59	0.07
LCP5	1311-02	31	12.8	55	0.076
LCP5	1311-03	28	11.1	41	0.084

Table 1.12 Results of the Analysis for Aroclor 1268 in Spartina Alterniflora
WA # 0—113 LCP Chemical Site

Sample Location	Sample Number	% Solid	% Lipids	Aroclor 1268 (mg/kg)	MDL (mg/kg)
LCP 35	A01541	28	1.9	18.9	1.46
Reference	A01542	28	1.7	0.021J	0.069
LCP 17—18	A01544	31	2.2	3.34	0.33

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Table 1.13 Results of the Analysis for Aroclor 1268 in Diamond Back Terrapin
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample Location*	Sample Number	% Solid	% Lipids	Matrix	Aroclor 1268 (mg/kg)	MDL (mg/kg)
DD-1	C01512	NA	NA	Brain	NA	NA
DD-1	A01512	28	11.2	Carcass	1.7	0.07
DD-1	B01512	24	34.9	Liver	12.3	0.10
DD-2	C01513	NA	NA	Brain	NA	NA
DD-2	A01513	28	11.4	Carcass	11.9	0.07
DD-2	B01513	28	20.2	Liver	20.1	0.10
DD-4	1002	NA	NA	Brain	NA	NA
DD-4	1001	24	5.8	Carcass	16	0.08
DD-4	1003	20	22.4	Liver	64	0.1
DD-5	A00571	NA	NA	Brain	NA	NA
DD-5	A00572	13	11.6	Carcass	620	0.151
DD-5	A00575	41	25.2	Egg	430	0.093
DD-5	A00576	41	25.1	Egg	450	0.075
DD-5	A00606	32	33.5	Egg	610	0.095
DD-5	A00612	39	27.4	Egg	440	0.079
DD-5	A00615	38	28.4	Egg	490	0.092
DD-5	A00616	45	22.5	Egg	390	0.063
DD-5	A00617	34	28.1	Egg	530	0.113
DD-5	A00570	13	59.1	Liver	3500	150
DD-6	A00573	NA	NA	Brain	NA	NA
DD-6	A00574	22	9.1	Carcass	500	0.09

*each unique sample location represents a unique individual turtle

Table 1.14 Results of the Analysis for Mercury in Blue Claw Crabs
WA # 0–113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Edible Conc Hg ug/kg	Edible MDL ug/kg	Edible % Solids	Client ID	Inedible Conc Hg ug/kg	Inedible MDL ug/kg	Inedible % Solids
Method Blank 2	Lab	U	40					
A03121	Purvis Creek	6000	130	17	A03122	1300	69	34
A03123	Purvis Creek	6600	230	19	B03124	1800	84	33
Method Blank	Lab	U	40					
A01993	Reference	520	160	13	A01992	140	90	23
A01994	Reference	550	180	15	A01995	120	110	29
A01996	Reference	U	390	14	A01997	U	63	33
A01998	Reference	470	300	9	A01999	U	140	17
A03125	Reference	230	200	18	A02000	U	73	25
A01551	Reference	410	190	15	A03126	U	140	20
A01552	Reference	800	190	19	A01553	210	58	35
1004	Reference	350	110	19	1005	U	390	9
1006	Reference	330	110	20	1007	U	61	53
Method Blank	Lab.	U	40					
1227	U.S. Purvis	26000	720	18	1306	1700	66	37
1229	U.S. Purvis	14000	310	17	1228	5400	130	34
1284	Turtle River	970	170	18	1285	260	61	33
1286	Turtle River	740	190	21	1287	260	83	33
1288	Turtle River	950	180	20	1289	310	61	34
1292	Turtle River	2300	130	21	1293	510	84	33
1231	U.S. Purvis	540	280	12	1230	3000	63	36
1233	U.S. Purvis	18000	920	19	1232	220	140	25
1235	U.S. Purvis	12000	290	21	1234	5200	150	34
1237	U.S. Purvis	5800	210	23	1236	2700	65	41
1301	U.S. Purvis	3900	110	21	1238	3100	110	22
1303	U.S. Purvis	2600	120	19	1302	1300	100	34
1305	U.S. Purvis	7200	140	18	1304	840	81	36
1294	Turtle River	1300	170	15	1295	340	89	30
1296	Turtle River	1700	240	16	1297	280	88	32
1298	Turtle River	640	120	16	1299	230	66	30
Method Blank 2	Lab	U	40					
A01514	Purvis Creek	8900	320	13	A01515	2000	110	27
B01517	Purvis Creek	2100	110	24	A01516	660	57	40
B01519	Purvis Creek	7000	240	25	B01518	2400	69	38

Table 1.15 Results of the Analysis for Mercury in Fiddler Crabs
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Conc Hg ug/kg	MDL ug/kg	% Solids
Method Blank 2	Lab	U	40	
A01543	LCP 19-20	2800	94	27
A25574-01	Outfall	2700	73	30
A25574-02	Outfall	4100	100	31
A25574-03	Outfall	1800	95	30
A25574-0[illegible]	Outfall	3400	71	28
A25574-05	Outfall	1500	86	29
A25574-06	Outfall	2100	67	32
A25574-07	Outfall	2800	78	32
Method Blank	Lab	U	40	
A20610-01	Reference	63	57	36
A20610-02	Reference	65	50	33
A20610-03	Reference	U	91	31
A20610-04	Reference	76	41	33
A20610-05	Reference	71	51	31
A20610-06	Reference	U	110	34
A20610-07	Reference	49	34	35
A20611-01	LCP 17-18	960	67	39
A20611-02	LCP 17-18	1800	49	35
A20611-03	LCP 17-18	1900	60	32
A20611-04	LCP 17-18	2100	39	33
A20611-05	LCP 17-18	2000	56	32
A20611-06	LCP 17-18	3500	78	33
A20611-07	LCP 17-18	1500	65	36
1016-01	LCP 10-11	600	93	34
1016-02	LCP 10-11	630	150	32
1016-03	LCP 10-11	570	55	37
1016-04	LCP 10-11	730	96	31
1016-05	LCP 10-11	790	75	33
1016-06	LCP 10-11	640	59	31
1016-07	LCP 10-11	650	55	NA

NA denotes not performed because of insufficient sample amount

Table 1.16 Results of the Analysis for Mercury in Brown Shrimp
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Edible Conc Hg ug/kg	Edible MDL ug/kg	Edible % Solids	Client ID	Inedible Conc Hg ug/kg	Inedible MDL ug/kg	Inedible % Solids
Method Blank 1	Lab	U	40					
B01520C	Purvis Creek	350	170	23	B01521C	270	150	28
B01526C	Purvis Creek	340	150	24	B01527C	240	120	28
B01530C	Purvis Creek	470	120	24	B01531C	420	130	29
B01534C	Purvis Creek	330	170	22	B01535C	230	100	26
B01536	Purvis Creek	210	110	24	B01537	150	110	27
Method Blank	Lab	U	40					
A20634C	Reference (Troupe Creek)	110	110	23	A20635C	U	130	28
A01560C	Reference (Troupe Creek)	U	120	24	A01561C	U	91	30
A20620C	Reference (Troupe Creek)	88	88	25	A20621C	U	92	29
A20628C	Reference (Troupe Creek)	U	180	23	A20629C	U	83	27
1010C	Reference	110	100	24	1011C	72	69	28
1019C	Reference	U	130	23	1020C	U	100	28
1027C	Reference	85	81	24	1028C	U	200	29
Method Blank	Lab	U	40					
1314C	U.S. Purvis	560	120	24	1099C	360	93	28
1322C	U.S. Purvis	620	110	23	1208C	300	100	30
1330C	U.S. Purvis	540	100	23	1313C	390	100	30
1338C	U.S. Purvis	260	68	34	1321C	400	80	30
1346C	U.S. Purvis	640	170	23	1329C	370	95	31
1200C	U.S. Purvis	510	140	22	1337C	530	140	22
1209C	U.S. Purvis	490	120	22	1345C	400	87	30
1062C	Turtle River	400	110	23	1063C	570	240	15
A24169C	Turtle River	360	100	26	A00618C	280	95	30
A00708C	Turtle River	350	100	27	A00709C	270	110	26
A00712C	Turtle River	420	150	25	A00713C	240	110	30
A00716C	Turtle River	420	110	27	A00717C	180	110	31
1058C	Turtle River	280	130	24	1059C	150	120	31
Method Blank 1	Lab	U	40					
A01504	Reference	U	150	23	A01505	U	110	29
A10506C	Reference	U	140	22	A01507C	U	110	28
A19763C	Reference	U	190	20	A19764C	U	200	23
A20636C	Purvis Creek	400	190	22	A20637C	350	190	27
A20642C	Purvis Creek	500	120	25	A20643C	380	130	29
A20646C	Purvis Creek	530	120	24	A20647C	320	120	30
A20650C	Purvis Creek	480	130	24	A20651C	310	120	30
A20654C	Purvis Creek	420	130	24	A20655C	270	100	30

Table 1.17 Results of the Analysis for Mercury in Snails (Reference)
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Conc Hg ug/kg	MDL ug/kg	% Solids
Method Blank	Lab.	U	40	
1035-01	Reference	270	55	57
1035-02	Reference	450	91	35
1035-03	Reference	700	190	25
1035-04	Reference	590	90	30
1035-05	Reference	710	100	24
1035-06	Reference	870	130	16

Table 1.18 Results of the Analysis for Mercury in Snails
(Whole Body)
WA # 0–113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Conc Hg ug/kg	MDL ug/kg	% Solids
Method Blank	Lab.	U	40	
1311–01	LCP 5	27000	1200	27
1311–02	LCP 5	27000	790	30
1311–03	LCP 5	25000	830	28

Table 1.19 Results of the Analysis for Mercury in Snails
(Station #17-18)
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Conc Hg ug/kg	MDL ug/kg	% Solids
Method Blank	Lab.	U	40	
1036-01	LCP 17-18	39000	1300	24
1036-02	LCP 17-18	38000	1800	29
1036-03	LCP 17-18	33000	710	28
1036-04	LCP 17-18	33000	850	24
1036-05	LCP 17-18	32000	1300	24
1036-06	LCP 17-18	40000	1900	17
1036-07	LCP 17-18	17000	600	40

Table 1.20 Results of the Analysis for Mercury in Spartina Grass
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Conc Hg ug/kg	MDL ug/kg	% Solids
Method Blank 1	Lab	U	40	
A01541	LCP 35	9500	290	27
A01542	LCP Reference	U	140	28
A01544	LCP 17-18	1800	130	30

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Table 1.21 Results of the Analysis for Mercury in Turtle Carcasses
(no shell)
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Conc Hg ug/kg	MDL ug/kg	% Solids
Method Blank 2	Lab	U	40	
A01512	DD1	1800	95	28
A01513	DD2	7300	200	28
Method Blank	Lab	U	40	
A00572	DD 5	15000	420	13
A00574	DD 6	12000	520	22
1001	DD-4, Carcass	7600	180	24

Table 1.22 Results of the Analysis for Mercury in Turtle Livers
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Conc Hg ug/kg	MDL ug/kg	% Solids
Method Blank 2	Lab	U	40	
B01512	DD1	14000	440	24
B01513	DD2	100000	3400	28
Method Blank	Lab	U	40	
A00570	DD 5	180000	4200	13
Method Blank	Lab	U	40	
1003	DD-4, Liver	98000	3100	20

Table 1.23 Results of the Analysis for Mercury in Turtle Brains
WA # 0–113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Conc Hg ug/kg	MDL ug/kg
Method Blank 2	Lab	U	40
C01512 *	DD1	380 *	110 *
C01513 *	DD2	1600 *	220 *
Method Blank	Lab	U	40
A00571*	DD 5	3000 *	200 *
A00573*	DD 6	1300 *	250 *
Method Blank	Lab.	U	40
1002*	DD–4, Brain	1300 *	500 *

* denotes that the results are reported on a wet weight basis because there was insufficient sample for a percent solids determination

Table 1.24 Results of the Analysis for Mercury in Turtle Eggs
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Conc Hg ug/kg	MDL ug/kg	% Solids
Method Blank	Lab.	U	40	
A00617	DD 5	5400	110	34
A00575	DD 5	4000	92	41
A00576	DD 5	4600	96	41
A00606	DD 5	5500	120	32
A00612	DD 5	4700	87	39
A00615	DD 5	3800	79	38
A00616	DD 5	4000	81	45
052495	CO. Blank	U	0.02*	–
052595	CO. Blank	U	0.02*	–

* the units for this value are ug/sample

Table 1.25 Results of the Analysis for TAL Metals in Water
WA # 0-113 LCP Chemical Site

Client ID		Method Blank		D24163		G24161		C24162		G,H24164		D24166	
Location		Lab		LCP 45		LCP 43		LCP 44		LCP 46		LCP 17-18	
Parameter	Analysis Method	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL u
Aluminum	ICAP	U	50	1100	50	2700	50	460	50	1700	50	1700	50
Antimony	AA-Fur	U	2.2	U	11	U	11	U	11	U	11	U	11
Arsenic	AA-Fur	U	2.2	U	11	U	11	U	11	U	11	U	11
Barium	ICAP	U	5.0	31	5.0	34	5.0	33	5.0	33	5.0	41	5.0
Beryllium	ICAP	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
Cadmium	ICAP	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
Calcium	ICAP	U	100	270 *	2.0 *	280 *	2.0 *	270 *	2.0 *	300 *	2.0 *	290 *	2.0 *
Chromium	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
Cobalt	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
Copper	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
Iron	ICAP	U	25	710	25	1800	25	440	25	1600	25	1600	25
Lead	AA-Fur	U	2.2	U	11	34	11	16	11	U	11	20	11
Magnesium	ICAP	U	500	820 *	10 *	830 *	10 *	810 *	10 *	870 *	10 *	830 *	10 *
Manganese	ICAP	U	2.0	100	2.0	160	2.0	110	2.0	130	2.0	310	2.0
Mercury	Cold Vapor	U	0.20	0.40	0.20	0.50	0.20	0.20	0.20	0.40	0.20	3.0	0.20
Nickel	ICAP	U	10	U	10	U	10	U	10	U	10	U	10
Potassium	ICAP	U	2000	280 *	2.0 *	270 *	2.0 *	270 *	2.0 *	290 *	2.0 *	270 *	2.0 *
Selenium	AA-Fur	U	2.2	U	11	U	11	U	11	U	11	U	11
Silver	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
Sodium	ICAP	U	0.5*	6600 *	10 *	6700 *	10*	6500 *	10 *	6900 *	10 *	6500 *	10
Thallium	AA-Fur	U	2.2	U	11	U	11	U	11	U	11	U	11
Vanadium	ICAP	U	5.0	9.2	5.0	13	5.0	8.8	5.0	12	5.0	14	5.0
Zinc	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0

* denotes that the units for this value are milligrams per liter (mg/L)

Table 1.25 (Cont) Results of the Analysis for TAL Metals in Water
WA # 0-113 LCP Chemical Site

Client ID		C24168		D24165		E.F24167	
Location		LCP 35-36		LCP 10-11		LCP 19-20	
Parameter	Analysis Method	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l
Aluminum	ICAP	1100	50	820	50	1600	50
Antimony	AA-Fur	U	11	U	11	U	11
Arsenic	AA-Fur	U	11	U	11	U	11
Barium	ICAP	140	5.0	29	5.0	43	5.0
Beryllium	ICAP	U	2.0	U	2.0	U	2.0
Cadmium	ICAP	U	3.0	U	3.0	U	3.0
Calcium	ICAP	350 *	2.0 *	310 *	2.0 *	280 *	2.0 *
Chromium	AA-Fur	U	5.0	U	5.0	U	5.0
Cobalt	ICAP	U	5.0	U	5.0	U	5.0
Copper	ICAP	5.1	5.0	U	5.0	U	5.0
Iron	ICAP	1000	25	580	25	1600	25
Lead	AA-Fur	14	11	13	11	12	11
Magnesium	ICAP	790 *	10 *	930 *	10 *	800 *	10 *
Manganese	ICAP	65	2.0	47	2.0	180	2.0
Mercury	Cold Vapor	10	0.40	0.40	0.20	9.2	0.20
Nickel	ICAP	U	10	U	10	U	10
Potassium	ICAP	260 *	2.0 *	300 *	2.0 *	260 *	2.0 *
Selenium	AA-Fur	U	11	U	11	U	11
Silver	AA-Fur	U	5.0	U	5.0	U	5.0
Sodium	ICAP	6400 *	10 *	7200 *	10 *	6300 *	10 *
Thallium	AA-Fur	U	11	U	11	U	11
Vanadium	ICAP	12	5.0	9.4	5.0	12	5.0
Zinc	ICAP	U	5.0	U	5.0	U	5.0

* denotes that the units for this value are milligrams per liter (mg/L)

Table 1.25 (Cont) Results of the Analysis for TAL Metals in Water
WA # 0-113 LCP Chemical Site

Client ID		Method Blank		C24161		D24162		C24163		E24164		C24165	
Location		Lab		LCP 43		LCP 44		LCP 45		LCP 46		LCP 10-11	
Parameter	Analysis Method	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l
Aluminum	ICAP	U	50	U	50	U	50	U	50	U	50	U	50
Antimony	AA-Fur	U	2.2	U	11	U	11	U	11	U	11	U	11
Arsenic	AA-Fur	U	2.2	U	11	U	11	U	11	U	11	U	11
Barium	ICAP	U	5.0	78	5.0	78	5.0	77	5.0	39	5.0	28	5.0
Beryllium	ICAP	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
Cadmium	ICAP	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
Calcium	ICAP	U	100	270 *	2.0 *	290 *	2.0 *	280 *	2.0 *	270 *	2.0 *	290 *	2.0 *
Chromium	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
Cobalt	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
Copper	ICAP	U	5.0	U	5.0	U	5.0	17	5.0	U	5.0	U	5.0
Iron	ICAP	U	25	58	25	81	25	60	25	48	25	35	25
Lead	AA-Fur	U	2.2	20	11	15	11	U	11	U	11	U	11
Magnesium	ICAP	U	500	790 *	10 *	860 *	10 *	820 *	10 *	830 *	10 *	860 *	10 *
Manganese	ICAP	U	2.0	100	2.0	96	2.0	80	2.0	80	2.0	19	2.0
Mercury	Cold Vapor	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20
Nickel	ICAP	U	10	U	10	11	10	U	10	U	10	U	10
Potassium	ICAP	U	2000	270 *	2.0 *	270 *	2.0 *	270 *	2.0 *	270 *	2.0 *	280 *	2.0 *
Selenium	AA-Fur	U	2.2	U	11	U	11	U	11	U	11	U	11
Silver	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
Sodium	ICAP	U	500	6200 *	10 *	6600 *	10 *	6300 *	10 *	6800 *	10 *	6800 *	10 *
Thallium	AA-Fur	U	2.2	U	11	U	11	U	11	U	11	U	11
Vanadium	ICAP	U	5.0	10	5.0	10	5.0	9.3	5.0	10	5.0	13	5.0
Zinc	ICAP	U	5.0	13	5.0	17	5.0	32	5.0	U	5.0	U	5.0

* denotes that the units for this value are milligrams per liter (mg/L)

Table 1.25 (Cont) Results of the Analysis for TAL Metals in Water
WA # 0-113 LCP Chemical Site

Client ID		C24166		G24167		D24168		A20613		A20612	
Location		LCP 17-18		LCP 19-20		LCP 35-36		Reference		Reference	
Parameter	**Analysis Method**	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l	Conc ug/l	MDL ug/l
Aluminum	ICAP	U	50	U	50	U	50	U	50	650	50
Antimony	AA-Fur	U	11	U	11	U	11	U	11	U	11
Arsenic	AA-Fur	U	11	U	11	U	11	U	11	U	11
Barium	ICAP	82	5.0	79	5.0	170	5.0	96	5.0	40	5.0
Beryllium	ICAP	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0
Cadmium	ICAP	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0
Calcium	ICAP	290 *	2.0 *	260 *	2.0 *	310 *	2.0 *	190 *	2.0 *	210 *	1.0 *
Chromium	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
Cobalt	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
Copper	ICAP	U	5.0	U	5.0	U	5.0	8.8	5.0	U	5.0
Iron	ICAP	100	25	72	25	30	25	U	25	380	25
Lead	AA-Fur	U	11	U	11	U	11	U	11	U	11
Magnesium	ICAP	850 *	10 *	770 *	10 *	750 *	10 *	590 *	10 *	630 *	5.0 *
Manganese	ICAP	230	2.0	110	2.0	22	2.0	23	2.0	36	2.0
Mercury	Cold Vapor	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20
Nickel	ICAP	U	10	U	10	U	10	U	10	U	10
Potassium	ICAP	270 *	2.0 *	250 *	2.0 *	260 *	2.0 *	190 *	2.0 *	190 *	2.0 *
Selenium	AA-Fur	U	11	U	11	U	11	U	11	U	11
Silver	ICAP	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0
Sodium	ICAP	6800 *	10 *	6300 *	10 *	6300 *	10 *	4700 *	10 *	4900 *	5.0 *
Thallium	AA-Fur	U	11	U	11	U	11	U	11	U	11
Vanadium	ICAP	9.4	5.0	6.4	5.0	12	5.0	5.8	5.0	7.6	5.0
Zinc	ICAP	14	5.0	7	5.0	22	5.0	38	5.0	U	5.0

* denotes that the units for this value are milligrams per liter (mg/L)

Table 1.26 Results of the Analysis for TAL Metals in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID / Location		Method Blank Lab		J01508 Reference		A01510 SED 35		K01546 SED 19-20		K01540 SED 36		J01545 SED 17-18	
Parameter	**Analysis Method**	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	ICAP	U	10	22000	28	19000	14	23000	21	20000	21	18000	15
Antimony	ICAP	U	6.0	U	17	U	8.4	U	13	U	13	U	9.2
Arsenic	AA-Fur	U	0.50	9.3	1.5	10	1.3	8.8	0.88	7.4	1.1	6.5	0.69
Barium	ICAP	U	4.0	39	11	36	5.6	35	8.6	50	8.6	23	6.2
Beryllium	ICAP	U	0.20	1.6	0.80	1.5	0.30	1.5	0.40	1.3	0.40	1.4	0.30
Cadmium	ICAP	U	0.30	U	0.80	U	0.40	U	0.60	U	0.60	U	0.50
Calcium	ICAP	U	50	2700	140	3900	70	7600	110	9200	110	2500	77
Chromium	ICAP	U	0.80	36	2.3	78	1.1	40	1.7	85	1.7	75	1.2
Cobalt	ICAP	U	2.0	8.6	5.6	10	2.8	9.7	4.3	12	4.3	6.5	3.1
Copper	ICAP	U	0.60	13	1.7	33	0.80	25	1.3	71	1.3	14	0.90
Iron	ICAP	U	9.0	31000	25	27000	13	31000	19	26000	19	22000	14
Lead	ICAP	U	4.0	24	11	50	5.6	71	8.6	75	8.6	33	6.2
Magnesium	ICAP	U	50	6400	140	8100	70	6500	110	9400	110	6100	77
Manganese	ICAP	U	1.4	580	3.9	740	2	290	3.0	360	3.0	420	2.2
Mercury	Cold Vapor	U	0.04	0.13	0.12	90	3.8	170	4.1	230	4.9	15	0.69
Nickel	ICAP	U	2.0	9.8	5.6	15	2.8	15	4.3	22	4.3	9.7	3.1
Potassium	ICAP	U	200	3000	560	3400	280	3300	430	3200	430	2900	310
Selenium	AA-Fur	U	0.50	U	1.5	U	1.3	U	0.88	U	1.1	U	0.69
Silver	ICAP	U	0.50	U	1.4	U	0.70	U	1.1	U	1.1	U	0.8
Sodium	ICAP	U	50	17000	140	19000	70	14000	110	19000	110	16000	77
Thallium	AA-Fur	U	0.50	U	1.5	U	1.3	U	0.88	U	1.1	U	0.69
Vanadium	ICAP	U	2.0	58	5.6	67	2.8	55	4.3	68	4.3	56	3.1
Zinc	ICAP	U	2.0	68	5.6	99	2.8	84	4.3	150	4.3	59	3.1

Table 1.26 (Cont) Results of the Analysis for TAL Metals in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID		Method Blank		J24164		D24161		F24162		G24163	
Location		Lab		LCP 46		LCP 43		LCP 44		LCP 45	
Parameter	Analysis Method	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	ICAP	20	10	22000	15	15000	15	20000	12	25000	16
Antimony	ICAP	U	6	U	8.8	U	9.0	U	6.9	U	9.8
Arsenic	AA-Fur	U	0.5	9.3	1.2	7.6	0.85	7.9	0.90	5.6	0.70
Barium	ICAP	U	4	29	5.9	21	6.0	26	4.6	30	6.5
Beryllium	ICAP	U	0.2	1.5	0.3	1.2	0.30	1.4	0.20	1.6	0.30
Cadmium	ICAP	U	0.3	U	0.4	U	0.50	U	0.30	U	0.50
Calcium	ICAP	U	50	5100	73	5400	75	2700	58	3100	81
Chromium	ICAP	U	0.8	84	1.2	66	1.2	120	0.90	89	1.3
Cobalt	ICAP	U	2	7.8	2.9	5.6	3.0	6.6	2.3	7.5	3.3
Copper	ICAP	U	0.6	12	0.9	9.6	0.90	14	0.70	13	1.0
Iron	ICAP	23	9	26000	13	24000	14	21000	10	26000	15
Lead	ICAP	U	4	30	5.9	26	6.0	35	4.6	31	6.5
Magnesium	ICAP	U	50	7600	73	6700	75	6700	58	7500	81
Manganese	ICAP	U	1.4	620	2.1	590	2.1	450	1.6	440	2.3
Mercury	Cold Vapor	U	0.04	2.7	0.08	2	0.07	8.2	0.33	3.6	0.22
Nickel	ICAP	U	2	12	2.9	8.9	3.0	11	2.3	13	3.3
Potassium	ICAP	U	200	3600	290	3100	300	3400	230	3700	330
Selenium	AA-Fur	U	0.5	U	1.2	U	1.7	U	1.8	U	1.4
Silver	ICAP	U	0.5	U	0.7	U	0.80	U	0.60	U	0.80
Sodium	ICAP	U	50	21000	73	23000	75	21000	58	21000	81
Thallium	AA-Fur	U	0.5	U	0.62	U	0.85	U	0.90	U	0.70
Vanadium	ICAP	U	2	62	2.9	50	3.0	64	2.3	69	3.3
Zinc	ICAP	3.4	2	67	2.9	50	3.0	61	2.3	71	3.3

Table 1.26 (Cont) Results of the Analysis for TAL Metals in Sediment
WA # 0–113 LCP Chemical Site
Based on Dry Weight

Client ID		Method Blank		1050A		1051A		1052A		1053A		1055A	
Location		Lab		LCP47		LCP48		LCP49		LCP50		LVP51	
Parameter	Analysis Method	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	ICAP	U	10	16000	15	17000	16	19000	14	18000	14	14000	24
Antimony	ICAP	U	6.0	U	9.0	U	9.7	U	8.5	U	8.7	U	14
Arsenic	AA–Fur	U	0.50	6.9	1.3	5.5	0.74	4.9	0.86	5.1	0.57	8.4	1.2
Barium	ICAP	U	4.0	35	6.0	30	6.4	22	5.7	21	5.8	31	9.6
Beryllium	ICAP	U	0.20	1.1	0.30	1.1	0.30	1.2	0.30	1.2	0.30	0.71	0.50
Cadmium	ICAP	U	0.30	0.55	0.40	U	0.50	U	0.40	U	0.40	U	0.70
Calcium	ICAP	U	50	2700	75	3100	80	3200	71	2400	72	5600	120
Chromium	ICAP	U	0.80	82	1.2	91	1.3	94	1.1	40	1.2	66	1.9
Cobalt	ICAP	U	2.0	6.5	3.0	7.8	3.2	5.7	2.8	5.5	2.9	6	4.8
Copper	ICAP	U	0.60	24	0.90	21	1.0	20	0.80	14	0.90	56	1.4
Iron	ICAP	U	9.0	16000	13	15000	14	19000	13	20000	13	14000	22
Lead	ICAP	U	4.0	130	6.0	110	6.4	81	5.7	140	5.8	220	9.6
Magnesium	ICAP	U	50	5300	75	6000	80	6200	71	5800	72	6700	120
Manganese	ICAP	U	1.4	280	2.1	470	2.3	160	2.0	270	2.0	77	3.4
Mercury	Cold Vapor	U	0.04	8.4	0.29	9.3	0.26	6.3	0.22	11	0.80	330	8.9
Nickel	ICAP	U	2.0	11	3.0	13	3.2	13	2.8	9.4	2.9	17	4.8
Potassium	ICAP	U	200	2600	300	2900	320	3200	280	3200	290	2500	480
Selenium	AA–Fur	U	0.50	U	1.3	U	1.5	U	1.3	U	1.1	U	2.4
Silver	ICAP	U	0.50	U	0.70	U	0.80	U	0.70	U	0.70	U	1.2
Sodium	ICAP	U	50	14000	75	17000	80	17000	71	18000	72	23000	120
Thallium	AA–Fur	U	0.50	U	0.64	U	0.74	U	0.86	U	0.57	U	1.2
Vanadium	ICAP	U	2.0	51	3.00	58	3.2	54	2.8	46	2.9	45	4.8
Zinc	ICAP	U	2.0	110	3.00	120	3.2	86	2.8	56	2.9	160	4.8

Table 1.26 (Cont) Results of the Analysis for
TAL Metals in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID		K24160	
Location		LCP 10-11	
Parameter	Analysis Method	Conc mg/kg	MDL mg/kg
Aluminum	ICAP	20000	8.5
Antimony	ICAP	U	5.1
Arsenic	AA-Fur	5.4	0.61
Barium	ICAP	27	3.4
Beryllium	ICAP	1.3	0.20
Cadmium	ICAP	U	0.30
Calcium	ICAP	3400	42
Chromium	ICAP	65	0.70
Cobalt	ICAP	6.1	1.7
Copper	ICAP	16	0.50
Iron	ICAP	22000	7.6
Lead	ICAP	35	3.4
Magnesium	ICAP	6100	42
Manganese	ICAP	290	1.2
Mercury	Cold Vapor	34	2.2
Nickel	ICAP	12	1.7
Potassium	ICAP	3100	170
Selenium	AA-Fur	U	1.2
Silver	ICAP	U	0.40
Sodium	ICAP	16000	42
Thallium	AA-Fur	U	0.61
Vanadium	ICAP	54	1.7
Zinc	ICAP	63	1.7

Table 1.27 Results of the Analysis for Lead and Mercury in Sediment Samples
WA # 0-113 LCP Chemical Site
Based on Dry Weight (except as marked)

Client ID	Parameter Analysis Method / Location	Lead ICAP Conc mg/kg	Lead ICAP MDL mg/kg	Mercury AA-cold vapor Conc mg/kg	Mercury AA-cold vapor MDL mg/kg
Method Blank	Lab	U	4.0	U	0.04
SD3 DUP	Sta. 3	130	3.9	7.8	0.39
SD4	Sta. 4	150	4.0	190	4.0
SD5	Sta. 5	200	4.0	340	40
WET 5	Sta. 5	42 *	3.7 *	78 *	4.1 *
WET 19	Sta. 19	28 *	3.8 *	100 *	2.9 *
SED 24	Sta. 24	23 *	3.3 *	65 *	4.2 *
SED 25	Sta. 25	18 *	3.5 *	75 *	4.2 *
SED 33	Sta. 33	25 *	3.7 *	45 *	4.3 *
SED 44	Sta. 44	11 *	3.7 *	1.7 *	0.06 *
OUTFALL	Lagoon Outfall	18 *	4.0 *	39 *	3.5 *

* – Reported results are on wet weight basis

Table 1.28 Results of the Analysis for Organic Mercury
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample Id	Location	Methyl Mercury mg/kg	MDL Methyl Mercury mg/kg	Dimethyl/ Ethyl Mercury mg/kg	MDL Dimethyl/ Ethyl Mercury mg/kg
Blank		U	0.00140	U	0.00559
A 00570	DD5	20.2	0.3216	U	0.00643
A 00572	DD5	5.89	0.0125	U	0.00500
A 00574	DD6	6.18	0.0144	U	0.00577
A 01541	ST # 35	0.320	0.00131	U	0.00523
A 01553	Reference	0.221	0.0126	U	0.00504
A 1560 C	Reference	0.0677	0.0119	U	0.00474
A 03121	Purvis Creek	4.93	0.0165	U	0.00329
A 03123	Purvis Creek	6.73	0.0120	U	0.00239
1016-06	ST # 10	0.250	0.0118	U	0.00235
103601	ST # 17	0.0516	0.0165	U	0.00329
A 2061102	ST # 17	0.325	0.0173	U	0.00345
A 2557406	Outfall	0.483	0.0102	U	0.00204
B 01543 C	Purvis Creek	0.293	0.0194	U	0.00389

Should read "A 20611-02"

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Table 1.29 Results of the Analysis for Oil and Grease and Petroleum Hydrocarbons
WA # 0-113 LCP Chemical
(Based on Dry Weight)

Sample ID	Location	OIL & GREASE (mg/kg)		PETROLEUM HYDROCARBONS (mg/kg)		QL (mg/kg)
SBLK05249503	–	U		U		20
JK 24164	LCP 46	U		U		220
D 24161	LCP 43	U		U		240
F 24162	LCP 44	U		U		230
G 24163	LCP 45	U		U		230
SBLK052395	–	U		U		20
J 01508	REFERENCE	200		U		91
AB 01510	SED 35	230		U		63
K 01546	SED 19 – 20	560		557		60
K01540	SED 36	1400		1300		66
J 01545	SED 17 – 18	170		U		60
SBLK060195	–	7.3	J	U		20
1050 A	LCP 47	195		114		62
1051 A	LCP 48	33	J	24	J	71
1052 A	LCP 49	68	J	51	J	91
1053 A	LCP 50	871		472		76
1055 A	LCP 51	81	J	U		551
K24160	LCP 10–11	117		58	J	68

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Table 1.30 Results of the Total Organic Carbon Analysis
WA # 0-113 LCP Chemical Site

Sample ID	Location	Total Organic Carbon %
A-H 01508	Reference	3.61
I 24160	LCP 10-11	4.16
E 24161	LCP 43	2.97
E 24162	LCP 44	4.52
E 24163	LCP 45	3.06
I 24164	LCP 46	4.42
I 01545	SED 17-18	1.27
A 01546	SED 19-20	0.78
C 01510	SED 35	1.73
A 01540	SED 36	0.36
1050 B	LCP 47	32.75
1051 B	LCP 48	31.01
1052 B	LCP 49	21.01
1053 B	LCP 50	24.66
1055 B	LCP 51	34.22

QA/QC for Creosote Compounds

Before extraction, each sample was spiked with a six component mixture of CLP surrogate standards consisting of nitrobenzene-d_5, 2-fluorobiphenyl, terphenyl-d_{14}, phenol-d_5, 2-fluorophenol, and 2,4,6-tribromophenol. The surrogate percent recoveries, listed in Table 2.1, ranged from 29 to 104. All one hundred and thirty-two values were within the acceptable QC limits.

The internal standard areas (for 1,4-dichlorobenzene-d_4, naphthalene-d_8, acenaphthene-d_{10}, phenanthrene-d_{10}, chrysene-d_{12}, perylene-d_{12}) are listed in Table 2.1. One hundred and nineteen areas out of one hundred and thirty-two were within the acceptable QC limits.

Samples JK 24164 and AB 01510 were chosen for the matrix spike/matrix spike duplicate analyses. The percent recoveries, ranging from 43 to 145, are listed in Table 2.2. Twenty-two values out of forty-four were within the acceptable QC limits. The relative percent differences, also listed in Table 2.2, ranged from 0 (zero) to 51. One relative percent difference exceeded the acceptable QC limits.

Table 2.1 Results of the Internal Standard Areas and Surrogate Recoveries
WA # 0-113 LCP Chemical Site

			Internal Standards			Surrogates		
			1	2	3	NBZ	FBP	TPH
		Data	4	5	6	PHL	2FP	TBP
	Sample #	File	area	area	area	%	%	%
CAL CHECK	50 ppm Cre	>LCP06	39261	158359	108540	NA	NA	NA
			193289	220112	245280	NA	NA	NA
	SBLK024950	>LCP12	26452	105436	72511	79	86	86
			142343	178562	208416	92	84	81
	JK24164	>LCP13	26709	97025	64676	81	95	92
			136956	176023	192742	86	86	97
	JK24164 MS	>LCP14	28152	109439	73330	74	86	86
			143219	180410	201202	84	73	89
	JK24164 MSD	>LCP15	25432	92466	61798	85	89	86
			121650	148472	176680	91	88	92
	D24161	>LCP16	22964	85341	57164	79	87	84
			110901	141969	161531	87	89	73
	F24162	>LCP17	26610	100774	65575	77	91	95
			126772	153397	171713	85	78	70

CAL CHECK	50 ppm cal	>LCP24	35662	132411	82970	NA	NA	NA
			139729	158778	175454	NA	NA	NA
	G24163	>LCP25	22818	83369	56436	61	73	77
			95913	110008	125906	68	70	55
	SBLK052595	>LCP26	24357	93539	57912	66	86	86
			107059	131881	154168	73	58	45
	1050A	>LCP27	28606	103640	62990	62	85	89
			107666	103619	112100	69	65	85
	1051A	>LCP28	27336	94242	57293	70	94	93
			101542	86462	83402*A	69	70	77
	1052A	>LCP29	27670	110892	64254	71	84	64
			99421	75113*A	67842*A	81	77	55

SURROGATE LIMITS	SOIL
S1 (NBZ) = Nitrobenzene-d5	(23-120)
S2 (FBP) = 2-Fluorobiphenyl	(30-115)
S3 (TPH) = Terphenyl-d14	(18-137)
S4 (PHL) = Phenol-d5	(24-113)
S5 (2FP) = 2-Fluorophenol	(25-121)
S6 (TBP) = 2,4,6-Tribromophenol	(19-122)

Table 2.1 (Cont) Results of the Internal Standard Areas and Surrogate Recoveries
WA # 0-113 LCP Chemical Site

Sample #	Data File	Internal Standards 1 / 4 area	2 / 5 area	3 / 6 area	Surrogates NBZ / PHL %	FBP / 2FP %	TPH / TBP %
CAL CHECK 50 ppm St	>LCP36	31975 132119	132457 121208	71902 118132	NA NA	NA NA	NA NA
SBLK052395	>LCP41	22558 87909	91483 100659	50107 123342	74 85	83 85	91 75
AB01510	>LCP42	27401 117464	111930 138479	66085 145389	78 97	83 94	88 95
AB01510 MS	>LCP43	32079 124429	127383 144993	71778 162124	81 90	86 89	93 104
AB01510 MSD	>LCP44	30598 121172	115920 149566	70614 155184	78 88	89 88	88 101
J01508	>LCP45	26155 89758	99547 59791*A	57905 61061	67 80	73 76	79 83
K01546	>LCP46	30577 93485	106325 99080	63278 72255	80 76	82 76	88 63
K01540	>LCP47	25864 81383	100203 58413*A	60832 46290*A	68 81	65 77	69 59
J01545	>LCP48	23799 81931	87474 79818	48595 64036	72 70	74 83	65 42
1053A R	>LCP49	23411 70033	93964 61182*A	51918 41783*A	70 79	68 84	77 49
1055A R	>LCP50	29697 85252	114569 45174*A	69159 34117*A	69 73	51 74	61 37
K24160 R	>LCP51	19993 60715*A	82775 34191*A	42077 26132*A	65 82	60 80	76 29

SURROGATE LIMITS	SOIL
S1 (NBZ) = Nitrobenzene-d5	(23-120)
S2 (FBP) = 2-Fluorobiphenyl	(30-115)
S3 (TPH) = Terphenyl-d14	(18-137)
S4 (PHL) = Phenol-d5	(24-113)
S5 (2FP) = 2-Fluorophenol	(25-121)
S6 (TBP) = 2,4,6-Tribromophenol	(19-122)

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Table 2.2 Results of MS/MSD Analysis
WA # 0–113 LCP Chemical Site

Sample ID: J K 24164

Compound Name	Sample Conc. ug/Kg	MS Spike Added ug/Kg	MSD Spike Added ug/Kg	MS Conc. ug/Kg	MSD Conc. ug/Kg	MS % Rec.	MSD % Rec.	% RPD	QC Limits RPD	QC Limits % Rec.
Phenol	U	29900	29900	26900	29100	90	97 *	8	35	26 – 90
2–Chlorophenol	U	29900	29900	27800	29100	93	97	5	50	25 – 102
1,4–Dichlorobenzene	U	14900	14900	12700	13400	85	90	5	27	28 – 104
N–Nitroso–Di–N–Propylamine	U	14900	14900	11100	13300	75	89	18	38	41 – 126
1,2,4–Trichlorobenzene	U	14900	14900	12700	14900	85	100	16	23	38 – 107
4–Chloro–3–Methylphenol	U	29900	29900	29300	31400	98	105 *	7	33	26 – 103
Acenaphthene	U	14900	14900	18400	19000	123	128	3	19	31 – 137
4–Nitrophenol	U	29900	29900	42500	43300	142 *	145 *	2	50	11 – 114
2,4–Dinitrotoluene	U	14900	14900	17100	16600	115 *	111 *	3	47	28 – 89
Pentachlorophenol	U	29900	29900	21300	12700	71	43	51 *	47	17 – 109
Pyrene	239	14900	14900	18400	20100	122	133	9	36	35 – 142

Sample ID AB01510

Compound Name	Sample Conc. ug/Kg	MS Spike Added ug/Kg	MSD Spike Added ug/Kg	MS Conc. ug/Kg	MSD Conc. (ug/Kg	MS % Rec.	MSD % Rec.	% RPD	QC Limits RPD	QC Limits % Rec.
Phenol	U	10300	10300	10200	10800	99 *	105 *	6	35	26 – 90
2–Chlorophenol	U	10300	10300	10000	9420	97	92	6	50	25 – 102
1,4–Dichlorobenzene	U	5170	5170	4170	4390	81	85	5	27	28 – 104
N–Nitroso–Di–N–Propylamine	U	5170	5170	4390	4000	85	77	9	38	41 – 126
1,2,4–Trichlorobenzene	U	5170	5170	4660	5100	90	99	9	23	38 – 107
4–Chloro–3–Methylphenol	U	10300	10300	10500	11600	102	113 *	10	33	26 – 103
Acenaphthene	U	5170	5170	5730	5640	111	109	2	19	31 – 137
4–Nitrophenol	U	10300	10300	13800	13800	134 *	134 *	0	50	11 – 114
2,4–Dinitrotoluene	U	5170	5170	5630	5760	109 *	111 *	2	47	28 – 89
Pentachlorophenol	U	10300	10300	6690	6210	65	60	7	47	17 – 109
Pyrene	106	5170	5170	5460	5950	104	113	9	36	35 – 142

QA/QC for PCBs in Water and Sediment

Each sample was spiked with a solution of tetrachloro-m-xylene and decachlorobiphenyl as surrogates. The percent recoveries ranged from 13 to 107 for the water samples and are listed in Table 2.3. Four out of twenty values were within the acceptable QC limits. Ten other values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with one of the components of Aroclor 1268. The percent recoveries ranged from 48 to 108 for the soil and sediment samples and are listed in Table 2.4. Twenty out of twenty-four values were within the acceptable QC limits. Eighteen other values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with one of the components of Aroclor 1268.

Samples A-D 24164 and A,B 1037 were chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses for the water samples. The percent recoveries, ranging from 90 to 119, are listed in Table 2.5. The relative percent differences (RPDs) were 14 and 15. QC limits are not available for the percent recoveries or the RPDs for Aroclors in water samples.

Samples K 01546 and J,K 24164 were chosen for the MS/MSD analyses for the soil and sediment samples. The percent recoveries, listed in Table 2.6, were not calculated for K 01546 because of the high concentration of Aroclor 1268. The RPDs, also listed in Table 2.6 were not calculated. QC limits are not available for the percent recoveries or the RPDs for Aroclors in soil or sediment samples.

Table 2.3 Results of the Surrogate Recoveries in Water
WA # 0-113 LCP Chemicals

Sample ID	Percent Recovery TCMX	DCBP
WBLK052495	30 *	54 *
A.B24165	35 *	NC
A-D24167	25 *	NC
A.B24168	13 *	NC
A.B24166	18 *	NC
A.B24163	18 *	NC
A-D24164	27 *	NC
A-D24164 MS	26 *	NC
A-D24164 MSD	31 *	NC
A-B24162	18 *	NC
A-B24161	18 *	NC
WBLK052695	35 *	84
A.B1037	40 *	88
A.B1037 MS	48 *	91
A.B1037 MSD	43 *	107

NC denotes that the percent recoveries of decachlorobiphenyl were not calculated because of coelution with Aroclor 1268

TCMX denotes tetrachloro-m-xylene

DCBP denotes decachlorobiphenyl

	Advisory QC Limits
TCMX	60-150
DCBP	60-150

Table 2.4 Results of the Surrogate Recoveries in Sediment
WA # 0-113 LCP Chemicals

Sample ID	Percent Recovery TCMX	DCBP
SBLK05229502	108	105
J01508	66	NC
AB01510	69	NC
K01546	54 *	NC
K01546 MS	48 *	NC
K01546 MSD	54 *	NC
K01540	60	NC
J01545	90	NC
SBLK05269502	88	110
1050A	74	NC
1051A	67	NC
1052A	78	NC
1053A	53 *	NC
1055A	83	NC
SBLK05259502	72	106
JK24164	83	NC
JK24164 MS	85	NC
JK24164 MSD	94	NC
D24161	97	NC
F24162	88	NC
G24163	88	NC

NC denotes that the percent recoveries of decachlorobiphenyl were not calculated because of coelution with Aroclor 1268
TCMX denotes tetrachloro-m-xylene
DCBP denotes decachlorobiphenyl

	Advisory QC Limits
TCMX	60-150
DCBP	60-150

Table 2.5 Results of the MS/MSD Analysis for PCB in Water
WA # 0-113 LCP Chemicals

Sample ID A-D 24164

Compound	Sample Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MS % Rec	MSD Spike Added ug/l	MSD Conc ug/l	MSD % Rec	RPD
Aroclor 1260	U	1.11	1.32	119	1.11	1.14	103	15

Sample ID A.B 1037

Compound	Sample Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MS % Rec	MSD Spike Added ug/l	MSD Conc ug/l	MSD % Rec	RPD
Aroclor 1260	U	1.54	1.38	90	1.54	1.59	103	14

Table 2.6 Results of the MS/MSD Analysis for PCB in Sediment
WA # 0-113 LCP Chemicals

Sample ID K01546

Compound	Sample Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MS % Rec	MSD Spike Added ug/kg	MSD Conc ug/kg	MSD % Rec	RPD
Aroclor 1260	U	499	–	NC	499	–	NC	NC

Sample ID J K24164

Compound	Sample Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MS % Rec	MSD Spike Added ug/kg	MSD Conc ug/kg	MSD % Rec	RPD
Aroclor 1260	U	1831	2284	125	1831	2609	142	13

QA/QC for PCBs in Tissue

Each sample was spiked with a solution of tetrachloro-m-xylene and decachlorobiphenyl as surrogates. The percent recoveries for the method blanks ranged from 23 to 90 and are listed in Table 2.7. Nine values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with one of the decachlorobiphenyl components of Aroclor 1268. QC limits are not available for surrogates in tissue.

The percent recoveries for the blue claw crabs ranged from 28 to 83 and are listed in Table 2.8. Seventy values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with a decachlorobiphenyl isomer of Aroclor 1268. QC limits are not available for surrogates in tissue.

The percent recoveries for the fiddler crabs ranged from 39 to 72 and are listed in Table 2.9. Twenty-eight values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with a decachlorobiphenyl isomer of Aroclor 1268. QC limits are not available for surrogates in tissue.

The percent recoveries for the brown shrimp ranged from 27 to 66 and are listed in Table 2.10. Seventy-five values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with a decachlorobiphenyl isomer of Aroclor 1268. QC limits are not available for surrogates in tissue.

The percent recoveries for the snails ranged from 54 to 77 and are listed in Table 2.11. Eighteen values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with a decachlorobiphenyl isomer of Aroclor 1268. QC limits are not available for surrogates in tissue.

The percent recoveries for spartina alterniflora ranged from 51 to 59 and are listed in Table 2.12. Five values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with a decachlorobiphenyl isomer of Aroclor 1268. QC limits are not available for surrogates in plant tissue.

The percent recoveries for diamond back terrapins ranged from 46 to 78 and are listed in Table 2.13. Seventeen values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with a decachlorobiphenyl isomer of Aroclor 1268. QC limits are not available for surrogates in tissue.

Samples A 01512, A 01515, B 01520, A 20628 C, A 03123, A 01999, A 01521 C, A 20629 C, B 03124 1007, A 01544, A 01995, A 01553, A 01992, A 01997, 1005 and 1036-07 were chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, ranging from 59 to 102, are listed in Table 2.14. The relative percent differences (RPDs), also listed in Table 2.14, ranged from 0 (zero) to 11. QC limits are not available for the percent recoveries or the RPDs for Aroclors in tissue samples.

Table 2.7 Results of the Surrogate Recoveries for Tissue Blanks
WA # 0-113 LCP Chemicals

Sample ID	Percent Recovery TCMX	Percent Recovery DCBP
Meth Blk 052095 CL	60	80
Meth Blk 052095 TL	68	90
Meth Blk 052195 CL	23	98
Meth Blk 052195 TL	42	120
Meth Blk 052495 CL	68	59
Meth Blk 052495 TL	60	53
Meth Blk 052595 TL	52	57
Meth Blk 052695 CL	37	38
Meth Blk 052695 TL	63	54
Meth Blk 053095 CL	67	52
Meth Blk 053095 TL	61	55
Meth Blk 053195 TL	44	46

TCMX denotes tetrachloro-m-xylene
DCBP denotes decachlorobiphenyl

Table 2.8 Results of the Surrogate Recoveries for Blue Claw Crabs
WA # 0--113 LCP Chemicals

Sample ID	Percent Recovery TCMX	Percent Recovery DCBP
A 01515	57	NC
A 01515 MS	62	NC
A 01515 MSD	54	NC
A 01516	69	NC
B 01518	61	NC
A 01514	56	NC
A 03121	51	NC
A 03123	49	NC
A 03123 MS	41	NC
A 03123 MSD	37	NC
B 03124	48	NC
B 03124 MS	35	NC
B 03124 MSD	47	NC
A 03122	46	NC
1231	54	NC
1232	51	NC
A 01997	31	NC
A 01997 MS	42	NC
A 01997 MSD	39	NC
A 01998	49	NC
A 01999	38	NC
A 01999 MS	51	NC
A 01999 MSD	51	NC
A 03125	45	NC
A 02000	28	NC
1006	45	NC
1007	48	NC
1007 MS	45	NC
1007 MSD	46	NC
1004	50	NC
1005	45	NC
1005 MS	45	NC
1005 MSD	46	NC
A 01551	40	NC
A 03126	51	NC
A 01552	47	NC
A 01553	50	NC
A 01553 MS	49	NC
A 01553 MSD	49	NC
1235	57	NC
1233	54	NC
1234	59	NC
A 01995	35	NC
A 01995 MS	41	NC
A 01995 MSD	45	NC
A 01994	42	NC
A 01996	47	NC
A 01992	51	NC
A 01992 MS	49	NC
A 01992 MSD	45	NC
A 01993	38	NC
A 01519	53	NC
A 01517	61	NC

NC denotes Not Calculated due to coelution with Aroclor 1268
TCMX denotes tetrachloro-m-xylene
DCBP denotes decachlorobiphenyl

Table 2.8 (Cont) Results of the Surrogate Recoveries for Blue Claw Crabs
WA # 0-113 LCP Chemicals

Sample ID	Percent Recovery TCMX	DCBP
A 00570	83	NC
1237	46	NC
1303	43	NC
1229	42	NC
1305	48	NC
1306	46	NC
1227	44	NC
1228	35	NC
1238	39	NC
1302	35	NC
1304	45	NC
1230	41	NC
1236	46	NC
1285	53	NC
1284	46	NC
1287	58	NC
1286	51	NC
1289	64	NC
1288	48	NC
1293	51	NC
1292	43	NC
1295	50	NC
1294	49	NC
1297	55	NC
1296	51	NC
1299	51	NC
1298	51	NC
1301	41	NC

NC denotes Not Calculated due to coelution with Aroclor 1268
TCMX denotes tetrachloro-m-xylene
DCBP denotes decachlorobiphenyl

Table 2.9 Results of the Surrogate Recoveries for Fiddler Crabs
WA # 0–113 LCP Chemicals

Sample ID	Percent Recovery TCMX	Percent Recovery DCBP
A 25574–01	58	NC
A 25574–02	50	NC
A 25574–03	48	NC
A 25574–04	52	NC
A 25574–05	58	NC
A 25574–06	72	NC
A 25574–07	51	NC
A 01543	47	NC
A 20611–01	47	NC
A 20611–02	43	NC
A 20611–03	52	NC
A 20611–04	45	NC
A 20611–05	47	NC
A 20610–01	63	NC
A 20610–02	59	NC
A 20610–03	61	NC
A 20610–04	53	NC
A 20610–05	57	NC
A 20610–06	46	NC
A 20610–07	52	NC
A 20611–07	57	NC
A 20611–06	53	NC
1016–02	48	NC
1016–03	41	NC
1016–01	39	NC
1016–04	50	NC
1016–05	48	NC
1016–06	51	NC

NC denotes Not Calculated due to coelution with Aroclor 1268
TCMX denotes tetrachloro–m–xylene
DCBP denotes decachlorobiphenyl

Table 2.10 Results of the Surrogate Recoveries for Brown Shrimp
WA # 0-113 LCP Chemicals

Sample ID	Percent Recovery TCMX	DCBP
A 20643 C	61	NC
A 01504	65	NC
A 20655 C	52	NC
A 20646 C	57	NC
A 01507 C	58	NC
A 20636 C	50	NC
A 20642 C	53	NC
A 20650 C	55	NC
A 20654 C	52	NC
A 19763 C	54	NC
B 01520 C	55	NC
B 01520 C MS	35	NC
B 01520 C MSD	28	NC
A 20637 C	49	NC
A 20647 C	56	NC
A 20651 C	56	NC
A 19764 C	51	NC
A 01505	55	NC
B 01521 C	52	NC
B 01521 C MS	46	NC
B 01521 C MSD	45	NC
B 01526 C	44	NC
B 01530 C	36	NC
B 01534 C	38	NC
B 01537	45	NC
B 01527 C	58	NC
B 01531 C	64	NC
B 01535 C	47	NC
A 20635 C	43	NC
A 20621 C	43	NC
A 20628 C	37	NC
A 20628 C MS	38	NC
A 20628 C MSD	41	NC
A 20620 C	37	NC
A 01560 C	31	NC
A 20634 C	39	NC
A 01561	55	NC
A 20629 C	62	NC
A 20629 C MS	47	NC
A 20629 C MSD	46	NC
1011 C	59	NC
1028 C	62	NC
1010 C	43	NC
B 01536	27	NC
1019 C	40	NC
1027 C	48	NC
1020 C	66	NC
A 10506 C	53	NC

NC denotes Not Calculated due to coelution with Aroclor 1268
TCMX denotes tetrachloro-m-xylene
DCBP denotes decachlorobiphenyl

Table 2.10 (Cont) Results of the Surrogate Recoveries for Brown Shrimp
WA # 0-113 LCP Chemicals

Sample ID	Percent Recovery TCMX	DCBP
1062 C	51	NC
A 24169 C	45	NC
1063 C	57	NC
A 00709 C	58	NC
A 00708 C	50	NC
A 00713 C	61	NC
A 00712 C	50	NC
A 00717 C	54	NC
A 00716 C	39	NC
1059 C	53	NC
1058 C	35	NC
1200 C	41	NC
1209 C	28	NC
1314 C	44	NC
1322 C	50	NC
1330 C	50	NC
A 00618 C	54	NC
1099 C	55	NC
1346 C	46	NC
1208 C	56	NC
1338 C	45	NC
1313 C	66	NC
1321 C	62	NC
1329 C	63	NC
1337 C	65	NC
1301	41	NC
1345 C	42	NC

NC denotes Not Calculated due to coelution with Aroclor 1268
TCMX denotes tetrachloro-m-xylene
DCBP denotes decachlorobiphenyl

Table 2.11 Results of the Surrogate Recoveries for Snails
WA # 0-113 LCP Chemicals

Sample ID	Percent Recovery TCMX	DCBP
1035-01	72	NC
1035-02	56	NC
1035-03	71	NC
1035-04	60	NC
1035-05	60	NC
1035-06	54	NC
1036-01	73	NC
1036-02	62	NC
1036-03	76	NC
1036-04	69	NC
1036-05	77	NC
1036-06	66	NC
1036-07	71	NC
1036-07 MS	63	NC
1036-07 MSD	61	NC
1311-01	69	NC
1311-02	79	NC
1311-03	70	NC

NC denotes Not Calculated due to coelution with Aroclor 1268
TCMX denotes tetrachloro-m-xylene
DCBP denotes decachlorobiphenyl

Table 2.12 Results of the Surrogate Recoveries for Spartina Alterniflora
WA # 0--113 LCP Chemicals

Sample ID	Percent Recovery TCMX	Percent Recovery DCBP
A 01542	55	NC
A 01541	51	NC
A 01544	59	NC
A 01544 MS	56	NC
A 01544 MSD	57	NC

NC denotes Not Calculated due to coelution with Aroclor 1268
TCMX denotes tetrachloro-m-xylene
DCBP denotes decachlorobiphenyl

Table 2.13 Results of the Surrogate Recoveries for Diamond Back Terrapin
WA # 0-113 LCP Chemicals

Sample ID	Percent Recovery TCMX	DCBP
A 01512	63	NC
A 01512 MS	63	NC
A 01512 MSD	58	NC
B 01513	78	NC
A 01513	47	NC
B 01512	63	NC
1003	61	NC
1001	61	NC
A 00575	50	NC
A 00576	55	NC
A 00606	55	NC
A 00612	46	NC
A 00615	53	NC
A 00616	50	NC
A 00617	48	NC
A 00572	63	NC
A 00574	64	NC

NC denotes Not Calculated due to coelution with Aroclor 1268
TCMX denotes tetrachloro-m-xylene
DCBP denotes decachlorobiphenyl

Table 2.14 Results of the MS/MSD Analysis for Aroclor 1268 in Tissue
WA # 0–113 LCP Chemicals

Compound Aroclor 1268

Sample ID	Matrix	Sample Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MS % Rec	MSD Spike Added ug/kg	MSD Conc ug/kg	MSD % Rec	RPD
A 01512	Diamond Back Terrapin	U	350	290	83	349	269	77	8
A 01515	Blue Claw Crab	U	362	333	92	359	335	93	1
B 01520	Brown shrimp	U	1090	721	66	1084	720	66	0
A 20628 C	Brown shrimp	U	611	373	61	597	416	68	11
A 03123	Blue Claw Crab	U	1018	736	72	1020	694	68	6
A 01999	Blue Claw Crab	U	560	437	78	558	449	80	3
A 01521 C	Brown shrimp	U	858	731	85	854	716	83	2
A 20629 C	Brown shrimp	U	613	396	65	617	391	64	1
B 03124	Blue Claw Crab	U	299	282	94	300	306	102	8
1007	Blue Claw Crab	U	186	118	63	187	119	64	1
A 01544	Spartina Alterniflora	U	333	284	85	332	289	87	2
A 01995	Blue Claw Crab	U	343	230	67	342	243	71	5
A 01553	Blue Claw Crab	U	282	229	81	277	235	83	3
A 01992	Blue Claw Crab	U	427	347	81	426	341	80	2
A 01997	Blue Claw Crab	U	299	177	59	298	189	63	7
1005	Blue Claw Crab	U	1089	681	63	1087	722	66	6
1036–07	Snail	U	265	268	101	265	266	100	1

0113\DEL\AR\9507\PCBTISS

QC for Mercury in Tissue

QC standard TMMA #1 was used to check the accuracy of the calibration curve. The percent recoveries ranged from 94 to 107 and all nine recoveries were within the 95% confidence limits. The recoveries are listed in Table 2.15.

Samples B 01520C, B 01521C, A 20636C, A 20637C, A 01544, A 01543, B 03124, A 03121, A 01515, A 01512, A 20610-01, A 20628C, 1028C, A 00572, A 01996, A 01995, 1035-03, 1036-02, 1346C, 1208C, 1229, 1230, 1235, 1236 and 1311-02 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.16, ranged from 24 to 110. Ten values were not calculated because the concentration of mercury in the sample exceeded the concentration spiked. The relative percent differences (RPDs), also listed in Table 2.16 ranged from 0 (zero) to 31. Five values were not calculated because the concentration of mercury in the sample exceeded the concentration spiked. Limits are not available for the percent recoveries or RPDs for mercury in tissue samples.

The results of the blank spike analysis are reported in Table 2.17. The percent recoveries ranged from 99 to 106 and all ten values were within the acceptable QC limits.

Table 2.15 Results of the QC Standard Analysis for Mercury in Tissue Samples
WA# 0-113 LCP Chemical Site

Metal	Date Analyzed	Quality Control Standard	Conc Recovered ug/l	True Value ug/l	95 % Confidence Interval	% Rec
Mercury	05/22/95	TMMA #1	1.93	2.00	1.40-2.49	97
	05/23/95	TMMA #1	1.87	2.00	1.40-2.49	94
	06/07/95	TMMA #1	2.10	2.00	1.40-2.49	105
Mercury	05/25/95	TMMA #1	1.98	2.00	1.40-2.49	99
	05/26/95	TMMA #1	2.00	2.00	1.40-2.49	100
	05/26/95	TMMA #1	2.13	2.00	1.40-2.49	107
	05/31/95	TMMA #1	2.07	2.00	1.40-2.49	104
Mercury	06/01/95	TMMA #1	1.96	2.00	1.40-2.49	98
	06/02/95	TMMA #1	2.12	2.00	1.40-2.49	106

Table 2.16 Results of the MS/MSD Analysis for Mercury in Tissue Samples
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc ug/kg	Original Conc Spike ug/kg	Original Conc Dup ug/kg	Recovered Conc Spike ug/kg	Recovered Conc Dup ug/kg	% Recovery Spike	% Recovery Dup	RPD
Mercury	B01520C	351	1672	1739	1940	1983	95	94	1
Mercury	B01521C	270	1488	1488	1682	1726	95	98	3
Mercury	A20636C	399	1855	1748	2115	1949	92	89	4
Mercury	A20637C	351	2743	3367	3032	3535	98	95	3
Mercury	A01544	1824	1190	1258	2560	2642	62	65	5
Mercury	A01543	2827	938	962	3854	3627	110	83	27
Mercury	B03124	1810	730	777	2501	2347	95	69	31
Mercury	A03121	6034	1528	1590	7456	7727	93	106	13
Mercury	A01515	1972	1122	871	3159	2780	106	93	13
Mercury	A01512	1824	916	904	2743	2758	100	103	3
Mercury	A20610-01	63	597	842	660	896	100	99	1
Mercury	A20628C	98	2484	2288	2547	2357	99	99	0
Mercury	1028C	101	3284	3135	3268	3150	96	97	1
Mercury	A00572	15364	2051	2079	16554	15884	NC	NC	NC
Mercury	A01996	328	5952	4926	6458	5320	103	101	2
Mercury	A01995	115	2299	2378	2368	2438	98	98	0
Mercury	1035-03	698	2667	2286	2667	2617	74	84	13
Mercury	1036-02	37843	2874	2463	62931	57020	NC	NC	NC
Mercury	1346C	644	1474	1298	2144	1739	102	84	19
Mercury	1208C	303	1307	1333	1601	1660	99	102	2
Mercury	1229	14474	2307	1569	17509	18000	NC	NC	NC
Mercury	1230	3037	911	911	4026	3866	109	91	18
Mercury	1235	12293	1701	1797	11514	12561	NC	NC	NC
Mercury	1236	2696	513	530	2819	2831	24	25	6
Mercury	1311-02	26706	3030	2899	21061	26667	NC	NC	NC

Table 2.17 Results of the Blank Spike Analysis for Mercury in Tissue Samples
WA # 0-113 LCP Chemical Site

Metal	Spiked Concentration 1 ug/l	Spiked Concentration 2 ug/l	Recovered Conc 1 ug/l	Recovered Conc 2 ug/l	% Recovery 1	% Recovery 2	QC Limit
Mercury	2.00	2.00	2.04	2.00	102	100	75–125
Mercury	2.00	–	2.00	--	100	–	75–125
Mercury	2.00	–	1.98	--	99	–	75–125
	2.00	–	2.00	–	100	–	75–125
	2.00	–	1.98	–	99	–	75–125
	2.00	–	2.01	–	101	–	75–125
	2.00	–	2.11	–	106	–	75–125
Mercury	2.00	–	2.06	–	103	–	75–125
	2.00	–	2.06	–	103	–	75–125

QA/QC for TAL Metals in Water

QC standards QC-7x100, QC-19x100, QC-421, TMMA #1 and TMMA #2 were used to check the accuracy of the calibration curve. The percent recoveries ranged from 93 to 109 and all recoveries were within the 95% confidence limits. The recoveries are listed in Table 2.18. The 95% confidence limits for 34 values are not available.

Samples G,H 24164 and E 24164 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.19, ranged from 32 to 124. Sixty-three out of seventy-four values were within the acceptable QC limits. Two other percent recoveries were not calculated due to matrix interference. The relative percent differences (RPDs), also listed in Table 2.19 ranged from 0 (zero) to 27. Thirty-six out of thirty-seven values were within the acceptable QC limits. One value was not calculated due to matrix interference.

The results of the spike blank analysis are reported in Table 2.20. The percent recoveries ranged from 94 to 116 and all forty-six percent recoveries were within the acceptable QC limits.

Table 2.18 Results of the QC Standard Analysis for Water Samples
WA # 0-113 LCP Chemical Site

Metal	Date Analyzed	Quality Control Standard	Conc Recovered ug/l	True Value ug/l	95 % Confidence Interval	% Rec
Aluminum	05/25/95	QC-7 x100	1005	1000	N/A	101
	05/25/95	QC-421	127	121	86 - 145	105
Antimony	06/07/95	TMMA #2	108.3	100	81.65-125.67	108
Arsenic	06/05/95	TMMA #1	50.6	50	41.9-55.9	101
Barium	05/25/95	QC-7 x100	974	1000	N/A	97
	05/25/95	QC-421	295	289	237 - 341	102
Beryllium	05/25/95	QC-19 x100	1007	1000	N/A	10[illegible]
	05/25/95	QC-421	148	142	116 - 168	104
Cadmium	05/25/95	QC-19 x100	1004	1000	N/A	100
	05/25/95	QC-421	193	183	150 - 216	105
Calcium	05/25/95	QC-19 x100	1020	1000	N/A	102
Chromium	05/25/95	QC-19 x100	1018	1000	N/A	102
	05/25/95	QC-421	314	288	236 - 340	109
Cobalt	05/25/95	QC-19 x100	1027	1000	N/A	103
	05/25/95	QC-421	459	421	345 - 497	109
Copper	05/25/95	QC-19 x100	1011	1000	N/A	101
	05/25/95	QC-421	330	306	260 - 410	108
Iron	05/25/95	QC-19 x100	1032	1000	N/A	103
	05/25/95	QC-421	197	182	149 - 215	108
Lead	06/08/95	TMMA #1	51.8	50	43.4-56.3	104
Magnesium	05/25/95	QC-19 x100	1024	1000	N/A	102
Manganese	05/25/95	QC-19 x100	1010	1000	N/A	101
	05/25/95	QC-421	136	128	105 - 151	106
Mercury	06/06/95	TMMA #1	1.90	2.00	1.40-2.49	95
Nickel	05/25/95	QC-19 x100	1021	1000	N/A	102
	05/25/95	QC-421	147	142	116 - 168	104
Potassium	05/25/95	QC-7 x100	9904	10000	N/A	99
Selenium	06/06/95	TMMA #1	48.9	50	39.4-57.4	98
Silver	05/25/95	QC-7 x100	994	1000	N/A	99
	05/25/95	QC-421	42	41	34 - 49	102
Sodium	05/25/95	QC-7 x100	988	1000	N/A	99
Thallium	06/07/95	TMMA #2	49.4	50	39.9-57.97	99
Vanadium	05/25/95	QC-19 x100	974	1000	N/A	97
	05/25/95	QC-421	109	108	89 - 127	101
Zinc	05/25/95	QC-19 x100	1012	1000	N/A	101
	05/25/95	QC-421	310	290	238 - 342	107

Table 2.18 (Cont) Results of the QC Standard Analysis for Water Samples
WA # 0-113 LCP Chemical Site

Metal	Date Analyzed	Quality Control Standard	Conc Recovered ug/l	True Value ug/l	95 % Confidence Interval	% Rec
Aluminum	06/06/95	QC-7 x100	1012	1000	N/A	101
	06/06/95	QC-421	123	121	86 - 145	102
Antimony	06/08/95	TMMA #2	93.4	100	81.65-125.67	93
Arsenic	06/05/95	TMMA #1	50.6	50	41.9-55.9	101
Barium	06/06/95	QC-7 x100	976	1000	N/A	98
	06/06/95	QC-421	284	289	237 - 341	98
Beryllium	06/06/95	QC-19 x100	1020	1000	N/A	102
	06/06/95	QC-421	143	142	116 - 168	101
Cadmium	06/06/95	QC-19 x100	1015	1000	N/A	102
	06/06/95	QC-421	188	183	150 - 216	103
Calcium	06/06/95	QC-19 x100	1032	1000	N/A	103
Chromium	06/06/95	QC-19 x100	1034	1000	N/A	103
	06/06/95	QC-421	303	288	236 - 340	105
Cobalt	06/06/95	QC-19 x100	1041	1000	N/A	104
	06/06/95	QC-421	443	421	345 - 497	105
Copper	06/06/95	QC-19 x100	1017	1000	N/A	102
	06/06/95	QC-421	318	306	260 - 410	104
Iron	06/06/95	QC-19 x100	1044	1000	N/A	104
	06/06/95	QC-421	193	182	149 - 215	106
Lead	06/08/95	TMMA #1	52.8	50	43.4-56.3	106
Magnesium	06/06/95	QC-19 x100	1031	1000	N/A	103
Manganese	06/06/95	QC-19 x100	1026	1000	N/A	103
	06/06/95	QC-421	132	128	105 - 151	103
Mercury	06/06/95	TMMA #1	1.90	2.00	1.40-2.49	95
Nickel	06/06/95	QC-19 x100	1038	1000	N/A	104
	06/06/95	QC-421	146	142	116 - 168	103
Potassium	06/06/95	QC-7 x100	9714	10000	N/A	97
Selenium	06/06/95	TMMA #1	48.9	50	39.4-57.4	98
Silver	06/06/95	QC-7 x100	998	1000	N/A	100
	06/06/95	QC-421	43	41	34 - 49	105
Sodium	06/06/95	QC-7 x100	986	1000	N/A	99
Thallium	06/07/95	TMMA #2	49.4	50	39.9-57.97	99
Vanadium	06/06/95	QC-19 x100	991	1000	N/A	99
	06/06/95	QC-421	105	108	89 - 127	97
Zinc	06/06/95	QC-19 x100	1024	1000	N/A	102
	06/06/95	QC-421	300	290	238 - 342	103

Table 2.19 Results of the MS/MSD Analysis for Water Samples
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc ug/l	Original Conc Spike ug/l	Original Conc Dup. ug/l	Recovered Conc Spike ug/l	Recovered Conc Dup. ug/l	% Recovery Spike	% Recovery Dup.	RPD	RECOMMENDED LIMIT % Rec	RECOMMENDED LIMIT RPD
Aluminum	G.H24164	1720	2222	2222	5160	6109	MI	MI	MI	75–125	20
Antimony	G.H24164	U	55.6	55.6	42.8	43.3	77	78	1	75–125	20
Arsenic	G.H24164	2.8	55.6	55.6	68.3	60.0	118	103	14	75–125	20
Barium	G.H24164	33	556	556	581	596	99	101	3	75–125	20
Beryllium	G.H24164	U	222	222	198	202	89	91	2	75–125	20
Cadmium	G.H24164	1	222	222	217	225	97	101	4	75–125	20
Chromium	G.H24164	2	222	222	204	211	91	94	3	75–125	20
Cobalt	G.H24164	3	222	222	208	209	92	93	0	75–125	20
Copper	G.H24164	3	222	222	222	228	99	101	3	75–125	20
Iron	G.H24164	1556	2222	2222	3963	4221	108	120	10	75–125	20
Lead	G.H24164	10.6	55.6	55.6	43.9	36.1	60 *	46 *	27 *	75–125	20
Manganese	G.H24164	131	222	222	330	350	90	99	10	75–125	20
Mercury	G.H24164	0.4	2.00	2.00	2.50	2.50	105	105	0	75–125	20
Nickel	G.H24164	1	222	222	206	210	92	94	2	75–125	20
Selenium	G.H24164	4.4	55.6	55.6	46.1	42.8	75	69 *	8	75–125	20
Silver	G.H24164	U	222	222	211	218	95	98	3	75–125	20
Thallium	G.H24164	2.8	55.6	55.6	22.2	20.0	35 *	31 *	12	75–125	20
Vanadium	G.H24164	12	556	556	529	542	93	95	2	75–125	20
Zinc	G.H24164	U	222	222	194	198	87	89	2	75–125	20

Table 2.19 (Cont) Results of the MS/MSD Analysis for Water Samples
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc ug/l	Original Conc Spike ug/l	Original Conc Dup. ug/l	Recovered Conc Spike ug/l	Recovered Conc Dup. ug/l	% Recovery Spike	% Recovery Dup.	RPD	RECOMMENDED LIMIT % Rec	RECOMMENDED LIMIT RPD
Aluminum	E24164	U	2222	2222	1972	2051	89	92	4	75-125	20
Antimony	E24164	U	55.6	55.6	60.0	57.2	108	103	5	75-125	20
Arsenic	E24164	2.80	55.6	55.6	67.8	71.7	117	124	6	75-125	20
Barium	E24164	38.8	556	556	540	557	90	93	3	75-125	20
Beryllium	E24164	U	222	222	181	190	81	86	5	75-125	20
Cadmium	E24164	U	222	222	196	203	88	91	4	75-125	20
Chromium	E24164	U	222	222	174	189	78	85	8	75-125	20
Cobalt	E24164	3.00	222	222	181	195	80	86	8	75-125	20
Copper	E24164	2.50	222	222	205	210	91	93	2	75-125	20
Iron	E24164	47.7	2222	2222	1906	2004	84	88	5	75-125	20
Lead	E24164	8.33	55.6	55.6	39.4	40.0	56 *	57 *	2	75-125	20
Manganese	E24164	79.5	222	222	262	273	82	87	6	75-125	20
Mercury	E24164	U	2.00	2.00	2.10	2.20	105	110	5	75-125	20
Nickel	E24164	U	222	222	185	193	83	87	4	75-125	20
Selenium	E24164	1.70	55.6	55.6	37.8	40.0	65 *	69 *	6	75-125	20
Silver	E24164	4.20	222	222	200	205	88	90	3	75-125	20
Thallium	E24164	2.8	55.6	55.6	22.8	25.6	36 *	41 *	13	75-125	20
Vanadium	E24164	10.0	556	556	478	499	84	88	4	75-125	20
Zinc	E24164	U	222	222	174	180	78	81	3	75-125	20

Table 2.20 Results of the Blank Spike Analysis for Water Samples
WA # 0-113 LCP Chemical Site

METAL	Spiked Conc ug/l	RECOVERED CONC ug/l	% RECOVERY	RECOMMENDED LIMIT
Aluminum	2222	2170	98	75-125
Antimony	55.6	52.2	94	75-125
Arsenic	55.6	58.3	105	75-125
Barium	556	542	98	75-125
Beryllium	222	221	99	75-125
Cadmium	222	213	96	75-125
Calcium	2222	2198	99	75-125
Chromium	222	221	99	75-125
Cobalt	222	222	100	75-125
Copper	222	227	102	75-125
Iron	2222	2255	101	75-125
Lead	55.6	58.2	105	75-125
Magnesium	2222	2207	99	75-125
Manganese	222	220	99	75-125
Mercury	2.00	2.00	100	75-125
Nickel	222	223	100	75-125
Potassium	2222	2568	116	75-125
Selenium	55.6	57.7	104	75-125
Silver	222	212	95	75-125
Sodium	2222	2193	99	75-125
Thallium	55.6	55.7	100	75-125
Vanadium	556	548	99	75-125
Zinc	222	217	98	75-125

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Table 2.20 (Cont) Results of the Blank Spike Analysis for Water Samples
WA # 0-113 LCP Chemical Site

METAL	Spiked Conc ug/l	RECOVERED CONC ug/l	% RECOVERY	RECOMMENDED LIMIT
Aluminum	2222	2182	98	75-125
Antimony	55.6	57.4	103	75-125
Arsenic	55.6	53.2	96	75-125
Barium	556	539	97	75-125
Beryllium	222	221	99	75-125
Cadmium	222	215	97	75-125
Calcium	2222	2187	98	75-125
Chromium	222	220	99	75-125
Cobalt	222	219	99	75-125
Copper	222	226	102	75-125
Iron	2222	2230	100	75-125
Lead	55.6	57.9	104	75-125
Magnesium	2222	2216	100	75-125
Manganese	222	219	99	75-125
Mercury	2.00	2.00	100	75-125
Nickel	222	224	101	75-125
Potassium	2222	2314	104	75-125
Selenium	55.6	56.6	102	75-125
Silver	222	212	95	75-125
Sodium	2222	2151	97	75-125
Thallium	55.6	48.1	87	75-125
Vanadium	556	545	98	75-125
Zinc	222	219	99	75-125

QA/QC for TAL Metals in Sediment

QC standards QC-7x100, QC-19x100, QC-421, TMMA #1 and TMMA #2 were used to check the accuracy of the calibration curve. The percent recoveries ranged from 97 to 120 and thirty-nine out of forty recoveries were within the 95% confidence limits. The recoveries are listed in Table 2.21. The 95% confidence limits for 38 values are not available.

Samples A 01510, J 24164, 1050 A and SD3 dup were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.22, ranged from 32 to 137. Six other percent recoveries were not calculated due to matrix interference and six values were not calculated because the concentration of analyte spiked was less than that contained in the sample. The relative percent differences (RPDs), also listed in Table 2.22 ranged from 0 (zero) to 49. Three values were not calculated due to matrix interference and three others were not calculated because the percent recoveries were not calculated. QC limits are not available for the percent recoveries or the relative percent differences of metals in sediments.

The results of the spike blank analysis are reported in Table 2.23. The percent recoveries ranged from 86 to 116. QC limits are not available for this analysis.

Table 2.21 Results of the QC Standard Analysis for Sediment Samples
WA # 0-113 LCP Chemical Site

Metal	Date Analyzed	Quality Control Standard	Conc Recovered ug/l	True Value ug/l	95 % Confidence Interval	% Rec
Aluminum	05/26/95	QC-7 x100	1020	1000	N/A	102
	05/26/95	QC-421	145	121	86 - 145	120
Antimony	05/26/95	QC-19 x100	996	1000	N/A	100
Arsenic	05/24/95	TMMA #1	53	50	41.9-55.9	106
	06/09/95	TMMA #1	53	50	41.9-55.9	106
Barium	05/26/95	QC-7 x100	995	1000	N/A	100
	05/26/95	QC-421	299	289	237 - 341	103
Beryllium	05/26/95	QC-19 x100	1041	1000	N/A	104
	05/26/95	QC-421	152	142	116 - 168	107
Cadmium	05/26/95	QC-19 x100	1043	1000	N/A	104
	05/26/95	QC-421	199	183	150 - 216	109
Calcium	05/26/95	QC-19 x100	1055	1000	N/A	106
Chromium	05/26/95	QC-19 x100	1063	1000	N/A	106
	05/26/95	QC-421	322	288	236 - 340	112
Cobalt	05/26/95	QC-19 x100	1078	1000	N/A	108
	05/26/95	QC-421	483	421	345 - 497	115
Copper	05/26/95	QC-19 x100	1039	1000	N/A	104
	05/26/95	QC-421	336	306	260 - 410	110
Iron	05/26/95	QC-19 x100	1084	1000	N/A	108
	05/26/95	QC-421	209	182	149 - 215	115
Lead	05/26/95	QC-19 x100	1053	1000	N/A	105
	05/26/95	QC-421	111	94	77 - 111	118
Magnesium	05/26/95	QC-19 x100	1014	1000	N/A	101
Manganese	05/26/95	QC-19 x100	1053	1000	N/A	105
	05/26/95	QC-421	141	128	105 - 151	110
Mercury	05/23/95	TMMA #1	1.87	2.00	1.40-2.49	94
	06/09/95	TMMA #1	2.10	2.00	1.40-2.49	105
Nickel	05/26/95	QC-19 x100	1079	1000	N/A	108
	05/26/95	QC-421	161	142	116 - 168	113
Potassium	05/26/95	QC-7 x100	9874	10000	N/A	99
Selenium	05/24/95	TMMA #1	50	50	39.4-57.4	100
	06/23/95	TMMA #1	51	50	39.4-57.4	102
Silver	05/26/95	QC-7 x100	1022	1000	N/A	102
	05/26/95	QC-421	44	41	34 - 49	107
Sodium	05/26/95	QC-7 x100	1014	1000	N/A	101
Thallium	05/24/95	TMMA #2	50	50	39.9-57.97	100
	06/09/95	TMMA #2	55	50	39.9-57.97	110
Vanadium	05/26/95	QC-19 x100	1029	1000	N/A	103
	05/26/95	QC-421	111	108	89 - 127	103
Zinc	05/26/95	QC-19 x100	1056	1000	N/A	106
	05/26/95	QC-421	324	290	238 - 342	112

Table 2.21 (Cont) Results of the QC Standard Analysis for Sediment Samples
WA # 0-113 LCP Chemical Site

Metal	Date Analyzed	Quality Control Standard	Conc Recovered ug/l	True Value ug/l	95 % Confidence Interval	% Rec
Aluminum	06/02/95	QC-7 x100	1034	1000	N/A	103
	06/02/95	QC-421	144	121	86 - 145	119
Antimony	06/02/95	QC-19 x100	1016	1000	N/A	102
Arsenic	06/09/95	TMMA #1	53	50	41.9-55.9	106
Barium	06/02/95	QC-7 x100	1001	1000	N/A	100
	06/02/95	QC-421	301	289	237 - 341	104
Beryllium	06/02/95	QC-19 x100	1037	1000	N/A	104
	06/02/95	QC-421	152	142	116 - 168	107
Cadmium	06/02/95	QC-19 x100	1046	1000	N/A	105
	06/02/95	QC-421	200	183	150 - 216	109
Calcium	06/02/95	QC-19 x100	1063	1000	N/A	106
Chromium	06/02/95	QC-19 x100	1069	1000	N/A	107
	06/02/95	QC-421	329	288	236 - 340	114
Cobalt	06/02/95	QC-19 x100	1060	1000	N/A	106
	06/02/95	QC-421	484	421	345 - 497	115
Copper	06/02/95	QC-19 x100	1044	1000	N/A	104
	06/02/95	QC-421	341	306	260 - 410	111
Iron	06/02/95	QC-19 x100	1080	1000	N/A	108
	06/02/95	QC-421	210	182	149 - 215	115
Lead	06/02/95	QC-19 x100	1065	1000	N/A	107
	06/02/95	QC-421	114 *	94	77 - 111	121
Magnesium	06/02/95	QC-19 x100	967	1000	N/A	97
Manganese	06/02/95	QC-19 x100	1053	1000	N/A	105
	06/02/95	QC-421	142	128	105 - 151	111
Mercury	06/07/95	TMMA #1	2.10	2.00	1.40-2.49	105
Nickel	06/02/95	QC-19 x100	1083	1000	N/A	108
	06/02/95	QC-421	156	142	116 - 168	110
Potassium	06/02/95	QC-7 x100	10050	10000	N/A	101
Selenium	06/12/95	TMMA #1	51	50	39.4-57.4	102
Silver	06/02/95	QC-7 x100	1028	1000	N/A	103
	06/02/95	QC-421	47	41	34 - 49	115
Sodium	06/02/95	QC-7 x100	1019	1000	N/A	102
Thallium	06/09/95	TMMA #2	55	50	39.9-57.97	110
Vanadium	06/02/95	QC-19 x100	1030	1000	N/A	103
	06/02/95	QC-421	114	108	89 - 127	106
Zinc	06/02/95	QC-19 x100	1058	1000	N/A	106
	06/02/95	QC-421	325	290	238 - 342	112

Table 2.22 Results of the MS/MSD Analysis for Sediment Samples
WA # 0–113 LCP Chemical Site

Metal	Sample ID	Sample Conc mg/kg	Original Conc Spike mg/kg	Original Conc Dup. mg/kg	Recovered Conc Spike mg/kg	Recovered Conc Dup mg/kg	% Recovery Spike	% Recovery Dup.	RPD
Antimony	A01510	U	77.9	71.3	1.84	5.68	MI	MI	MI
Antimony	J24164	U	69.7	70.8	4.99	12.5	MI	MI	MI
Arsenic	A01510	10.3	11.8	10.8	16.8	15.4	55	47	16
Arsenic	J24164	9.35	6.42	6.00	13.1	12	58	44	28
Barium	A01510	36.3	156	143	185	167	95	92	4
Barium	J24164	28.8	139	142	165	166	98	97	1
Beryllium	A01510	1.47	77.9	71.3	76.4	68.6	96	94	2
Beryllium	J24164	1.51	69.7	70.8	70.2	71.8	99	99	0
Cadmium	A01510	0.098	77.9	71.3	71.2	64.7	91	91	1
Cadmium	J24164	0.11	69.7	70.8	66.2	67.8	95	96	1
Chromium	A01510	78.4	77.9	71.3	155	147	98	96	2
Chromium	J24164	83.9	69.7	70.8	153	151	99	95	5
Cobalt	A01510	9.98	77.9	71.3	83.3	76.2	94	93	1
Cobalt	J24164	7.81	69.7	70.8	74.6	75.8	96	96	0
Copper	A01510	33.0	77.9	71.3	106	99.3	94	93	1
Copper	J24164	12.5	69.7	70.8	79.8	80.9	97	97	0
Lead	A01510	49.8	77.9	71.3	119	114	89	90	1
Lead	J24164	30.0	69.7	70.8	92.3	95.7	89	93	4
Manganese	A01510	743	77.9	71.3	786	782	55	55	1
Manganese	J24164	616	69.7	70.8	653	651	53	49	7
Mercury	A01510	90.0	0.801	0.696	102	103	NC	NC	NC
Mercury	J24164	2.74	0.61	0.47	3.24	3.41	NC	NC	NC
Nickel	A01510	15.1	77.9	71.3	90.6	82.6	97	95	2
Nickel	J24164	12.3	69.7	70.8	80.7	81.0	98	97	1
Selenium	A01510	0.772	11.8	10.8	6.61	6.07	49	49	1
Selenium	J24164	0.49	6.42	6.00	3.86	2.4	52	32	49
Silver	A01510	0.23	77.9	71.3	67.2	61.7	86	86	0
Silver	J24164	0.15	69.7	70.8	64.7	66.3	93	93	1
Thallium	A01510	0.257	11.8	10.8	4.72	4.118	38	36	6
Thallium	J24164	0.12	6.42	6.00	2.18	2.4	32	38	17
Vanadium	A01510	66.9	156	143	210	196	92	91	1
Vanadium	J24164	62.5	139	142	196	198	96	96	0
Zinc	A01510	98.7	77.9	71.3	177	167	100	96	5
Zinc	J24164	67.2	69.7	70.8	137	136	100	97	3

Table 2.22 (Cont) Results of the MS/MSD Analysis for Sediment Samples
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc mg/kg	Original Conc Sp. mg/kg	Original Conc Dup. mg/kg	Recovered Conc Spike mg/kg	Recovered Conc Dup mg/kg	% Recovery Spike	% Recovery Dup.	RPD
Antimony	1050A	U	74.1	64.3	18.2	17.10	MI	MI	MI
Arsenic	1050A	6.92	6.95	5.39	11.9	10.1	72	59	19
Barium	1050A	34.6	148	129	181	157	99	95	4
Beryllium	1050A	1.09	74.1	64.3	74.2	64.7	99	99	0
Cadmium	1050A	0.548	74.1	64.3	71.9	62.1	96	96	1
Chromium	1050A	82.2	74.1	64.3	160	146	105	99	6
Cobalt	1050A	6.52	74.1	64.3	80.0	69.4	99	98	1
Copper	1050A	24.2	74.1	64.3	96.6	85.5	98	95	3
Lead	1050A	134	74.1	64.3	209	198	101	99	2
Lead	SD3 DUP	134	50.0	49.0	184	201	100	137	31
Manganese	1050A	279	74.1	64.3	373	332	127	82	43
Mercury	SD3 DUP	7.84	0.392	0.400	7.65	8.20	NC	NC	NC
Nickel	1050A	11.2	74.1	64.3	87.4	75.2	103	99	3
Selenium	1050A	0.512	6.95	5.39	4.17	2.80	53	42	21
Silver	1050A	0.412	74.1	64.3	69.7	60.8	94	94	0
Thallium	1050A	0.128	6.95	5.39	2.64	1.94	36	34	7
Vanadium	1050A	50.8	148	129	198	175	99	97	3
Zinc	1050A	113	74.1	64.3	185	169	97	87	11

Table 2.23 Results of the Blank Spike Analysis for Sediment Samples
WA # 0-113 LCP Chemical Site

METAL	Spiked Conc mg/kg	Sand Blk Conc mg/kg	RECOVERED CONC mg/kg	% RECOVERY
Aluminum	396	10.1	444	110
Antimony	49.5	U	43.2	87
Arsenic	4.95	U	5.45	110
Barium	99.0	U	98.7	100
Beryllium	49.5	U	52.3	106
Cadmium	49.5	U	51.5	104
Calcium	396	8.7	428	106
Chromium	49.5	U	52.9	107
Cobalt	49.5	U	53.0	107
Copper	49.5	U	51.4	104
Iron	396	107	539	109
Lead	49.5	U	53.4	108
Magnesium	396	1.8	411	103
Manganese	49.5	U	52.2	105
Mercury	0.400	U	0.400	100
Nickel	49.5	U	53.2	107
Potassium	396	U	409	103
Selenium	4.95	U	4.85	98
Silver	49.5	U	49.9	101
Sodium	396	4.3	402	100
Thallium	4.95	U	4.26	86
Vanadium	99.0	U	103	104
Zinc	49.5	2.8	55.3	106

Table 2.23 (Cont) Results of the Blank Spike Analysis for Sediment Samples
WA # 0-113 LCP Chemical Site

METAL	Spiked Conc mg/kg	Sand Blk Conc mg/kg	RECOVERED CONC mg/kg	% RECOVERY
Aluminum	392	21.5	432	105
Antimony	49.0	U	45.5	93
Arsenic	4.85	U	5.53	114
Barium	98.0	U	96.3	98
Beryllium	49.0	U	50.5	103
Cadmium	49.0	U	49.7	101
Calcium	392	11.0	417	104
Chromium	49.0	U	51.1	104
Cobalt	49.0	U	51.1	104
Copper	49.0	U	49.7	101
Iron	392	79.8	507	109
Lead	49.0	U	51.9	106
Magnesium	392	7.9	405	101
Manganese	49.0	U	50.5	103
Mercury	0.400	U	0.4	100
Nickel	49.0	U	51.2	104
Potassium	392	U	392	100
Selenium	4.85	U	5.05	104
Silver	49.0	U	48.6	99
Sodium	392	15.6	408	100
Thallium	4.85	U	4.85	100
Vanadium	98.0	U	99.9	102
Zinc	49.0	2.0	53.3	105

Table 2.23 (Cont) Results of the Blank Spike Analyses for Sediment Samples
WA # 0-113 LCP Chemical Site

METAL	Spiked Conc mg/kg	Sand Blk Conc mg/kg	RECOVERED CONC mg/kg	% RECOVERY
Aluminum	392	11.2	413	102
Antimony	49.0	U	45.8	93
Arsenic	4.81	U	5.39	112
Barium	98.0	U	96.2	98
Beryllium	49.0	U	50.0	102
Cadmium	49.0	U	50.1	102
Calcium	392	9.2	415	103
Chromium	49.0	U	51.2	104
Cobalt	49.0	U	51.5	105
Copper	49.0	U	50.1	102
Iron	392	43.5	500	116
Lead	49.0	2.0	52.8	104
Magnesium	392	6.4	404	101
Manganese	49.0	U	50.6	103
Mercury	0.400	*	0.400	100
Nickel	49.0	U	52.4	107
Potassium	392	7.9	375	94
Selenium	4.81	U	4.81	100
Silver	49.0	U	48.8	100
Sodium	392	6.6	388	97
Thallium	4.81	U	4.62	96
Vanadium	98.0	U	99.9	102
Zinc	49.0	1.6	53.0	105

* a sand blank was not run for this metal.

QA/QC for Organic Mercury

Samples A 01553 and A 2061102 were chosen for duplicate analyses. The relative percent difference listed in Table 2.24, were 14 and 17.

Samples DORM-2 and DOLT-2 were the standard reference samples. The percent recoveries, listed in Table 2.25, were 80 and 89.

Samples A 00572 and A 03121 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses for methyl mercury. The percent recoveries, listed in Table 2.26, were 83 and 99.

Table 2.24 Results of the Duplicate Analysis
for Methyl Mercury
WA # 0-113 LCP Chemical Site

Sample ID	First Analysis mg/kg	Second Analysis mg/kg	RPD
A 01553	0.221	0.254	14
A 2061102	0.325	0.273	17

Table 2.25 Results of the Analysis
of the Standard Reference Samples
WA # 0–113 LCP Chemical Site

Designation	Certified Value mg/kg	Analyzed Value mg/kg	% Recovery
DORM–2	4.47	3.58	80
DOLT–2	0.693	0.618	89

Table 2.26 Results of the Matrix Spike Analysis for Methyl Mercury
(based on dry weight)
WA # 0-113 LCP Chemical Site

Sample ID	Sample Conc mg/kg	Spiked Conc mg/kg	Recovered Conc mg/kg	% Recovery
A 00572	5.89	2.37	7.84	83
A 03121	4.93	2.02	6.94	99

QA/QC for Oil and Grease and Total Petroleum Hydrocarbons

Samples AB 01510 and JK 24164 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.27, ranged from 99 to 116. The relative percent differences (RPDs), also listed in Table 2.27 ranged from 0 (zero) to 4. QC limits are not available for the percent recoveries or the relative percent differences of oil and grease or total petroleum hydrocarbons in sediments.

Table 2.27 Results of the MS/MSD Analysis for Oil & Grease & Total Petroleum Hydrocarbons WA #0-113 LCP Chemical Based on Dry Weight

Sample ID AB 01510

Compound	Sample Conc (mg/kg)	MS Spike Added (mg/kg)	MS Conc (mg/kg)	MS % Rec	MSD Spike Added (mg/kg)	MSD Conc (mg/kg)	MSD % Rec	RPD
Oil & Grease	226	10473	12400	116	10473	12233	115	1
Petroleum Hydrocarbons	U	10473	11358	108	10473	11352	108	0

Sample ID J K 24164

Compound	Sample Conc (mg/kg)	MS Spike Added (mg/kg)	MS Conc (mg/kg)	MS % Rec	MSD Spike Added (mg/kg)	MSD Conc (mg/kg)	MSD % Rec	RPD
Oil & Grease	U	37067	38847	105	37067	38263	103	2
Petroleum Hydrocarbons	U	37067	38183	103	37067	36618	99	4

REAC, E[illegible]on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI[illegible] OF CUSTODY RECORD

Project Name LCP
Project Number 03347040001011301
REW Contact Rich Henry Phone (908) 321-4200

No: 00110

SHEET NO. 1 OF 1

052395

Sample Identification / Analyses Requested

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCB			
374	A,B24165	LCP 10-11	W	5/21/95	2	32oz/4°C	X			
375	A-D24167	LCP 19-20			4		X			
376	A,B24168	LCP 35-36			2		X			
377	A,B24166	LCP 17-18			2		X			
378	A,B24163	LCP 45			2		X			
379	A-D24164	LCP 46			~~PAD~~ 4		X			
380	A,B24162	LCP 44			2		X			
374oc										

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
Samples 24167, 24168, and 24166 are from the "hot zone".

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analysis	Richard Henry	5/22/95	B Lewis	5/23/95	1010	7/Analyses	B Lewis	5/23/95	[illegible]	5-23-95	13:10

8/94

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name ~~[illegible]~~ LCP
Project Number 03347040001013801
RFW Contact Rich Henry Phone (908) 321-4200

No: 00112

SHEET NO. 1 OF 1

Sample Identification							Analyses Requested				
REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCB	TAL Metals	Pet HC	PAN	[illegible]
311	A,B 24161	LCP 43	W	5/21/95	2	32oz / 4°C	X				
312	D 24163	LCP 45	W	5/21/95	1	1L poly / HNO3 4°C		X			
313	G 24161	LCP 43			1			X			
314	C 24162	LCP 44			1			X			
315	G,H 24164	LCP 46			2			X			
316	D 24166	LCP 17-18			1			X			
317	C 24168	LCP 35-36			1			X			
318	D 24165	LCP 10-11			1			X			
319	E,F 24167	LCP 19-20			2			X			
390	J,K 24164	LCP 46	SD		2	4oz / 4°C	X	X	X	X	
391	D 24161	LCP 43			1		X	X	X	X	
392	F 24162	LCP 44			1		X	X	X	X	
393	G 24163	LCP 45			1		X	X	X	X	
394	L 24164	LCP 46	SD	5/21/95	1	32 oz / 4°C					X

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
Samples 24166, 24168 & 24167 collected from "Hot Zone"

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FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All / analysis	Richard Henry	5/22/95	B Lewa	05/22/95	1010	10 / Analysis	B Lewa	5/23/95	[illegible]	5/23/95	11:30
						5 / Analysis	B Lewa	5/23/95	[illegible]	5-23-95	13:10
						1 / Analysis	B Lewa	5/23/95	[illegible]	5/23/95	13:40

REAC, Ed[illegible]on, NJ
(908) 321-4200
EPA Contract 68-C4 0022

CHAIN OF CUSTODY RECORD

Project Name LCP
Project Number 03347040001-01-1307
RFW Contact R. A. Henry Phone (908) 321-4200

No: 00118

SHEET NO. 1 OF 2

05 25 95

Sample Identification | Analyses Requested

Pest, HC, TAL Metals, PCB

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PAH	TOC	Grain Size	TAL Filtered
643	1050A	LCP 47	SD	5/23/95	1	4oz/4°C	X			
644	1051A	LCP 48					X			
645	1052A	LCP 49					X			
646	1053A	LCP 50					X			
647	1055A	LCP 51					X			
*648	1050B	LCP 47						X		
*649	1051B	LCP 48						X		
*650	1052B	LCP 49						X		
*651	1053B	LCP 50						X		
*652	1055B	LCP 51						X		
653	1050C	LCP 47				32oz/NA			X	
654	1051C	LCP 48							X	
655	1052C	LCP 49							X	
656	1053C	LCP 50							X	
657	1055C	LCP 51							X	
658	C24161	LCP 43	W	5/21/95	1	1L poly/4°C, HNO_3				X
659	D24162	LCP 44								X
660	C24163	LCP 45			1					X
661	EF24164	LCP 46			2					X
662	C24165	LCP 10-11			1					X

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions:
Water samples on this COC have been filtered in the field
* Note: Did not receive REAC #s 648-652. Samples were sent to subcontractor (BE)

Samples C24165 have been collected from Hot Zone

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	Rick Henry	5/24/95	B Lewa	5/25/95	1015	All/Analysis	B Lewa	5/25/95	[illegible]	5/25/95	1345
						All/Analysis	B Lewa	5/25/95	[illegible]	5/25/95	2:15
								5/25/95	[illegible]	5/25/95	1515

8/94

00121

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name LCP
Project Number 03347040001011301
REW Contact Rich Henry Phone (908) 321-4200

No: 00119

SHEET NO 2 OF 2

052595

Sample Identification **Analyses Requested**

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	TAL Metals	TAL Metals	Pest NC	PAH
663	C24166	LCP 17-18	W	5/21/95	1	1 poly/4°C, HNO_3	X			
~~664~~	~~G24167~~	~~LCP 19-20~~								
~~665~~	~~H24~~									
664 666	G,H24167	LCP 19-20			2	1 poly/4°, HNO_3	X			
665 667	D24168	LCP 35-36			1		X			
666 668	A20613	Reference	W	5/19/95	1	1 poly/4°, HNO_3	X			
667 669	A20612	Reference			1		X			
661 670	K24160	LCP 10-11	SD	5/20	1	8oz 4°C	X	X	X	X

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions: Water samples on this COC have been filtered in the field *

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Samples G,H24167, C24166 and D24168 have been collected from "Hot Zone".

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analysis	Rich Henry	5/24/95	B Lewan	5/25/95	1015	All Analysis	B Lewan	5/25/95	[illegible]	5/25/95	2:15
						TV Analysis	B Lewan	5/25/95	[illegible]	[illegible]	1515

001[illegible]

REAC, Edi[illegible] NJ
(908) 321-42[illegible]
EPA Contract 68-C4-0022

CHAI[illegible] CUSTODY RECORD

Project Name [illegible]
Project Number: 03347040001 01301
RFW Contact Rick [illegible] Phone: (908) 321-4200

No: 00120

SHEET NO. 1 OF 1

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	TOC			
5032	1050B	LCP 47	SD	5/23/95	1	4oz/4°C	X			
5033	1051B	LCP 48					X			
5034	1052B	LCP 49					X			
5035	1053B	LCP 50					X			
5036	1055B	LCP 51					X			

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/analysis	Rick [illegible]	5/24/95									

8/94

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: LCP Chemical
Project Number: 03347-040-001-0113-01
RFW Contact: Rich Henry Phone: (908) 321-4242

No: 00142

SHEET NO. 1 OF 1

DS2095

Sample Identification — **Analyses Requested**: TAL Metals, PCB, PAH

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Pet HC			
205	J01508	Reference	SD	5/17/95	1	8oz glass/4°C	X			
206	AB01510	SED 35	↓	5/17/95	2	↓	X			
207	K01546	SED 19-20	↓	5/18/95	1	↓	X			
208	K01540	SED 36	↓	5/18/95	1	↓	X			
209	J01545	SED 17-18	↓	5/19/95	1	↓	X			

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/analysis	[illegible]	5/19/95	B. Lang	05/20/95	0845	5/ Analysis	B. Lang	5/22/95	Colleen [illegible]	5/23/95	9:45
			[illegible]	5/22/95	11:45						

001224

REAC, E[illegible]on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHA[illegible] OF CUSTODY RECORD

Project Name LCP CHEMICAL
Project Number [illegible]
REW Contact [illegible] Phone (908) 321-4242

No: 00573

SHEET NO. 1 OF 4

05 31 95

Sample Identification / Analyses Requested

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	INORG Hg	ORG Hg	PCB	% Solid % Lipid
021	1062C	[illegible]	X_1	[illegible]	3	2 OZ JARS/-10°C				
		1065,10[illegible]								
		10[illegible]4								
022	A24167C	A24167,A200[illegible]								
023	A00708C	A00708,A00[illegible]								
024	A00712C	A00712,A00[illegible]								
025	A00716C	A00716,1056								
026	1058C	1058,1060								
027	1063C	1063 1065,1067	X_2							
		1061,10[illegible],10[illegible]								
		10[illegible]								
028	A00618C	A00618,A00708								
029	A00707C	A00707,A00711								
030	A00713C	A00713,A00715								
031	A00717C	A00717, 1057								
032	1059C	1059, 1061								
033	1200C	1200,1201,1203	X_1							
		1206,1207								
034	1209C	1209,1211,1214								
		1216,1218								

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions:
X_1 = EDIBLE SHRIMP ~~(TURTLE-RIVER)~~ 9.X.
X_2 = INEDIBLE SHRIMP

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY # 00121, 00116, 00126

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[signature]	5/31/95	B. Lewa	5/31/95	0750	14/Analysis	B Lewa	5/31/95	[signature]	5/31/95	1:41pm

8/94

REAC, Ec   n, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIl F CUSTODY RECORD

Project Name LCP CHEMICAL
Project Number C3347-040-001-0113-01
RFW Contact RICH HENRY Phone (908) 321-4242

No: 00574

SHEET NO. 2 OF 4

(9) 1S 3195

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	INORG Hg	ORG Hg	PCB	% Solid	% Lipid
916	1314C	1314, 1316	X1	5/23/95	3	2OZ JARS/-10°C					
		1318, 1320									
917	1322C	1322, 1324, 1326									
		1328									
918	1330C	1330, 1332,									
		1334, 1336									
919	1333C	1338, 1340,									
		1342, 1344									
990	1346C	1346, 1348, 1350									
		1352, 1076,									
		1353, 1355									
991	1099C	1099, 1202, 1204	X2								
		1205, 1078									
992	1208C	1208, 1210, 1213									
		1215, 1217									
993	1313C	1313, 1315, 1317									
		1319									
994	1321C	1321, 1323									
		1325, 1327									

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions:
X1 = EDIBLE SHRIMP
X2 = INEDIBLE SHRIMP

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF C0126
CUSTODY # 00143

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[signature]	5/31/95	B Lane	5/31/95	0930	9/Analyses	B Lane	5/31/95	[signature]	5/31/95	1:43pm

001?6

REAC, E[illegible]n, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI[illegible] F CUSTODY RECORD

Project Name [illegible]
Project Number [illegible]
REW Contact [illegible] Phone (908) 32[illegible]-4242

No: 00575

SHEET NO. 3 OF 4

Sample Identification / Analyses Requested

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	INORG Hg	ORG Hg	PCB	% Solid % Lipid
005	1327C	1327, 13[illegible]	X2	[illegible]	3	2OZ JARS / -10°C				
		133[illegible], 13[illegible]								
006	1337C	1337, 13[illegible]								
		1341, 1343								
007	1345C	1345, 1347, 1349								
		1351, 1022,								
		1354, 1356								
008	1231		X3							
009	1233									
010	1235									
011	1237									
012	1301									
013	1303									
014	1305									
015	1232		X4							
016	1234									
017	1236									
018	1238									
019	1302									
020	1304									

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions:
X_2 = INEDIBLE SHRIMP
X_3 = EDIBLE BLUE CRAB
X_4 = INEDIBLE BLUE CRAB

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY # 00143, 00144, 00145, 00135

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[signature]	5/31/95	B. Levan	5/31/95	0950	16/Analysis	B. Levan	5/31/95	[signature]	5/31/95	1245

8/94

001[illegible]

REAC, E[illegible]n, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI[illegible] F CUSTODY RECORD

Project Name [illegible]
Project Number [illegible]
RFW Contact [illegible] Phone (908) 321-4242

No: 00576

SHEET NO. 4 OF 4

[illegible] 3/[illegible]

Sample Identification

Analyses Requested

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	INORG Hg	ORG Hg	PCB	% lipid	% Moist
995	1306	[illegible]	X4	5/23/95	3	2oz JARS / -10°C					
996	1227		X3								
997	1229		X3								
998	1228		X4								
999	1230		X4								
001	1284		X3								
002	1286		X3								
003	1288		X3								
004	1292		X3								

all

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:
X3 = EDIBLE BLUE CRAB
X4 = INEDIBLE BLUE CRAB

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY # 00135, 00132

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[illegible]	5/31/95	[illegible]	5/31/95	0950	All Analysis	[illegible]	5/31/95	[illegible]	5/31/95	1:42pm

001328

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name 601
Project Number 03347040001013??
REW Contact Mark Huston Phone (908) 321-4200

No: 00590

SHEET NO. 1 OF 1

052595

Sample Identification **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	★			
669	SD3DUP	Str. 3	SD	5/16/95	1	XRF cup/None	"			
670	SD 4	" 4	SD	"	1	"	"			
671	SD 5	" 5	SD	"	1	"	"			
672	WET 5	5	SD	"	1	"	"			
673	WET 19	" 19	SD	"	1	"	"			
674	SED 24	" 24	SD	5/18/95	1	"	"			
675	SED 25	" 25	SD	"	1	"	"			
676	SED 33	" 33	SD	"	1	"	"			
677	SED 44	" 44	SD	5/19/95	1	"	"			
★678	OUTFALL	[illegible] outfall	SD	"	1	"	"			

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions: ★ Analyze for Hg and Pb.

★ There were (2) outfall sample containers. (1) was a duplicate.

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
10/Analyses	Mark Sieling	5/22	B Lewis	5/25/95	11:15	10/Analysis	B Lewis	5/25/95	Colleen Egan	5/25/95	2:15

0017

8/94

Roy F. W[illegible]on, Inc.
REAC, Ed[illegible]on, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

No: 7443

Project Name: LCP
Project Number: 03347-040-001-0113-01
RFW Contact: Rich Henry Phone: (908) 321-4200

SHEET NO. 1 OF 1

7443 MK 7/12/95

SAMPLE IDENTIFICATION

ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	Toxicity	TOC		
5001	A-H01508	Reference	SD	5/17/95	8	32oz glass/4°C	X			
5002	I01508	Reference	SD	5/17/95	1	4oz glass/4°C		X		
5003	C01510	SED 35	SD	5/18/95	1	4oz glass/4°C		X		
5004	A01546	SED 19-20	SD	5/18/95	1	4oz glass/4°C		X		
5005	B-I01546	SED 19-20	SD	5/18/95	8	32oz glass/4°C	X			
5006	A 01540	SED 36	SD	5/18/95	1	4oz glass/4°C		X		
5007	B-I01540	SED 36	SD	5/18/95	8	32oz glass/4°C	X			
5008	A-H01545	SED 17-18	SD	5/19/95	8	32oz glass/4°C	X			
5009	I 01545	SED 17-18	SD	5/19/95	1	4oz glass/4°C		X		

0013

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analysis	[signature]	5/19/95									

Roy F. W[illegible]on, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY CORD/LAB WORK REQUEST

No: 82[illegible]

Project Name: LCP
Project Number: 03347040001011307
RFW Contact: Rick Henry Phone: (908) 321-4200

SHEET NO. 1 OF 1

8272
7/12/95

SAMPLE IDENTIFICATION | ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	Toxicity	TOC		
5018	A-H24160	LCP 10-11	SD	5/20/95	8	32oz / 4°C	X			
5019	I 24160	LCP 10-11	SD	5/20/95	1	4oz / 4°C		X		
5020	E 24161	LCP 43	SD	5/21/95	1			X		
5021	E 24162	LCP 44	SD					X		
5022	I 24164	LCP 46	SD					X		
[illegible]23	E 24163	LCP 45	SD					X		

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
6/analysis	Michael [illegible]	5/23/95									

Roy F. [illegible]eston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY [illegible]CORD/LAB WORK REQUEST

Project Name [illegible]
Project Number [illegible]
REW Contact [illegible] Phone (7[illegible]) 3[illegible]-4242

No: 95[illegible]0

052295

SHEET NO. 1 OF 1

SAMPLE IDENTIFICATION

ANALYSES REQUESTED

REAC #	Sample No.*	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	INORG HG			
262	B01520C	[illegible]	X1	[illegible]	1	[illegible]				
263	B01521C	B01521, B0152[illegible]	X2							
264	B01526C	B01526, B0152[illegible]	X1							
265	B01527C	B01527, B0152[illegible]	X2							
266	B01530C	B01530, B01532	X1							
267	B01531C	B01531, B01533	X2							
268	B01534C	B01534, B01535	X1							
269	B0153[illegible]C	B0153[illegible], B0153[illegible]	X2							
270	B01536		X1							
271	B01537		X2							
~~272~~	* SAMPLES WITH A "C" ARE COMPOSITE SAMPLES OF THOSE LISTED IN SAMPLING LOCATION									

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:
X_1 = SHRIMP, EDIBLE TISSUE
X_2 = SHRIMP, INEDIBLE TISSUE

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY # 7448

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
10 TISSUES FOR Hg ANAL	[illegible signature]	5/23/95	B. [illegible]	5/23/95	0950	10 Analy[illegible]	B. [illegible]	5/23/95	[illegible signature]	5/1[illegible]	10:40[illegible]

Roy F. Weston, Inc.
REAC, Edison, N J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

Project Name
Project Number
RFW Contact
Phone

No: 9581

052295

SHEET NO. 1 OF 1

SAMPLE IDENTIFICATION | ANALYSES REQUESTED

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	TAL METAL	INORG HG		
254	[illegible]		[illegible]	[illegible]	1	[illegible]				
255	[illegible]		[illegible]							
256	[illegible]		[illegible]	[illegible]						
257	[illegible]		[illegible]							
258	[illegible]		X_2	[illegible]						
259	[illegible]		X_4	[illegible]						
260	[illegible]		X_3	[illegible]						
261	[illegible]		X_4	[illegible]						

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions: X_1 = SPARTINA GRASS
X_2 = FIDDLER CRAB
X_3 = BLUE CRAB CLAW, INEDIBLE TISSUE
X_4 = BLUE CRAB CLAW, EDIBLE TISSUE

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY # 00141

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
8 TISSUES. FOR Hg ANALYSIS	[signature]	5/23/95	[signature]	5/23/95	0950	8/Analysis	[signature]	5/23/95	[signature]	5/23	12:40pm

Roy F. [illegible]eston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY [illegible]CORD/LAB WORK REQUEST

Project Name [illegible]
Project Number [illegible]
RFW Contact [illegible] Phone [illegible]

No: 9583

SHEET NO. 1 OF 1

SAMPLE IDENTIFICATION

ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	[illegible] HG			
288	A01516	[illegible]	X	5/[illegible]	1	[illegible]				
289	C015[illegible]		X							
290	A015[illegible]		X							
291	B015[illegible]		X							
292	B01514		X							
293	A01514		X							
294	A01512	DD1	X1							
295	B01512	DD1	X2							
296	C01512	DD1	X3							
297	A01513	DD2	X1	5/13/95						
298	B01513	DD2	X2							
299	C01513	DD2	X3							
300	A25574-01	OUTFALL	X4	5/11/95						
301	A25574-02		X4							
302	A25574-03		X4							
303	A25574-04		X4							
304	A25574-05		X4							
305	A25574-06		X4							
306	A25574-07		X4							

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions: X = CRAB
X1 = TURTLE CARCASS (NO SHELL)
X2 = TURTLE LIVER
X3 = TURTLE BRAIN
X4 = FIDDLER CRAB | WHOLE BODY

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF 8056,
CUSTODY # 7446, 7445

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
19 TISSUES	[illegible]	5/22/95	B Lewis	5/22/95	0950	19/ Analysis	B Lewis	5/24/95	[illegible]	5/24/95	[illegible]
In Hg Analysis!											

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

Project Name [illegible]
Project Number [illegible] 0113
RFW Contact [illegible] Phone [illegible] 4242

No: 9584

052295

SAMPLE IDENTIFICATION

ANALYSES REQUESTED

SHEET NO. 1 OF 1

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	INORG HG			
272	A20638C	[illegible]	X	[illegible]	1	2oz JAR / -10°C				
273	A20[illegible]C	[illegible]	X							
274	A20642C	A20642, A[illegible]	X							
275	A20643C	A20643, A20[illegible]	X							
276	A20646C	A20646, A20[illegible]	X2							
277	A20647C	A20647, A20[illegible]	X3							
278	A20650C	A20650, A20[illegible]2	X2							
279	A20651C	A20651, A20653	X3							
280	A20654C	A20654, A20[illegible], A20[illegible]	X2							
281	A20[illegible]C	A20[illegible], A20[illegible], A20[illegible]	X3							
282	A19763C	A19763, A19[illegible]2	X2							
283	A19764C	A19764, A19[illegible]3	X3							
284	A01504C	A01504 [illegible]	X2							
285	A01505	A01505 [illegible]	X3							
286	A10506C	A01506 A01550	X2							
287	A01507C	A01507, A01501	X3							
288	* SAMPLES WITH A "C"		ARE	COMPOSITE	SAMPLES OF	THOSE	LISTED IN	SAMPLING	LOCATION	

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions: ~~Reac # 285 is A01505 BL~~
X2 = BROWN SHRIMP, EDIBLE
X3 = BROWN SHRIMP, INEDIBLE

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY # 8056, 8059

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
16 TISSUES For Hg Analysis	[signature]	5/22/95	B Lewa	5/23/95	0950	17/Analysis	B Lewa	5/23/95	[signature]	5/23/95	[illegible]

Roy F. \ ston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY ' CORD/LAB WORK REQUEST

Project Name [illegible]
Project Number [illegible]
RFW Contact [illegible] Phone (703) 321-4292

No: 9585

C5255 -

SAMPLE IDENTIFICATION

ANALYSES REQUESTED

SHEET NO. 1 OF 4

REAC #	Sample No.*	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	INORG Hg	ORG AND Hg	PCB	% Solids / % LIPID
725	A206[illegible]C	A20611, A01554, A[illegible], A[illegible]	X_1	[illegible]	[illegible]	4 OZ JARS / 4°C				
726	A01560C	A01560, A206[illegible], A20616, A20618								
727	A20620C	A20620, A206[illegible], A20624, A20626								
728	A20628C	A20628, A20630, A20632, 1005								
729	1010C	1010, 1012, 1014, 1017								
730	1017C	1017, 1020, 1023, 10[illegible]								
731	1027C	1027, 1027, 103[illegible], 1033								
732	A2063[illegible]C	A20635, A01555, A01557, A0155[illegible]	X_2							
733	A01561C	A01561, A20615, A20617, A20619								
734	A20621C	A20621, A20623, A20625, A20627								
735	A20629C	A20629, A20631, A20633, 1009								
736	1011C	1011, 1013, 1015, 1018								

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions: * SAMPLES WITH "C" ARE SAMPLING LOCATION COMPOSITE SAMPLES
X_1 = EDIBLE SHRIMP
X_2 = INEDIBLE SHRIMP

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF 7624, 7628,
CUSTODY # 7633, 8270

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ANALYSIS	[signature]	5/25/93	Jay Patel	5/25/93	10:45 AM	12/STORAGE	Jay Patel	5/25/93	B Lewis	5/25/93	~~1700~~ 1710
12/Analysis	B Lewis	5/25/93	[signature]	5/26/93	8:26 AM						

Roy F. \ ston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY CORD/LAB WORK REQUEST

Project Name [illegible]
Project Number [illegible]
RFW Contact [illegible] Phone [illegible]

No: 9586

05255

SAMPLE IDENTIFICATION — ANALYSES REQUESTED — SHEET NO. 2 OF 4

REAC #	Sample No*	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	[illegible] Hg	Organic Hg	PCB	%Solid/% Lipid
737	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
738	[illegible]	[illegible]								
739	[illegible]	[illegible]	X	[illegible]						
740	A2660-01	A2660								
741	-02									
742	-04									
743	[illegible]									
744	[illegible]									
745	[illegible]									
746	A2611-01	A2611								
747	-02									
748	-03									
749	-04									
750	-05									
751	-06									
752	-07									
753	1016-01	1016								
754	-02									
755	-03									

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions: * SAMPLES WITH "C" ARE SAMPLING LOCATION COMPOSITE SAMPLES
X_1 = [illegible] SHRIM
X = [illegible] CRAB

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF 8270,
CUSTODY # 00113, 7633

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ANALYSIS	[illegible]	5/25/95	[illegible]	5/25/95	10:45 AM	20/SICRAGE	[illegible]	5/25/95	B [illegible]	5/25/95	1200
19/Analysis	B [illegible]	5/25/95	[illegible]	5/26/95	8:27 AM						

Roy F. W[illegible]ston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY [illegible]CORD/LAB WORK REQUEST

Project Name [illegible]
Project Number [illegible]
RFW Contact [illegible] Phone (905) 3[illegible] 4242

No: 9587

SHEET NO. 3 OF 4

05285-

SAMPLE IDENTIFICATION

ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	INORG Hg	ORGANO Hg	PCB	%Solid/%Lipid
756	[illegible]	[illegible]	[illegible]	[illegible]	3	[illegible]				
757	[illegible]									
758	[illegible]									
759	[illegible]									
760	A00520		X1	5/[illegible]						
761	A[illegible]		X1							
762	A00522		X1							
763	A00523		X1							
764	A00524		X1							
765	1001		X3	5/20/95						
766	1002		X2							
767	1003		X41	[illegible]						

G.R.

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions: X = FIDDLER CRAB G.R.
X_1 = TURTLE LIVER ~~X4 = TURTLE LIVER~~
X_2 = TURTLE BRAIN
X_3 = TURTLE BODY/CARCASS

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF 7631
CUSTODY # 00113, 00115

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ANALYSIS	[illegible]	5/25/95	T. Patel	5/25/95	10 45A	12/STORAGE	T. Patel	5/25/95	B. Lewa[illegible]	5/31/95	1700
12/Analysis	B. Lewa[illegible]	5/31/95	[illegible]	6/1/95	8:26A						

001[illegible]

Roy F. Weston, Inc.
REAC, Edison, N J
EPA Contract 68-03-3482

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

Phone

No: 9588

C5235

SAMPLE IDENTIFICATION

ANALYSES REQUESTED

SHEET NO. 4 OF 4

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	INORG HG	ORGANO Hg	PCB	% Solid / % Lipid
765	[illegible]					[illegible]				
769	[illegible]									
770	[illegible]									
771	[illegible]									
772	[illegible]									
773	[illegible]									
774	[illegible]									
775	[illegible]									
776	[illegible]									
777	A [illegible]		X1							
778	A [illegible]									
779	A [illegible]									
780	A [illegible]									
781	A0 1000									
782	A03126									
783	A01333									
784	1005									
785	1007									

Matrix:

SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:
X1 = INEDIBLE BLUE CRAB
X2 = EDIBLE BLUE CRAB

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY # 7630

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ANALYSIS	[signature]	5/24/5	[signature]	5/25/5	10:45 AM	18/STORAGE	[signature]	5/25/95	[signature]	5/25	1700
18/Analysis	[signature]	5/25/95	[signature]	5/26/95	3:27pm						

003100

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY R. ORD/LAB WORK REQUEST

Project Name: LCP CHEMICAL, GA
Project Number: 03347-040-001-0113-0
RFW Contact: JOHN JOHNSON Phone: 908-321-4200

No: 9590

44LCP

SHEET NO. 1 OF 1

SAMPLE IDENTIFICATION | ANALYSES REQUESTED

	REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	ORGANIC MERCURY			
#7	1	A03121	PURVIS CREEK	X_1	5/18/95	1	2oz GLASS/0°C	X			
#6	2	A01560C	REFERENCE	X_1	5/19/95	1		X			
#1	3	A00570	DD5	X_3	5/22/95	1		X			
#2	4	A00572	DD5	X_3	5/22/95	1		X			
5	5	A01553	REFERENCE	X_2	5/20/95	1		X			
#8	6	A03123	PURVIS CREEK	X_1	5/18/95	1		X			
#4	7	A01541	ST. # 35	X_4	5/18/95	1	4oz GLASS/0°C	X			
#13	8	B01534C	PURVIS CREEK	X_1	5/19/95	1	2oz GLASS/0°C	X			
#10	9	103601	ST. # 17	X_6	5/19/95	1		X			
#12	10	A2557406	OUTFALL	X_6	5/17/95	1		X			
11	11	A2061102	ST # 17	X_6	5/20/95	1		X			
#3	12	A00574	DD6	X_3	5/22/95	1		X			
#9	13	1016-06	ST # 10	X_5	5/20/95	1		X			

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions:
MATRIX = X = TISSUE
X_1 = SHRIMP X_3 = TURTLE X_6 = SNAIL
X_2 = SHRIMP SHELL X_4 = SPARTINA X_5 = CRAB

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[signature]	5/25/95	B. Loren	5/25/95	1745	13 Analysis	B. Loren	5/25/95	[signature]	5/26/95	

001160

Roy F. . .ston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY 'CORD/LAB WORK REQUEST

Project Name [illegible]
Project Number [illegible]
RFW Contact [illegible] Phone [illegible] 9242

No: 9600

SHEET NO. 1 OF 1

SAMPLE IDENTIFICATION | ANALYSES REQUESTED

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	INORG Hg	ORGANO Hg	PCB	% MOIST	% LIPID
216	1035-01		X1	5/2?	3	4 oz.					
217					3						
218	03				3						
219	04				3						
220	05				3						
221	06				3						
222	1036-01		X2		3						
223	02				3						
224	03				3						
225	04				3						
226	-05				3						
227	-06				3						
228	-07				3						
229	A00677	A00677	X3	5/22/95	3						

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions: X_1 = SNAIL / REFERENCE
X_2 = SNAIL / STATION #17-18
X_3 = TURTLE EGG

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY # 00113, 00115

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[signature]	5/25/95	B. Lewis	5/26/95	0945	14/Analysis	B. Lewis	5/31/95	Jessica Y.	5/31/95	[illegible]

Roy F. ..eston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY 'CORD/LAB WORK REQUEST

Project Name: LCP CHEMICAL
Project Number: 03347-046-001-0113-01
RFW Contact: Rich Henry Phone: (732) 321-4242

No: 9601

053075

SHEET NO. 1 OF 1

SAMPLE IDENTIFICATION — ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	INORG. Hg	PCB	ORGANO Hg	% Solid	% Lipid
895	A00575	DD5	X1	5/23/95	3	2 oz JAR/-10°C	↓	↓		↓	↓
896	A00576	↓	↓	↓	↓	↓	↓	↓		↓	↓
897	A00606	↓	↓	↓	↓	↓	↓	↓		↓	↓
898	A00612	↓	↓	↓	↓	↓	↓	↓		↓	↓
899	A00615	↓	↓	↓	↓	↓	↓	↓		↓	↓
900	A00616	↓	↓	↓	↓	↓	↓	↓		↓	↓
901	052495	CO2 BLK / METALS	X2	5/24/95	1	32 oz JAR/AMBER	↓				
902	052595	CO2 BLK / METALS	X2	5/25/95	1	32 oz JAR/AMBER	↓				

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions:
X1 = TURTLE EGG
X2 = DRY ICE (CO2) BLANK FOR Metals

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY # 00115

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[signature]	5/30/95	B. Lewis	5/30/95	1945	All/Analysis	B. Lewis	5/31/95	[signature]	5/31/95	8:40

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

Project Name: LCP CHEMICAL
Project Number: [illegible]
RFW Contact: [illegible] Phone: [illegible] 4242

No: 9602

SHEET NO. 1 OF 1

SAMPLE IDENTIFICATION — ANALYSES REQUESTED

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	INORG Hg	ORGANO Hg	PCB	% Solid	% Lipid
035	1274		X	5/ /	3	[illegible]					
036	1276										
037	1275										
038	1285		X4								
039	1287										
040	1281										
041	1273										
042	1275										
043	1277										
044	1279										
045	1311-01		X5								
046	1311-02										
047	1311-03										

Matrix:
SD - Sediment, DS - Drum Solids, DL - Drum Liquids, X - Other
PW - Potable Water, GW - Groundwater, SW - Surface Water, SL - Sludge
S - Soil, W - Water, O - Oil, A - Air

Special Instructions:
X3 = EDIBLE BLUE CRAB
X4 = INEDIBLE BLUE CRAB
X5 = SNAIL

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY # 00137, 00132, 00133

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[signature]	5/3/95	[signature]	5/3/95	1430	13/Analyz.	[signature]	5/3/95	[signature]	5/3/95	2:40pm

Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
908-321-4200 • Fax 908-494-4021

Aqua Survey Inc.
499 Point Breeze Road
Flemington, NJ 08822
Attn: Jim Todd

May 25, 1995

Project # 3347-040-001-0113, LCP Chemical

As per Weston REAC Purchase Order number 08-32441, dated 05/25/95, please analyze samples according to the following parameters:

Analysis/Method	Matrix	# of samples
Whole-phase sediment toxicity test-10 day(Penaeus vanname)/ See attached protocol	Soil	3
Whole-phase sediment toxicity test-10 day(Leptocheirus plumulosus)/See attached protocol	Soil	5
Loss on Ignition/AASHTO T 267-86 See attached method	Soil	12
Organo-mercury/See attached method	Tissue	12
Data package as per or attached Deliverables Requirements		

Samples are expected to arrive at your laboratory between 5/19-26/95. All applicable QA/QC analysis as per method, will be performed on our sample matrix. The complete data package is due at REAC 21 business days after receipt of sample. The complete data package must include all items on the deliverables checklist. Analysis for organo-mercury will be subcontracted by AquaSurvey to Battelle. These analyses will be prepaid by WESTON/REAC.

Please submit all reports and technical questions concerning this project to **John Johnson at (908) 321-4248** or fax to (908) 494-4020. Any contractual question, please call Cindy Snyder at (908) 321-4296. Thank you

Sincerely,

George Armstrong
Data Validation and Report Writing Group Leader
Roy F. Weston, Inc. / REAC Project

GA:cs Attachments

cc. R. Singhvi
M. Springer
0113\non\mem\9505\sub\0113Con1
V. Kansal
Subcontracting File
B. Lewan
C. Snyder
M. Huston
G. Armstrong

Date:	February 6, 1996
To:	Mark Huston, Biological Group Leader
From:	Yi-Hua Lin, Organic Group Leader, Analytical Section, REAC
Thru:	Vinod Kansal, Section Leader, Analytical Section, REAC
Subject:	Analytical Results for one LCP Chemical Soil Sample #S668

Enclosed please find the datasheet for sample #S668. Originally sample was extracted and analyzed for BNAs, the sample was later requested for PCB analysis. The solvent was exchanged from DCM to hexane and sample was reanalyzed for PCB. Since extraction procedure was followed BNA's SOP the results of Aroclor 1268 should be considered as estimate.

cc Central File (-0113)

PCBs ANALYSIS DATA SHEET
GC /ECD PCBs by Gas Chromatography
Results Reported as (µg/kg)

PROJECT NAME	LCP CHEMICAL	Sample Amount	30 00 gr
PROJECT No	03347-040-001-0113-01	Percent Solid	29 6 %
SAMPLE ID	S668	Extract Vol	1 mL
SAMPLE LOCATION		Extract D F	1
		MATRIX	Soil
		Analysis Level	low

Results calculated using Signal 1: DB-608 column

COMPOUND	R.T. (min.)	PEAK HEIGHT	STD R.T. (min.)	AVERAGE R F	Instrument Conc (µg/L)	Sample Conc (µg/kg)		QL (µg/kg)	AVERAGE CONC. (µg/kg)
AROCLOR 1268	16.138	2416.05	16.178	0.0864	13982	1575	E	28	2289
	18.646	11586.00	18.686	0.2822	20528	2312	E		
	18.846	8578.24	18.860	0.2397	17894	2015	E		
	19.970	8868.57	20.018	0.1882	23562	2653	E		
	22.725	19337.00	22.788	0.3767	25666	2890	E		

R.T. Denotes Retention Time.
R.F. Denotes Response Factor.
STD Denotes Standard.
Conc. Denotes concentration.
QL denotes Quantitation Limit. Samples with concentrations less than
the Quantitation Limit are flagged as "J" and concentration is considered approximate
E denotes value exceeds highest linear point on calibration range of 500 ppb. and results
are considered approximate.

REAC, E n, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHA OF CUSTODY RECORD

Project Name: LCP
Project Number: 03347 040 001 011301
RFW Contact: Rich Henry Phone: (908) 321-4200

No: 00119

SHEET NO 2 OF 2

05 25 95

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	TAL Metals	TAL Metals	Pest/PC	PAH
663	C24166	LCP 17-18	W	5/21/95	1	1l poly/4°C, HNO_3	X			
~~664~~	~~G24167~~	~~LCP 19-20~~ (Rd)								
~~665~~	~~H24~~ (Rd)									
664 ~~666~~	G,H24167	LCP 19-20			2	1l poly/4°, HNO_3	X			
665 ~~667~~	D24168	LCP 35-36			1		X			
666 ~~668~~	A20613	Reference	W	5/19/95	1	1l poly/4°, HNO_3	X			
667 ~~669~~	A20612	Reference			1		X			
661 ~~670~~	K24160	LCP 10-11	SD	5/20	1	8oz/ 4°C	X	X	X	X

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions: Water samples on this COC have been filtered in the field *

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Samples G,H24167, C24166 and D24168 have been collect from "Hot Zone".

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analysis	Rich Henry	5/24/95	B. Lewan	5/25/95	1015	All Metals	B. Lewan	5/25/95	[illegible]	5/25/95	2:15
						All Analyses	B. Lewan	5/25/95	[illegible]	5/25/95	5:15
							Colleen Egan	6/20/95	B. Lewan	6/19/95	1300

FORM #4 8/94

* Sample A20612 is a whole water sample.

GPO 1994 383 015

Appendix F
Analytical Report for Samples Collected in July 1995
LCP Site
Brunswick, GA
April 1997

ANALYTICAL REPORT

Prepared by
Roy F. Weston, Inc.

LCP Chemical Site
Brunswick, GA

November, 1995

EPA Work Assignment No. 0-113
WESTON Work Order No. 03347-040-001-0113-01
EPA Contract No. 68-C4-0022

Submitted to
M. Sprenger
EPA-ERT

11/6/95

M. Huston — Date
Task Leader

11/7/95

V. Kansal — Date
Analytical Section Leader

R. Shapot — Date
Project Manager

Analysis by:
REAC
Manhattan College
Aqua Survey
Battelle

Prepared by:
G. Karustis

Reviewed by:
M. Barkley

0113\DEL\AR\9511\REPORT

Section II

*this QA/QC includes the results for total, elemental, methyl, dimethyl and diethyl mercury

Section III

Appendices will be furnished on request.

Section II

* this QA/QC includes the results for total, elemental, methyl, dimethyl and diethyl mercury

Section III

Appendices will be furnished on request.

INTRODUCTION

REAC, in response to ERT WA # 0-113, provided analytical support for water, sediment and tissue samples collected at the LCP Chemical Site in Brunswick, GA. This support involved the analysis of water, sediment and tissue samples and the subcontracted analyses of sediment samples as described in the following table. The support also included QA/QC, data review and the preparation of a report summarizing the analytical methods, results, and the QA/QC results.

The samples were treated with procedures consistent with those described in SOP #1008 and are summarized in the following table:

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
00936	5	7/9/95	7/11/95	Sediment	PCB, TAL Metals	REAC
00936	12	7/10/95	7/11/95	Sediment	PCB, TAL Metals	REAC
00934**	10	7/8/95	7/11/95	Edible Fish Tissue	Hg, PCB % Moisture % Lipids	REAC
00935**	8	7/8/95	7/11/95	Edible Fish Tissue	Hg, PCB % Moisture % Lipids	REAC
00578	1	7/11/95	7/12/95	Dry Ice	Mercury	REAC
01157	3	7/11/95	7/14/95	Sediment	Mercury, PCB	REAC
01157	12	7/12/95	7/14/95	Sediment	Mercury, PCB	REAC
00941	2	7/12/95	7/14/95	Rail Feathers	Mercury	REAC
00941	2	7/12/95	7/14/95	Rail Liver	% Moisture, % Lipids PCB, Mercury	REAC
00941	2	7/12/95	7/14/95	Rail Breast Muscle	% Moisture, % Lipids PCB, Mercury	REAC
00941	2	7/12/95	7/14/95	Rail Body	% Moisture, % Lipids PCB, Mercury	REAC
00941	10	7/13/95	7/14/95	Whole Body Fish	% Moisture, % Lipids PCB, Mercury	REAC
00941	1	7/12/95	7/14/95	Turtle Egg Shell	Mercury	REAC
00943	3	7/13/95	7/14/95	Whole Body Fish	% Moisture, % Lipids PCB, Mercury	REAC

* COC # denotes Chain of Custody number

** at the request of the client, the inedible fish were not analyzed

The sample table is continued on the next page

Sample Table (Cont)

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
00946	6	7/13/95	7/15/95	Sediment	AVS/SEM	Manhattan College
01190	20	7/11/95	7/13/95	Sediment	TAL Metals, PCB	REAC
00944	1	7/13/95	7/15/95	Carcass	Mercury, PCB % Moisture, % Lipids	REAC
00944	1	7/13/95	7/15/95	Breast Muscle	Mercury, PCB % Moisture, % Lipids	REAC
00944	1	7/13/95	7/15/95	Feathers	Mercury, PCB % Moisture, % Lipids	REAC
00944	1	7/13/95	7/15/95	Liver	Mercury, PCB % Moisture, % Lipids	REAC
00939	18	7/10/95	7/14/95	Sediment	PCB, Hg	REAC
00945	14	7/14/95	7/15/95	Tissue	Mercury, PCB % Moisture, % Lipids	REAC
01199	6	7/13/95	7/15/95	Sediment	Organic Mercury	Aqua Survey/ Battelle
01179	3	7/14/95	7/15/95	Water	Total Mercury, Elemental Mercury, Organic Mercury	Aqua Survey/ Battelle

* COC # denotes Chain of Custody number

The sample table is continued on the next page

Sample Table (Cont)

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
01020	3	7/15/95	7/18/95	Turtle Carcass	Mercury, PCB % Moisture, % Lipids	REAC
01020	3	7/15/95	7/18/95	Turtle Liver	Mercury, PCB % Moisture, % Lipids	REAC
01020	7	7/15/95	7/18/95	Turtle Egg	Mercury, PCB % Moisture, % Lipids	REAC
01020	5	7/17/95	7/18/95	Turtle Hatchling	Mercury, PCB % Moisture, % Lipids	REAC
01021	5	7/17/95	7/18/95	Turtle Eggshell	Mercury	REAC
00625	1	7/14/95	7/20/95	Dry Ice	Mercury	REAC
01024	4	7/18/95	7/21/95	Rail Carcass	Mercury, PCB % Moisture, % Lipids	REAC
01024	4	7/18/95	7/21/95	Rail Liver	Mercury, PCB % Moisture, % Lipids	REAC
01024	4	7/18/95	7/21/95	Rail Feathers	Mercury	REAC
01024	4	7/18/95	7/21/95	Rail Muscle	Mercury, PCB % Moisture, % Lipids	REAC
00580	1	7/18/95	7/24/95	Dry Ice	Mercury	REAC
00583	1	9/21/95	9/26/95	Dry Ice	Mercury	REAC
00889	1	9/19/95	9/21/95	Grasshopers	Mercury, Moisture PCBs, Lipids	REAC
00889	2	9/20/95	9/21/95	Grasshopers	Mercury, Moisture PCBs, Lipids	REAC
00889	3	9/19/95	9/21/95	Spartina Grass	Mercury, Moisture PCBs	REAC
00889	6	9/20/95	9/21/95	Spartina Grass	Mercury, Moisture PCBs	REAC

* COC # denotes Chain of Custody number

The sample table is continued on the next page

Sample Table (Cont)

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
00579	2	7/12/95	7/21/95	Rail Body	Organo Mercury	Aqua Survey/ Battelle
00579	1	7/13/95	7/21/95	Whole Body Fish	Organo Mercury	Aqua Survey/ Battelle
00579	1	7/8/95	7/21/95	Edible Fish	Organo Mercury	Aqua Survey/ Battelle
00579	1	7/15/95	7/21/95	Turtle Carcass	Organo Mercury	Aqua Survey/ Battelle
00579	1	7/15/95	7/21/95	Turtle Liver	Organo Mercury	Aqua Survey/ Battelle
00579	1	7/14/95	7/21/95	Tissue	Organo Mercury	Aqua Survey/ Battelle
00581	5	8/25/95	8/28/95	Turtle Eggs	Mercury	REAC
01022	3	8/2/95	8/3/95	Water	Total Mercury Elemental Mercury Organic Mercury	Aqua Survey/ Battelle
02108	10	7/13/95	8/17/95	Sediment Extract	Mercury	REAC
00872	5	8/15/95	8/17/95	Clapper Rail Carcass	Mercury, PCB % Moisture, % Lipids	REAC
00872	5	8/15/95	8/17/95	Feathers	Mercury	REAC
00872	5	8/15/95	8/17/95	Breast Muscle	Mercury, PCB % Moisture, % Lipids	REAC
00872	5	8/15/95	8/17/95	Liver	Mercury, PCB % Moisture, % Lipids	REAC

* COC # denotes Chain of Custody number

The sample table is continued on the next page

Sample Table (Cont)

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
00873	2	8/15/95	8/17/95	Clapper Rail Carcass	Mercury, PCB % Moisture, % Lipids	REAC
00873	2	8/15/95	8/17/95	Feathers	Mercury, PCB % Moisture, % Lipids	REAC
00873	2	8/15/95	8/17/95	Breast Muscle	Mercury, PCB % Moisture, % Lipids	REAC
00873	2	8/15/95	8/17/95	Liver	Mercury, PCB % Moisture, % Lipids	REAC
00877	5	8/25/95	8/25/95	Turtle Eggs	Mercury, PCB % Moisture, % Lipids	REAC
01099	1	8/22/95	8/22/95	Dry Ice	Hg	REAC

* COC # denotes Chain of Custody number

CASE NARRATIVE

PCB Package E 294

The end of sequence continuing calibration check standards run on 7/19/95, 7/21/95, 7/24/95 and 7/27/95 exceeded the acceptable QC limits for Aroclor 1260. The data are not affected because no samples were quantified by these standards.

The end of sequence continuing calibration check standards run on 7/19/95, 7/21/95 and 7/24/95 exceeded the acceptable QC limits for Aroclor 1268. The data are not affected because no samples were quantified by these standards.

The percent recovery of decachlorobiphenyl was not calculated because of coelution with the last peak of Aroclor 1268. The data are not affected.

The MS/MSD recoveries of Aroclor 1268 in samples B 4439 and B 4447 were not calculated because the concentrations of the analyte in the samples were higher than the concentrations spiked.

PCB Package E 312

The end of sequence continuing calibration check standards run on 7/28/95, 7/29/95, 8/1/95, 8/3/95 and 8/4/95 exceeded the acceptable QC limits. The data are not affected because no samples were quantified by these standards.

Only the percent recoveries for the surrogate tetrachloro-m-xylene were calculated because the second surrogate, decachlorobiphenyl, coeluted with the last peak in Aroclor 1268. The data are not affected.

Surrogates were not added to sample 04478 by mistake. The data for this sample should be regarded as estimated.

Recoveries of Aroclor 1268 were not calculated for the MS/MSD pairs for samples C 4483, A 4455 and A 4472 because of high concentrations of analyte in the samples. The data are not affected

PCB Package E 326

The samples were extracted and analyzed within the holding time, but, because of low surrogate recoveries some of the samples were re-extracted. Samples B 04351, 04489, 04490, 04491, 04496, 04497, B 04346, B 04348, B 04349, B 04350, B 04355, B 04357, B 04338 and B 04340 were extracted beyond the holding time. The results for these samples should be regarded as estimated.

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Only the percent recoveries for the surrogate tetrachloro-m-xylene were calculated because the second surrogate, decachlorobiphenyl, coeluted with the last peak in Aroclor 1268. The results for samples SBLK 071795, 04494, 04495, SBLK 081095, B 04351 MSD, 04489, 04496 and B 04350 should be regarded as estimated because the surrogate tetrachloro-m-xylene exceeded the acceptable QC limits.

Two samples, 04491 and B 04351 were chosen for the MS/MSD analyses. The percent recoveries of Aroclor 1268 for sample 04491 were not calculated because of the high concentration of Aroclor 1268 in the sample. One percent recovery for sample B 04351 exceeded the acceptable QC limit. The data are not affected.

PCB Package E 303

Method blank 071295 TL contained 12 ug/kg Aroclor 1268 and method blank 071795 TL contained 1 ug/kg Aroclor 1268. Since the concentrations of Aroclor 1268 in the samples run under this blank were greater than five times the concentrations in the blanks, the data are not affected.

Only the percent recoveries for the surrogate tetrachloro-m-xylene were calculated because the second surrogate, decachlorobiphenyl, coeluted with the last peak in Aroclor 1268.

If compared to the CLP soil limits, the majority of the recoveries of tetrachloro-m-xylene exceed the advisory QC limits. Because no surrogate QC limits have been established for tissue matrices and because tissue matrices cannot be compared to soils, the data will not be qualified.

Sample A 04362 was partially lost during extraction and the surrogate recovery (34%) was less than those of other samples in this data package (44-71%). The data for this samples should be regarded as estimated.

The MS/MSD percent recoveries for samples A 04474 and A 03862 were very high possibly due to the presence of high concentrations of Aroclor 1268. The data are not affected.

PCB in Tissue Package E 323

Only the percent recoveries for the surrogate tetrachloro-m-xylene were calculated because the second surrogate, decachlorobiphenyl, coeluted with the last peak in Aroclor 1268.

If compared to the CLP soil limits, the majority of the recoveries of tetrachloro-m-xylene exceed the advisory QC limits. Because no surrogate QC limits have been established for tissue matrices and because tissue matrices cannot be compared to soils, the data will not be qualified.

CASE NARRATIVE (Cont)

Two samples, 04491 and B 04351 were chosen for the MS/MSD analyses. The percent recoveries of Aroclor 1268 for sample 04491 were not calculated because of the high concentration of Aroclor 1268 in the sample. One percent recovery for sample B 04351 exceeded the acceptable QC limit. The data are not affected.

PCB Package E 303

Method blank 071295 TL contained 12 ug/kg Aroclor 1268 and method blank 071795 TL contained 1 ug/kg Aroclor 1268. Since the concentrations of Aroclor 1268 in the samples run under this blank were greater than five times the concentrations in the blanks, the data are not affected.

Only the percent recoveries for the surrogate tetrachloro-m-xylene were calculated because the second surrogate, decachlorobiphenyl, coeluted with the last peak in Aroclor 1268.

If compared to the CLP soil limits, the majority of the recoveries of tetrachloro-m-xylene exceed the advisory QC limits. Because no surrogate QC limits have been established for tissue matrices and because tissue matrices cannot be compared to soils, the data will not be qualified.

Sample A 04362 was partially lost during extraction and the surrogate recovery (34%) was less than those of other samples in this data package (44-71%). The data for this samples should be regarded as estimated.

The MS/MSD percent recoveries for samples A 04474 and A 03862 were very high possibly due to the presence of high concentrations of Aroclor 1268. The data are not affected

PCB in Tissue Package E 323

Only the percent recoveries for the surrogate tetrachloro-m-xylene were calculated because the second surrogate, decachlorobiphenyl, coeluted with the last peak in Aroclor 1268.

If compared to the CLP soil limits, the majority of the recoveries of tetrachloro-m-xylene exceed the advisory QC limits Because no surrogate QC limits have been established for tissue matrices and because tissue matrices cannot be compared to soils, the data will not be qualified

PCB in Tissue Package E 374

Only the percent recoveries for the surrogate tetrachloro-m-xylene were calculated because the second surrogate, decachlorobiphenyl, coeluted with the last peak in Aroclor 1268.

If compared to the CLP soil limits, the majority of the recoveries of tetrachloro-m-xylene exceed the advisory QC limits. Because no surrogate QC limits have been established for tissue matrices and because tissue matrices cannot be compared to soils, the data will not be qualified.

PCB in Tissue Package E 397

Only the percent recoveries for the surrogate tetrachloro-m-xylene were calculated because the second surrogate, decachlorobiphenyl, coeluted with the last peak in Aroclor 1268.

If compared to the CLP soil limits, the majority of the recoveries of tetrachloro-m-xylene exceed the advisory QC limits. Because no surrogate QC limits have been established for tissue matrices and because tissue matrices cannot be compared to soils, the data will not be qualified.

Mercury in Water Extracts Package E 360

The data were examined and were found to be acceptable.

Mercury in Sediment Package E 318

The data were examined and were found to be acceptable.

CASE NARRATIVE (Cont)

Mercury in Tissue Package E 324

The percent solids were not determined for the following samples because of insufficient sample:

A 04358	A 04360	Eggshell 1	Eggshell 2
Eggshell 3	Eggshell 4	Eggshell 5	LCPN B9501A
LCPN B 9502 B		LCP SM 9501 B	
LCP SM 9502 E			

The results for these samples are reported on an "as received" basis.

Mercury in Tissue Package E 361

The data were examined and were found to be acceptable.

Mercury in Diamond Back Terrapin Package E 369

An MS/MSD pair could not be run because of insufficient sample.

Metals in Tissue Package E 402

The data were examined and were found to be acceptable.

Metals in Sediment Package E 334

The data were examined and were found to be acceptable.

Metals in Sediment Package E 319

The data were examined and were found to be acceptable.

Mercury in Water, Sediment and Tissue Package E 364

The method blank for the water matrix contained 0.486 ng/l total mercury. The data are not affected because each sample contained more than 4.86 ng/l total mercury.

AVS SEM Package E 351

The data were examined and were found to be acceptable.

SUMMARY of ABBREVIATIONS

B	The analyte was found in the blank
BFB	Bromofluorobenzene
BPQL	Below the Practical Quantitation Limit
C	Centigrade
D	(Surrogate Table) this value is from a diluted sample and was not calculated (Result Table) this result was obtained from a diluted sample
CLP	Contract Laboratory Protocol
COC	Chain of Custody
CONC	Concentration
CRDL	Contract Required Detection Limit
DFTPP	Decafluorotriphenylphosphine
DL	Detection Limit
E	The value is greater than the highest linear standard and is estimated
EMPC	Estimated maximum possible concentration
J	The value is below the method detection limit and is estimated
HHL	High Hazard Laboratory, Brunswick, GA
IDL	Instrument Detection Limit
ISTD	Internal STanDard
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MI	Matrix Interference
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular Weight
NA	either Not Applicable or Not Available
NC	Not Calculated
NR	Not Requested
NS	Not Spiked
% D	Percent Difference
% REC	Percent Recovery
PQL	Practical Quantitation Limit
PPBV	Parts per billion by volume
QL	Quantitation Limit
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
SIM	Selected Ion Mode
U	Denotes not detected

m^3	cubic meter	kg	kilogram
l(L)	liter	g	gram
dl	deciliter	cg	centigram
ml	milliliter	mg	milligram
ul	microliter	ug	microgram
		ng	nanogram
		pg	picogram

* denotes a value that exceeds the acceptable QC limit

Abbreviations that are specific to a particular table are explained in footnotes on that table

Revision 3/10/95

Analytical Procedure for PCBs in Soil

Extraction Procedure

The soil samples were extracted by the Soxhlet method. A 30 gram aliquot was mixed with a surrogate solution consisting of tetrachloro-m-xylene and decachlorobiphenyl. 30 grams sodium sulfate and the mixture was Soxhlet extracted for 16 hours with 300 ml (1:1) hexane/acetone (1:1). The samples were concentrated to a final volume of 5.0 ml before analysis.

Gas Chromatographic Analysis

The extract was analysed for PCBs using simultaneous dual column injections. The analysis was done on an HP 5890 GC/ECD system, equipped with an HP 7673A automatic sampler, and controlled with an HP-CHEM STATION. The gas chromatograph is equipped with Electronic Pressure Control operated in the constant flow mode for both columns. The following conditions were employed:

First Column	DB-608, 30 meter, 0.53 mm fused silica capillary, 0.83 um film thickness
Second Column	RT-x-1701, 30 meter, 0.53mm fused silica capillary, 0.50 um film thickness
Injector Temperature	250° C
Detector Temperature	325° C
Temperature Program	150°C for 1 minute 7°C/min to 265°C 18 min at 265°
Volume Injected	2 ul

A fingerprint gas chromatogram was run using each of the seven Aroclor mixtures; calibration curves were run only if a particular Aroclor was found in the sample. The gas chromatographs were calibrated using Aroclor 1260 and Aroclor 1268 standards at 250, 500, 1000, 2000 and 5000 ug/L. The response from each mixture were used to calculate the response factors (RF) of each analyte. The average RF was used to calculate the concentrations of the pesticides in the samples. Quantification was based on the DB-608 column (signal 1) and identity of the analyte was confirmed using the Rtx-1701 column (signal 2).

The results, listed in Table 1.1, were calculated from the following formula:

$$C_{ug/kg} = \frac{A \times V_t \times DF}{RF_{ave} \times V_i \times W \times D}$$

where

$C_{ug/kg}$	= Concentration of Analyte (ug/kg)
A	= Area or Peak Height
V_t	= Final Extract Volume (ml)
DF	= Dilution Factor
RF_{ave}	= Average Response Factor
V_i	= Volume of extract injected (ul)
W	= Weight of Sample (g)
D	= Decimal percent solids

where

$$RF = \frac{A}{\text{total pg injected}}$$

$$RF_{ave} = \frac{RF_1 + \ldots + RF_n}{n}$$

and

A = Area (or height) of Peak
n = number of samples

Analytical Procedure for PCBs in Tissue

Homogenization Procedure

The entire sample was homogenized with dry ice using a variable speed laboratory blender. After homogenization was completed, the contents of the blender, (tissue and dry ice) were quantitatively transferred to clean jars and the dry ice was allowed to sublime overnight in a freezer at -10° C. Homogenization of animal mass greater than 20 grams was carried out in several steps.

Extraction Procedure

The tissue samples were extracted by the Soxhlet method. A 10 gram aliquot of homogenate was mixed with 30 grams sodium sulfate, a surrogate solution consisting of tetrachloro-m-xylene and decachlorobiphenyl, and the mixture was Soxhlet extracted for 16 hours with 250 ml dichloromethane. The sample extracts were concentrated to 10 ml and subjected to gel permeation chromatograpy (GPC) cleanup and solvent exchanged with hexane. The hexane solution was cleaned with fluorisil and sulfuric acid prior to analysis.

Gas Chromatographic Analysis

The extract was analyzed for PCBs using simultaneous dual column injections. A surrogate mixture consisting of tetrachloro-m-xylene and decachlorobiphenyl was added. The analysis was done on an HP 5890 GC/ECD system, equipped with an HP 7673A automatic sampler, and controlled with an HP-CHEM STATION. The following conditions were employed:

First Column	DB-608, 30 meter, 0.53mm fused silica capillary, 0.83 um film thickness
Injector Temperature	250° C
Detector Temperature	325° C
Temperature Program	150°C for 1 minute 7°C/min to 265°C 18 min at 265°
Second Column	RTx-1701, 30 meter, 0.53mm fused silica capillary, 0.50 um film thickness
Injector Temperature	250° C
Detector Temperature	325° C
Temperature Program	150° C for 1 minute 7°C/min to 265°C 18 min at 265°

A fingerprint chromatogram was run using each of the seven Aroclor mixtures; calibration curves were run only if a particular Aroclor was found in the sample. The gas chromatographs were calibrated using Aroclor 1260 and Aroclor 1268 standards at 20, 50, 100, 200, and 500 ug/L. The results from each mixture were used to calculate the response factor (RF) of each analyte and the average Response Factor was used to calculate the concentration of pesticide in the sample. Quantification was based on the DB-608 column (signal 1) and the identity of the analyte was confirmed using the RTx-1701 column (signal 2).

The results, listed in the following tables

Killifish	1.2
Clapper Rails	1.3
Spot	1.4
Diamond Back Terrapin	1.5
Spartina Grass	1.6
Grasshoppers	1.7
Results of the Analysis for PCBs in Blanks for Tissue Samples	1.8
Correlation Table of Samples and Blanks	1.9

were calculated by using the following formula:

$$C_{ug/Kg} = \frac{A \times V_t \times DF}{RF_{ave} \times V \times W_s \times D}$$

where

A	= Area or Peak Height
V_t	= Volume of Extract (ml)
DF	= Dilution Factor
RF_{ave}	= Average Response Factor
V	= Volume injected (ul)
W_s	= Weight of Sample (g)
D	= Decimal percent solids

where

$$RF = \frac{A}{\text{total pg injected}}$$

$$RF_{ave} = \frac{RF_1 + \ldots + RF_n}{n}$$

and

A = Area of Peak
n = number of samples

Revision of 6/30/94

Analytical Procedure for TAL Metals in Sediment

One gram of sample, weighed to 0.01 g accuracy, was thoroughly mixed with 10 ml 1:1 nitric acid:water, digested according to method #3050 and analyzed by Method 7000/6010. These methods are contained in Test Methods for Evaluating Solid Wastes, USEPA, SW-846, September, 1987.

Mercury was analyzed separately on a Varian SpectrAA-300 Atomic Absorption Spectrophotometer equipped with a Varian VGA-76 vapor gas analyzer using method 7471 as given by Test Methods for Evaluating Solid Waste, USEPA, SW-846, September, 1986. Results of the analyses are listed in Table 1.10.

Analytical Procedure for Mercury in Extracts

Mercury was analyzed on a Varian SpectrAA-300 Atomic Absorption Spectrophotometer equipped with a Varian VGA-76 vapor gas analyzer using modified method 7470 as given by "Test Method for Evaluating Solid Waste, Sept. 1986", USEPA SW-846. The results are listed in Table 1.11

Analytical Procedure for Mercury in Sediment

One half gram of sample, weighed to 0.01 g accuracy, was thoroughly mixed with 5 ml deionized water and 5 ml aqua regia and digested according to SW-846 method 7471. Mercury was analyzed on a Varian SpectrAA-300 Atomic Absorption Spectrophotometer equipped with a Varian VGA-76 vapor gas analyzer. Results of the analyses are listed in Table 1.12

Analytical Procedure for Mercury in Tissue

A 0.75 g sample, weighed to centigram accuracy, was analyzed for mercury on a Varian SpectrAA-20, -300 Atomic Absorption Spectrophotometer equipped with a VGA-76 vapor gas analyzer using modified USEPA SW-846 Method 7471. The modification consisted in using 8 ml aqua regia and allowing the sample to stand in a water bath for 5-8 minutes prior to digestion. A dry ice blank was analyzed with the samples to check for any contamination in the dry ice.

The results for the tissue samples are listed in Tables 1.11 through 1.15 as follows:

Tissue	Table
Killifish	1.13
Clapper Rails	1.14
Spot	1.15
Diamond Back Terrapin	1.16
Spartina Grass	1.17
Grasshoppers	1.18
Carbon Dioxide	1.19

Analytical Procedure for Organomercury

The subcontract laboratory determined the concentration of the organomercury using the procedure given in "Determination of Picogram Levels of Methylmercury by Aqueous Phase methylation, Followed by Cryogenic Gas Chromatography with Cold Vapor Atomic Fluorescence Detection" N. Bloom, Can. J. Fish. Aquat. Sci., Vol. 46, 1989. The results for the water samples are listed in Table 1.20. The results for the sediment and tissue samples are listed in Table 1.21.

Analytical Procedure for Acid Volatile Sulfides and Simultaneously Extractable Metals

The subcontract laboratory determined the concentration of the acid volatile sulfides and simultaneously extractable metals using the USEPS Procedure given in "Determination of Acid Volatile Sulfides and Simultaneously Extractable Metals in Sediment". The results are listed in Table 1.22

Table 1.1 Results of the Analysis for PCBs in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	SBLK071295		B 4438		B 4439		B 4440		B 4441		B 4442	
Location	-		41A		52		53		54		55	
% Solids	100		32		27		58		37		45	
	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)
AROCLOR 1016	U	42	U	130	U	150	U	72	U	110	U	92
AROCLOR 1221	U	83	U	250	U	300	U	140	U	220	U	180
AROCLOR 1232	U	42	U	130	U	150	U	72	U	110	U	92
AROCLOR 1242	U	42	U	130	U	150	U	72	U	110	U	92
AROCLOR 1248	U	42	U	130	U	150	U	72	U	110	U	92
AROCLOR 1254	U	42	U	130	U	150	U	72	U	110	U	92
AROCLOR 1260	U	42	990	130	2300	150	390	72	680	110	830	92
AROCLOR 1268	U	42	3600	130	160000	150	20000	72	76000	110	1400	92

Sample ID	SBLK071495		04478		04479		04480		04481		04482	
Location	-		I-1		I-2		I-3		J-1		J-2	
% Solids	100		30		14		12		16		18	
	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)
AROCLOR 1016	U	42	U	390	U	290	U	340	U	260	U	23
AROCLOR 1221	U	83	U	780	U	590	U	670	U	520	U	46
AROCLOR 1232	U	42	U	390	U	290	U	340	U	260	U	23
AROCLOR 1242	U	42	U	390	U	290	U	340	U	260	U	23
AROCLOR 1248	U	42	U	390	U	290	U	340	U	260	U	23
AROCLOR 1254	U	42	U	390	U	290	U	340	U	260	U	23
AROCLOR 1260	U	42	U	390	U	290	U	340	U	260	U	23
AROCLOR 1268	U	42	110000	390	510000	290	230000	340	300000	260	100000	23

Sample ID	04483		04484		04485		04486		04487		04488	
Location	J-3		K-1		K-2		K-3		L-1		L-2	
% Solids	17		18		14		18		28		18	
	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/k
AROCLOR 1016	U	240	U	230	U	300	U	240	U	150	U	2
AROCLOR 1221	U	480	U	460	U	600	U	480	U	300	U	4
AROCLOR 1232	U	240	U	230	U	300	U	240	U	150	U	2
AROCLOR 1242	U	240	U	230	U	300	U	240	U	150	U	2
AROCLOR 1248	U	240	U	230	U	300	U	240	U	150	U	2
AROCLOR 1254	U	240	U	230	U	300	U	240	U	150	U	2
AROCLOR 1260	U	240	U	230	U	300	U	240	U	150	U	2
AROCLOR 1268	110000	240	79000	230	76000	300	22000	240	49000	150	19000	2

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Table 1.1 (Cont) Results of the Analysis for PCBs in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	A4455		A4456		A4457		A4458		A4459		A4460	
Location	A3		A1		C3		D3		H3		H2	
% Solids	33		20		22		19		18		16	
	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	[illegible]
AROCLOR 1016	U	130	U	210	U	190	U	220	U	280	U	2[illegible]
AROCLOR 1221	U	250	U	420	U	380	U	450	U	530	U	[illegible]
AROCLOR 1232	U	130	U	210	U	190	U	220	U	280	U	2[illegible]
AROCLOR 1242	U	130	U	210	U	190	U	220	U	280	U	280
AROCLOR 1248	U	130	U	210	U	190	U	220	U	280	U	[illegible]
AROCLOR 1254	U	130	U	210	U	190	U	220	U	280	U	[illegible]
AROCLOR 1260	U	130	U	210	U	190	U	220	U	280	U	[illegible]
AROCLOR 1268	53000	130	4000000	210	32000	190	150000	220	250000	280	840000	28[illegible]

Sample ID	A4461		A4462		A4463		A4464		A4465		A4466	
Location	B2		A2		E2		G2		F3		B1	
% Solids	24		32		28		21		19		29	
	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)
AROCLOR 1016	U	180	U	130	U	150	U	200	U	220	U	140
AROCLOR 1221	U	350	U	260	U	290	U	400	U	430	U	290
AROCLOR 1232	U	180	U	130	U	150	U	200	U	220	U	[illegible]
AROCLOR 1242	U	180	U	130	U	150	U	200	U	220	U	[illegible]
AROCLOR 1248	U	180	U	130	U	150	U	200	U	220	U	140
AROCLOR 1254	U	180	U	130	U	150	U	200	U	220	U	140
AROCLOR 1260	U	180	U	130	U	150	U	200	U	220	U	[illegible]
AROCLOR 1268	76000	180	27000	130	230000	150	430000	200	620000	220	180000	[illegible]

Sample ID	A4467		A4468		A4469		A4470		A4471		A4472	
Location	G3		C2		A1		F2		E3		B3	
% Solids	20		16		63		29		22		26	
	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/kg)	Conc. (ug/kg)	MDL (ug/k[illegible]
AROCLOR 1016	U	210	U	250	U	66	U	140	U	190	U	1[illegible]
AROCLOR 1221	U	420	U	510	U	130	U	280	U	390	U	3[illegible]
AROCLOR 1232	U	210	U	250	U	66	U	140	U	190	U	1[illegible]
AROCLOR 1242	U	210	U	250	U	66	U	140	U	190	U	1[illegible]
AROCLOR 1248	U	210	U	250	U	66	U	140	U	190	U	1[illegible]
AROCLOR 1254	U	210	U	250	U	66	U	140	U	190	U	1[illegible]
AROCLOR 1260	U	210	U	250	U	66	U	140	U	190	U	1[illegible]
AROCLOR 1268	160000	210	150000	250	72000	66	3000000	140	3800000	190	80000	1[illegible]

Table 1.1 (Cont) Results of the Analysis for PCBs in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	B 4443		B 4444		B 4445		B 4446		B 4447		B 4448	
Location	66		67		64		61		70		62	
% Solids	29		33		33		29		31		31	
	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg
AROCLOR 1016	U	140	U	130	U	130	U	140	U	130	U	140
AROCLOR 1221	U	290	U	250	U	250	U	280	U	270	U	270
AROCLOR 1232	U	140	U	130	U	130	U	140	U	130	U	140
AROCLOR 1242	U	140	U	130	U	130	U	140	U	130	U	140
AROCLOR 1248	U	140	U	130	U	130	U	140	U	130	U	140
AROCLOR 1254	U	140	U	130	U	130	U	140	U	130	U	140
AROCLOR 1260	3600	140	1700	130	5100	130	11000	140	1700	130	4200	140
AROCLOR 1268	190000	140	11000	130	530000	130	1300000	140	120000	130	230000	140

Sample ID	B 4449		B 4450		B 4451		B 4452		B 4453		B 4454	
Location	63		60		71		68		69		65	
% Solids	29		28		33		31		27		28	
	Conc ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg
AROCLOR 1016	U	140	U	150	U	130	U	130	U	150	U	150
AROCLOR 1221	U	290	U	300	U	250	U	270	U	310	U	300
AROCLOR 1232	U	140	U	150	U	130	U	130	U	150	U	150
AROCLOR 1242	U	140	U	150	U	130	U	130	U	150	U	150
AROCLOR 1248	U	140	U	150	U	130	U	130	U	150	U	150
AROCLOR 1254	U	140	U	150	U	130	U	130	U	150	U	150
AROCLOR 1260	5600	140	8600	150	940	130	5100	130	980	150	5200	150
AROCLOR 1268	170000	140	310000	150	66000	130	330000	130	65000	150	240000	150

Table 1.1 (Cont) Results of the Analysis for PCBs in Soil
WA # 0–113 LCP Chemical Site
(based on dry weight)

Sample ID	SBLK071595		B04347		B04352		B04353		B04354		B04356	
Location	–		82		77		78		75		73	
% Solids	100		16		29		26		27		30	
	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg
AROCLOR 1016	U	42	U	250	U	140	U	160	U	150	U	14
AROCLOR 1221	U	83	U	510	U	280	U	320	U	310	U	[illegible]
AROCLOR 1232	U	42	U	250	U	140	U	160	U	150	U	140
AROCLOR 1242	U	42	U	250	U	140	U	160	U	150	U	140
AROCLOR 1248	U	42	U	250	U	140	U	160	U	150	U	[illegible]
AROCLOR 1254	U	42	U	250	U	140	U	160	U	150	U	[illegible]
AROCLOR 1260	U	42	U	250	U	140	U	160	U	150	U	[illegible]
AROCLOR 1268	U	42	5900	250	27000	140	7500	160	5200	150	20000	140

Sample ID	B04339		SBLK071795		04492		04493		04494		0449[illegible]	
Location	SED–45A		---		N–3		O–1		O–2		O–3	
% Solids	30.3		100.0		23.5		14.9		21.5		17.[illegible]	
	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg
AROCLOR 1016	U	140	U	42	U	170	U	280	U	190	U	240
AROCLOR 1221	U	270	U	83	U	350	U	550	U	380	U	[illegible]
AROCLOR 1232	U	140	U	42	U	170	U	280	U	190	U	[illegible]
AROCLOR 1242	U	140	U	42	U	170	U	280	U	190	U	240
AROCLOR 1248	U	140	U	42	U	170	U	280	U	190	U	240
AROCLOR 1254	U	140	U	42	U	170	U	280	U	190	U	[illegible]
AROCLOR 1260	U	140	U	42	U	170	U	280	U	190	U	[illegible]
AROCLOR 1268	22000	140	U	42	5700	170	7500	280	10000	190	7700	[illegible]

Sample ID	SBLK081095		B04351		04489		04490		04491		044[illegible]	
Location	---		78		L–3		M–1		M–3		P–[illegible]	
% Solids	100.0		32.7		29.6		48.0		20.6		17.6	
	Conc ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg
AROCLOR 1016	U	830	U	2500	U	2800	U	1700	U	4000	U	[illegible]
AROCLOR 1221	U	1700	U	5100	U	5600	U	3500	U	8000	U	830[illegible]
AROCLOR 1232	U	830	U	2500	U	2800	U	1700	U	4000	U	470[illegible]
AROCLOR 1242	U	830	U	2500	U	2800	U	1700	U	4000	U	[illegible]
AROCLOR 1248	U	830	U	2500	U	2800	U	1700	U	4000	U	[illegible]
AROCLOR 1254	U	830	U	2500	U	2800	U	1700	U	4000	U	47[illegible]
AROCLOR 1260	U	830	U	2500	U	2800	U	1700	U	4000	U	47[illegible]
AROCLOR 1268	U	830	12000	2500	12000	2800	7200	1700	21000	4000	19000	[illegible]

Table 1.1 (Cont) Results of the Analysis for PCBs in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	04497		B04346		B04348		B04349		B04350		B04355	
Location	P-2		83		81		80		79		74	
% Solids	20		18		26		25		24		22	
	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg
AROCLOR 1016	U	4100	U	460	U	3200	U	3300	U	3500	U	3800
AROCLOR 1221	U	8300	U	910	U	6400	U	6600	U	7000	U	7600
AROCLOR 1232	U	4100	U	460	U	3200	U	3300	U	3500	U	3800
AROCLOR 1242	U	4100	U	460	U	3200	U	3300	U	3500	U	3800
AROCLOR 1248	U	4100	U	460	U	3200	U	3300	U	3500	U	3800
AROCLOR 1254	U	4100	U	460	U	3200	U	3300	U	3500	U	3800
AROCLOR 1260	U	4100	U	460	U	3200	U	3300	U	3500	U	3800
AROCLOR 1268	21000	4100	2400	460	4800	3200	6400	3300	5100	3500	5800	3800

Sample ID	B04357		B04338		B04340		SBLK08089503		04478	
Location	72		SED-33-34A		SED-44A		---		I-1	
% Solids	31		41		29		100		11	
	Conc ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg
AROCLOR 1016	U	2700	U	200	U	2800	U	2500	U	24000
AROCLOR 1221	U	5300	U	400	U	5700	U	5000	U	47000
AROCLOR 1232	U	2700	U	200	U	2800	U	2500	U	24000
AROCLOR 1242	U	2700	U	200	U	2800	U	2500	U	24000
AROCLOR 1248	U	2700	U	200	U	2800	U	2500	U	24000
AROCLOR 1254	U	2700	U	200	U	2800	U	2500	U	24000
AROCLOR 1260	U	2700	U	200	U	2800	U	2500	U	24000
AROCLOR 1268	14000	2700	1600	200	3900	2800	U	2500	380000	24000

Table 1.2 Results of the Analysis for Aroclor 1268 in Whole Body Killifish
WA # 0113 LCP Chemical Site
(based on dry weight)

Change on methyl Hg

Sample Location	Sample Number	Aroclor 1268 (mg/kg)	MDL (mg/kg)	Percent Lipid	Percent Solid
LCP 43	A04342	4.15	0.090	9.3	26
LCP 43	A04341	3.75	0.079	10.2	28
LCP 43	A2363	2.80	0.11	5.6	24
LCP 43	A2364	4.97	0.093	6.8	25
LCP 43	A2365	4.05	0.095	7.6	21
LCP 43	A2366	3.44	0.083	8.1	24
LCP 43	A2367	3.46	0.083	8.2	23
LCP 43	A2368	4.04	0.086	6.3	23
LCP 43	A2369	3.43	0.076	10.2	25
Confluence	A04473	7.97	0.077	6.6	25
Confluence	A04474	24.82	0.141	9.1	26
Confluence	A04475	13.7	0.094	7.2	26
Confluence	A04476	6.51	0.102	3.9	25
Confluence	A04477	12.38	0.075	7.0	25
Confluence	A04343	26.3	0.07	4.5	24
Confluence	A04344	321.58	0.10	8.4	27
Outfall	A04363	19.89	0.079	9.2	26
Outfall	A04364	222.35	0.10	6.6	25
Outfall	A04365	202.10	0.11	5.6	24
Outfall	A04366	87.58	0.11	6.7	21
Outfall	A04367	135.84	0.12	6.4	25
Reference	A 2359	0.14	0.095	8.3	23
Reference	A 2360	0.086 J	0.10	5.7	24
Reference	A 2361	0.053 J	0.12	5.8	23
Reference	A 2362	0.15	0.12	6.3	23
Reference	A 3878	0.20	0.11	9.3	23
Reference	A 3879	0.087 J	0.098	5.7	22
Reference	A 3880	0.12	0.086	7.2	23

Table 1.3 Results of the Analysis for Aroclor 1268 in Clapper Rails
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample Location	Sample Number	Matrix	Aroclor 1268 (mg/kg)	MDL (mg/kg)	Percent Lipid	Percent Solid
Rail #1	A 04499	Breast Muscle	7.95	0.079	6.6	24
Rail #1	A 04345	Carcass	21.43	0.062	17.2	30
Rail #1	A 04498	Liver	31.23	0.076	19.8	29
Rail #2	A 04361	Breast Muscle	12.22	0.11	6.6	24
Rail #2	A 04500	Carcass	50.63	0.064	15.7	29
Rail #2	A 04359	Liver	35.5	0.16	18.8	27
Rail #3	A 03863	Breast Muscle	6.37	0.11	10.4	26
Rail #3	A 03862	Carcass	21.49	0.059	25.5	34
Rail #3	A 03865	Liver	18.51	1.06	19.3	29
Rail #1	NB 9501 F	Breast Muscle	6.25	0.09	3.2	25
Rail #1	NB 9501 D	Carcass	18.36	0.07	9.1	28
Rail #1	NB 9501 B	Liver	28.55	0.11	16.4	26
Rail #2	NB 9502 F	Breast Muscle	19.42	0.11	12.4	23
Rail #2	NB 9502 D	Carcass	23.64	0.06	15.1	30
Rail #2	NB 9502 A	Liver	25.46	0.10	20.8	28
Rail #3	SM 9501 F	Breast Muscle	6.92	0.09	3.8	25
Rail #3	SM 9501 D	Carcass	44.71	0.07	18.2	30
Rail #3	SM 9501 A	Liver	25.96	0.17	17.4	28
Rail #4	SM 9502 F	Breast Muscle	5.34	0.10	5.8	25
Rail #4	SM 9502 D	Carcass	14.48	0.06	14.6	29
Rail #4	SM 9502 B	Liver	9.47	0.10	15.8	27
Rail #8 - LCPTC9503	A04880	Breast Muscle	0.33	0.12	9	24
Rail #8 - LCPTC9503	A03994	Carcass	0.53	0.06	15	31
Rail #8 - LCPTC9503	A04882	Liver	0.28	0.14	13	28
Rail #9 - LCPTC9506	A04887	Breast Muscle	0.34	0.09	7	25
Rail #9 - LCPTC9506	A03991	Carcass	0.77	0.07	15	29
Rail #9 - LCPTC9506	A04886	Liver	0.42	0.09	13	27
Rail #10 - LCPTC9504	A04885	Breast Muscle	0.27	0.10	4	23
Rail #10 - LCPTC9504	A03990	Carcass	0.62	0.06	12	31
Rail #10 - LCPTC9504	A04883	Liver	0.42	0.09	12	28
Rail #11 - LCPTC9505	A03998	Breast Muscle	3.95	0.10	12	25
Rail #11 - LCPTC9505	A03989	Carcass	8.79	0.06	23	33
Rail #11 - LCPTC9505	A03997	Liver	3.23	0.10	15	25
Rail #12 - LCPTC9501	A04897	Breast Muscle	0.43	0.08	11	27
Rail #12 - LCPTC9501	A03996	Carcass	0.97	0.06	26	34
Rail #12 - LCPTC9501	A04896	Liver	0.57	0.09	14	28
Rail #13 - LCPTC9502	A04894	Breast Muscle	0.19	0.14	3	22
Rail #13 - LCPTC9502	A03995	Carcass	0.40	0.06	8	30
Rail #13 - LCPTC9502	A04893	Liver	0.44	0.09	12	27
Rail #14 - LCPTC9507	A04891	Breast Muscle	0.30	0.08	5	26
Rail #14 - LCPTC9507	A03993	Carcass	0.86	0.06	20	32
Rail #14 - LCPTC9507	A04889	Liver	0.58	0.12	13	23

Table 1.4 Results of the Analysis for Aroclor 1268 in Spot
(Edible Fillet)
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample Location	Sample Number	Aroclor 1268 (mg/kg)	MDL (mg/kg)	Percent Lipid	Percent Solid
Purvis Creek – DS	4403	0.85	0.089	2.3	22
Purvis Creek – DS	4405	1.06	0.091	3.2	22
Purvis Creek – DS	4406	0.85	0.090	2.8	22
Purvis Creek – DS	4408	3.24	0.086	3.1	22
Purvis Creek – DS	4410	1.25	0.094	3.2	21
Purvis Creek – DS	4412	1.44	0.24	2.8	21
Purvis Creek – DS	4414	0.70	0.089	2.5	22
Purvis Creek – US	4417	3.04	0.11	3.2	22
Purvis Creek – US	4419	2.80	0.11	2.6	20
Purvis Creek – US	4421	2.84	0.12	2.4	20
Purvis Creek – US	4423	4.18	0.12	3.0	20
Purvis Creek – US	4425	1.81	0.11	3.1	21
Purvis Creek – US	4427	1.96	0.12	2.3	21
Purvis Creek – US	4429	2.83	0.097	2.3	21
Turtle River	4431	1.19	0.13	2.3	19
Turtle River	4433	1.15	0.13	3.1	20
Turtle River	4435	1.18	0.13	2.3	20
Turtle River	4437	1.12	0.13	2.5	20

Table 1.5 Results of the Analysis for Aroclor 1268 in Diamond Back Terrapins
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample Location	Sample Number	Matrix	Aroclor 1268 (mg/kg)	MDL (mg/kg)	Percent Lipid	Percent Solid
HD-1	04714	Hatchling	11.87	0.14	24.9	30
HD-2	04715	Hatchling	13.22	0.11	27.2	33
HD-3	04716	Hatchling	14.37	0.11	28.6	35
HD-4	04717	Hatchling	9.94	0.10	26.5	30
HD-5	04718	Hatchling	13.60	0.10	25.8	28
BD-1	04701	Carcass	14.50	0.08	5.2	23
BD-1	04702	Liver	58.46	0.06	20.7	29
BE-1	04703	Egg from BD-1	27.38	0.13	22.5	36
BE-2	04704	Egg from BD-1	38.52	0.06	28.1	38
BE-3	04705	Egg from BD-1	26.87	0.06	24.7	38
BE-4	04706	Egg from BD-1	31.01	0.06	26.0	41
BE-5	04707	Egg from BD-1	27.89	0.07	27.2	34
BE-6	04708	Egg from BD-1	28.99	0.08	24.4	36
BE-7	04709	Egg from BD-1	27.78	0.08	26.5	36
NTD-1	04710	Liver	20.73	0.06	35.2	33
NTD-1	04711	Carcass	8.16	0.09	12.3	22
NTD-2	04712	Liver	45.01	0.06	26.7	35
NTD-3	04713	Carcass	36.36	0.08	17.0	24
Pit Area	A04362	Broken egg shells	0.51	0.054	0.1	90
DD-4	A00553	Egg from DD-4 (unhatched)	30.72	0.10		83
DD-4	A00554	Egg from DD-4 (unhatched)	26.24	0.08		75
DD-4	A00555	Egg from DD-4 (unhatched)	32.37	0.08		74
DD-4	A00556	Egg from DD-4 (unhatched)	19.16	0.08		67
DD-4	A00557	Egg from DD-4 (unhatched)	35.13	0.11		74

Table 1.8 Results of the Analysis for Aroclor 1268 in Spartina Grass
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample Location	Sample Number	Aroclor 1268 (mg/kg)	MDL (mg/kg)	Percent Lipid	Percent Solid
Reference	A 04034	0.006 J	0.05	2.6	42
Reference	A 04035	U	0.06	3.1	42
Reference	A 04036	U	0.05	2.5	41
17−18	A 04037	0.25	0.06	2.6	34
17−18	A 04038	0.26	0.06	2.8	34
17−18	A 04039	0.55	0.06	2.7	34
M−1	A 04040	3.28	0.05	3.0	41
M−1	A 04041	2.63	0.05	3.0	38
M−1	A 04042	2.41	0.04	2.8	43

Table 1.7 Results of the Analyses for Aroclor 1268 in Grasshoppers
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample Location	Sample Number	Aroclor 1268 (mg/kg)	MDL (mg/kg)	Percent Lipid	Percent Solid
M-1	A 04032	0.76	0.10	13.0	31
M-2	A 04033	0.52	0.08	12.4	32

Table 1.8 Results of the Analysis for PCBs in Blanks for Tissue Samples
WA # 0-113 LCP Chemical Site

Sample ID Location % Solids	Method Blank 071295 TL 100		Method Blank 071595 TL 100		Method Blank 071795 TL 100		Method Blank 071895 TL 100		Method Blank 072495 TL 100		Method Blank 080195 TL 1[illegible]	
	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	M[illegible] [illegible]
AROCLOR 1016	U	20	U	20	U	20	U	20	U	20	U	[illegible]
AROCLOR 1221	U	40	U	40	U	40	U	40	U	40	U	[illegible]
AROCLOR 1232	U	20	U	20	U	20	U	20	U	20	U	[illegible]
AROCLOR 1242	U	20	U	20	U	20	U	20	U	20	U	20
AROCLOR 1248	U	20	U	20	U	20	U	20	U	20	U	[illegible]
AROCLOR 1254	U	20	U	20	U	20	U	20	U	20	U	[illegible]
AROCLOR 1260	U	20	U	20	U	20	U	20	U	20	U	[illegible]
AROCLOR 1268	12 J	20	U	20	1 J	20	U	20	U	20	U	2[illegible]

Sample ID Location % Solids	Method Blank 082195 100		Method Blank 082895 100		Method Blank 092295 100	
	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg	Conc. ug/kg	MDL ug/kg
AROCLOR 1016	U	20	U	20	U	20
AROCLOR 1221	U	40	U	40	U	40
AROCLOR 1232	U	20	U	20	U	20
AROCLOR 1242	U	20	U	20	U	20
AROCLOR 1248	U	20	U	20	U	20
AROCLOR 1254	U	20	U	20	U	20
AROCLOR 1260	U	20	U	20	U	20
AROCLOR 1268	U	20	U	20	U	20

Table 1.9 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 072495 TL

Samples Extracted	Matrix
NB 9501 D	Clapper Rail
NB 9501 D MS	Clapper Rail
NB 9501 D MSD	Clapper Rail
NB 9501 F	Clapper Rail
NB 9501 B	Clapper Rail
NB 9502 D	Clapper Rail
NB 9502 F	Clapper Rail
NB 9502 A	Clapper Rail
SM 9501 D	Clapper Rail
SM 9501 F	Clapper Rail
SM 9501 A	Clapper Rail
SM 9502 D	Clapper Rail
SM 9502 F	Clapper Rail
SM 9502 B	Clapper Rail

Table 1.9 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues WA # 0-113 LCP Chemical Site

Method Blank 080195 TL

Samples Extracted	Matrix
A 04345 Reextract	Clapper Rail

Table 1.9 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues WA # 0-113 LCP Chemical Site

5 12 0095

Method Blank 071795 TL

Samples Extracted	Matrix
3878 A	Killifish
3879 A	Killifish
3880 A	Killifish
2359 A	Killifish
2360 A	Killifish
2361 A	Killifish
2362 A	Killifish
2363 A	Killifish
2364 A	Killifish
2365 A	Killifish
2366 A	Killifish
2367 A	Killifish
2368 A	Killifish
2369 A	Killifish
A 03862	Clapper Rail
A 03862 MS	Clapper Rail
A 03862 MSD	Clapper Rail
A 03863	Clapper Rail
A 03865	Clapper Rail
A 04345 MS	Clapper Rail
A 04345 MSD	Clapper Rail
A 04362 MS	Clapper Rail
A 04362 MSD	Clapper Rail

Table 1.9 (Cont) Correlation of Samples
and Blanks for Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 071995 TL

Samples Extracted	Matrix
04701	Diamond Back Terrapin
04701 MS	Diamond Back Terrapin
04701 MSD	Diamond Back Terrapin
04702	Diamond Back Terrapin
04703	Diamond Back Terrapin
04704	Diamond Back Terrapin
04705	Diamond Back Terrapin
04706	Diamond Back Terrapin
04707	Diamond Back Terrapin
04708	Diamond Back Terrapin
04709	Diamond Back Terrapin
04710	Diamond Back Terrapin
04711	Diamond Back Terrapin
04711 MS	Diamond Back Terrapin
04711 MSD	Diamond Back Terrapin
04712	Diamond Back Terrapin
04713	Diamond Back Terrapin
04714	Diamond Back Terrapin
04715	Diamond Back Terrapin
04716	Diamond Back Terrapin
04717	Diamond Back Terrapin
04718	Diamond Back Terrapin

Table 1.9 Correlation of Samples and Blanks for
Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

3 12 091

Method Blank 071295 TL

Samples Extracted	Matrix
4403	Spot
4405	Spot
4406	Spot
4408	Spot
4410	Spot
4412	Spot
4412 MS	Spot
4412 MSD	Spot
4414	Spot
4417	Spot
4419	Spot
4421	Spot
4423	Spot
4425	Spot
4427	Spot
4429	Spot
4431	Spot
4433	Spot
4435	Spot
4437	Spot

Table 1.9 (Cont) Correlation of Samples
and Blanks for Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 071595 TL

Samples Extracted	Matrix
A 04342	Killfish
A 04341	Killfish
A 04473	Killfish
A 04474	Killfish
A 04474 MS	Killfish
A 04474 MSD	Killfish
A 04475	Killfish
A 04476	Killfish
A 04477	Killfish
A 04343	Killfish
A 04344	Killfish
A 04363	Killfish
A 04364	Killfish
A 04365	Killfish
A 04366	Killfish
A 04367	Killfish
A 04499	Clapper Rail
A 04361	Clapper Rail
A 04498	Clapper Rail
A 04459	Clapper Rail
A 04345	Clapper Rail
A 04500	Clapper Rail
A 04362	Clapper Rail

Table 1.9 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissues WA # 0-113 LCP Chemical Site

Method Blank 082195

Samples Extracted	Matrix
A04882	Clapper Rail
A04880	Clapper Rail
A03990	Clapper Rail
A03991	Clapper Rail
A04885	Clapper Rail
A04887	Clapper Rail
A04883	Clapper Rail
A03994	Clapper Rail
A04886	Clapper Rail
A04891	Clapper Rail
A04889	Clapper Rail
A03993	Clapper Rail
A03998	Clapper Rail
A04897	Clapper Rail
A03996	Clapper Rail
A04896	Clapper Rail
A03997	Clapper Rail
A03995	Clapper Rail
A04894	Clapper Rail
A03989	Clapper Rail
A04893	Clapper Rail
A03994 MS	Clapper Rail
A03994 MSD	Clapper Rail

Table 1.9 (Cont) Correlation of Samples
and Blanks for Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

Method Blank 082895

Samples Extracted	Matrix
A00553	Diamond Back Terrapin
A00554	Diamond Back Terrapin
A00555	Diamond Back Terrapin
A00556	Diamond Back Terrapin
A00557	Diamond Back Terrapin

Table 1.9 (Cont) Correlation of Samples
and Blanks for Aroclor 1268 in Tissues
WA # 0-113 LCP Chemical Site

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Method Blank 092295

Samples Extracted	Matrix
04034	Spartina Grass
04034 MS	Spartina Grass
04034 MSD	Spartina Grass
04035	Spartina Grass
04036	Spartina Grass
04037	Spartina Grass
04038	Spartina Grass
04039	Spartina Grass
04040	Spartina Grass
04041	Spartina Grass
04042	Spartina Grass
04032	Grasshoppers
04033	Grasshoppers

Table 1.10 Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID		Method Blank		B4438		B4439		B4440		B4441		B4442	
Location		Lab		41A		52		53		54		55	
Parameter	Analysis Method	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	M mg
Aluminum	ICAP	U	10	37000	20	38000	21	22000	5.9	31000	15	17000	8.9
Antimony	ICAP	U	6.0	U	12	U	12	U	3.6	U	9.1	U	5.3
Arsenic	AA-Fur	U	0.50	8.6	1.5	11	2.0	4.6	0.77	8.4	1.5	5.6	1.1
Barium	ICAP	U	4.0	37	8.0	40	8.2	21	2.4	32	6.0	39	3.5
Beryllium	ICAP	U	0.20	1.8	0.40	1.7	0.40	0.64	0.10	1.5	0.30	0.82	0.20
Cadmium	ICAP	U	0.30	U	0.60	U	0.60	U	0.20	U	0.50	U	0.30
Calcium	ICAP	U	50	4400	100	3500	100	1900	30	3300	76	36000	44
Chromium	ICAP	U	0.80	79	1.6	130	1.6	49	0.50	62	1.2	24	0.70
Cobalt	ICAP	U	2.0	9.4	4.0	9.8	4.1	3.7	1.2	8.1	3.0	4.4	1.8
Copper	ICAP	U	0.60	14	1.2	19	1.2	6.4	0.40	15	0.9	9.5	0.50
Iron	ICAP	9.3	9.0	33000	18	32000	19	20000	5.3	27000	14	15000	8.0
Lead	ICAP	U	4.0	52	8.0	39	8.2	26	2.4	30	6.0	20	3.5
Magnesium	ICAP	U	50	8000	100	8100	100	4000	30	6600	76	3700	44
Manganese	ICAP	U	1.4	350	2.8	330	2.9	160	0.80	330	2.1	280	1.2
Mercury	Cold Vapor	U	0.04	1.9	0.08	49	1.8	5.3	0.22	5.9	0.30	0.13	0.04
Nickel	ICAP	U	2.0	16	4.0	20	4.1	6	1.2	15	3.0	10	1.6
Potassium	ICAP	U	200	4200	400	4000	410	2300	120	3600	300	1800	180
Selenium	AA-Fur	U	0.50	U	1.5	U	2.0	U	0.77	U	1.5	U	1.
Silver	ICAP	U	0.50	U	1.0	U	1.0	U	0.30	U	0.80	U	0.4
Sodium	ICAP	U	50	17000	100	19000	100	10000	30	15000	76	9700	4
Thallium	AA-Fur	U	0.50	U	0.74	U	0.98	U	0.39	U	0.75	U	1.1
Vanadium	ICAP	U	2.0	78	4.0	78	4.1	45	1.2	71	3.0	33	1.8
Zinc	ICAP	2.5	2.0	71	4.0	92	4.1	36	1.2	68	3.0	110	1.

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Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID		B4443		B4444		B4445		B4446		B4447		B4448	
Location		66		67		64		61		70		62	
Parameter	Analysis Method	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	ICAP	30000	17	25000	14	36000	17	33000	19	33000	18	28000	16
Antimony	ICAP	U	10	U	8.1	U	10	U	12	U	11	U	9.8
Arsenic	AA-Fur	9.1	1.5	11	1.4	8.8	1.2	7.5	1.3	7.4	1.3	9.1	1.6
Barium	ICAP	33	6.7	25	5.4	69	6.9	36	7.7	40	7.0	34	6.5
Beryllium	ICAP	1.5	0.30	1.7	0.30	1.8	0.30	1.7	0.40	2	0.40	1.5	0.30
Cadmium	ICAP	U	0.50	U	0.40	U	0.50	U	0.60	U	0.50	U	0.50
Calcium	ICAP	3500	84	2100	68	2900	87	3500	96	6600	88	10000	82
Chromium	ICAP	110	1.3	45	1.1	64	1.4	61	1.5	160	1.4	61	1.3
Cobalt	ICAP	10	3.3	9.4	2.7	9.3	3.5	8.2	3.8	11	3.5	9.0	3.3
Copper	ICAP	22	1.0	6.8	0.80	22	1.0	29	1.2	24	1.1	21	1.0
Iron	ICAP	28000	15	31000	12	32000	16	30000	17	36000	16	31000	15
Lead	ICAP	46	6.7	20	5.4	60	6.9	87	7.7	53	7.0	51	6.5
Magnesium	ICAP	7300	84	6800	68	7400	87	6400	96	9800	88	7400	82
Manganese	ICAP	320	2.3	220	1.9	300	2.4	310	2.7	500	2.5	460	2.3
Mercury	Cold Vapor	55	1.5	1.3	0.07	81	1.5	98	3.7	25	1.7	150	3.6
Nickel	ICAP	15	3.3	13	2.7	19	3.5	19	3.8	19	3.5	17	3.3
Potassium	ICAP	3700	330	3900	270	4000	350	3700	380	4800	350	3700	330
Selenium	AA-Fur	U	1.5	U	1.4	U	1.2	U	1.3	U	1.3	U	1.6
Silver	ICAP	U	0.80	U	0.70	U	0.90	U	1.0	U	0.90	U	0.80
Sodium	ICAP	18000	84	16000	68	16000	87	20000	96	21000	88	17000	82
Thallium	AA-Fur	U	0.73	U	0.71	U	0.59	U	0.65	U	0.66	U	1.6
Vanadium	ICAP	65	3.3	60	2.7	85	3.5	78	3.8	79	3.5	67	3.3
Zinc	ICAP	79	3.3	39	2.7	85	3.5	91	3.8	110	3.5	77	3.3

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID		B4449		B4450		B4451		B4452		B4453		B4454	
Location		63		60		71		68		69		65	
Parameter	Analysis Method	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MD' mg/
Aluminum	ICAP	27000	19	23000	13	38000	14	39000	19	21000	16	35000	16
Antimony	ICAP	U	12	U	8.1	U	8.3	U	12	U	9.7	U	9.7
Arsenic	AA-Fur	8.7	2.0	7.1	1.3	9.1	1.3	10	2.0	10	2.0	8.2	1.7
Barium	ICAP	34	7.7	53	5.4	36	5.6	45	7.8	28	6.5	39	6.4
Beryllium	ICAP	1.4	0.40	1.4	0.30	1.8	0.30	1.8	0.40	1.5	0.30	1.7	0.30
Cadmium	ICAP	U	0.80	U	0.40	U	0.40	U	0.80	U	0.50	U	0.50
Calcium	ICAP	2800	97	2700	67	3600	69	3300	97	4900	81	3100	80
Chromium	ICAP	130	1.5	65	1.1	52	1.1	77	1.8	160	1.3	110	1.3
Cobalt	ICAP	14	3.9	7	2.7	8.9	2.8	9.5	3.9	7.8	3.2	11	3.2
Copper	ICAP	23	1.2	20	0.80	15	0.80	19	1.2	17	1.0	29	1.0
Iron	ICAP	24000	17	28000	12	32000	12	31000	18	28000	15	31000	14
Lead	ICAP	44	7.7	130	5.4	28	5.6	48	7.8	39	6.5	57	6.4
Magnesium	ICAP	7100	97	6500	67	7200	69	7700	97	7200	81	8000	80
Manganese	ICAP	250	2.7	310	1.9	340	1.9	440	2.7	380	2.3	330	2.3
Mercury	Cold Vapor	65	3.8	65	3.8	30	1.1	27	1.5	22	0.88	82	3.3
Nickel	ICAP	16	3.9	14	2.7	15	2.8	19	3.9	13	3.2	18	3.2
Potassium	ICAP	3500	390	3300	270	3700	280	4200	390	3500	320	4000	320
Selenium	AA-Fur	U	2.0	U	1.3	U	1.3	U	2.0	U	2.0	U	1.7
Silver	ICAP	U	1.0	U	0.70	U	0.70	U	1.0	U	0.80	U	0.80
Sodium	ICAP	19000	97	18000	67	16000	69	15000	97	14000	81	20000	80
Thallium	AA-Fur	U	0.99	U	0.86	U	0.85	U	1.0	U	1.0	U	0.85
Vanadium	ICAP	65	3.9	65	2.7	68	2.8	85	3.9	61	3.2	73	3.2
Zinc	ICAP	86	3.9	77	2.7	62	2.8	67	3.9	67	3.2	91	3.2

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Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID		Method Blank		C04478		D04479		C04480		C04481		C04482	
Location		Lab		I-1		I-2		I-3		J-1		J-2	
Parameter	Analysis Method	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	ICAP	U	10	23000	70	22000	50	18000	64	17000	48	22000	32
Antimony	ICAP	U	6.0	U	42	U	30	U	38	U	29	U	19
Arsenic	AA-Fur	U	0.50	5.0	3.1	4.3	2.7	4.5	3.2	5.1	2.3	5.9	2.0
Barium	ICAP	U	4.0	31	28	28	20	U	26	23	19	25	13
Beryllium	ICAP	U	0.20	U	1.4	1.2	1.0	U	1.3	U	1.0	1.1	0.6
Cadmium	ICAP	U	0.30	U	2.1	U	1.5	U	1.9	U	1.4	U	1.0
Calcium	ICAP	U	50	5200	350	6900	250	3700	320	7800	240	3600	160
Chromium	ICAP	U	0.80	84	5.6	80	4.0	96	5.1	94	3.8	110	2.6
Cobalt	ICAP	U	2.0	U	14	U	10	U	13	9.6	9.5	U	6.5
Copper	ICAP	U	0.60	57	4.2	45	3.0	32	3.8	73	2.9	39	1.9
Iron	ICAP	U	9.0	19000	63	20000	45	17000	58	15000	43	17000	29
Lead	ICAP	U	4.0	250	28	150	20	110	26	230	19	84	13
Magnesium	ICAP	U	50	9700	350	9100	250	9300	320	9300	240	8600	160
Manganese	ICAP	U	1.4	170	9.9	160	7.0	130	9.0	120	6.7	84	4.5
Mercury	Cold Vapor	U	0.04	370	13	290	3.8	130	6.3	310	2.7	150	3.5
Nickel	ICAP	U	2.0	31	14	26	10	17	13	21	9.5	17	6.5
Potassium	ICAP	U	200	3600	1400	3700	1000	3600	1300	3400	950	3800	650
Selenium	AA-Fur	U	0.50	U	3.1	U	2.7	U	3.2	U	2.3	U	2.0
Silver	ICAP	U	0.50	U	3.5	U	2.5	U	3.2	U	2.4	U	1.6
Sodium	ICAP	U	50	43000	350	39000	250	46000	320	46000	240	36000	160
Thallium	AA-Fur	U	0.50	U	3.1	U	2.7	U	3.2	U	2.3	U	2.0
Vanadium	ICAP	U	2.0	120	14	90	10	80	13	67	9.5	75	6.5
Zinc	ICAP	2.0	2.0	200	14	140	10	120	13	180	9.5	100	6.5

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID		C04483		C04484		C04485		C04486		C04487		C04488	
Location		J-3		K-1		K-2		K-3		L-1		L-2	
Parameter	Analysis Method	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	ICAP	18000	35	13000	31	13000	41	18000	43	11000	26	17000	43
Antimony	ICAP	U	21	U	19	U	25	U	26	U	16	U	26
Arsenic	AA-Fur	6.2	2.2	2.9	1.8	5.5	2.3	5.4	1.9	3.8	1.3	6.5	2.0
Barium	ICAP	21	14	100	12	19	17	23	17	36	10	27	17
Beryllium	ICAP	1.1	0.70	0.8	0.60	0.87	0.80	1.1	0.90	0.77	0.50	0.99	0.90
Cadmium	ICAP	U	1.0	U	0.90	U	1.2	U	1.3	U	0.80	U	1.3
Calcium	ICAP	3400	170	26000	160	3700	210	3400	210	3800	130	4200	210
Chromium	ICAP	130	2.8	58	2.5	110	3.3	130	3.4	77	2.1	100	3.4
Cobalt	ICAP	7.4	6.9	6.6	6.2	U	8.3	U	8.5	U	5.2	U	8.5
Copper	ICAP	27	2.1	44	1.9	29	2.5	24	2.6	28	1.6	27	2.6
Iron	ICAP	16000	31	12000	28	12000	37	15000	38	8900	23	13000	38
Lead	ICAP	58	14	310	12	68	17	52	17	120	10	53	17
Magnesium	ICAP	8400	170	13000	160	8600	210	8200	210	6200	130	8100	210
Manganese	ICAP	110	4.8	220	4.3	74	5.8	130	6.0	190	3.8	92	6.0
Mercury	Cold Vapor	120	5.3	110	4.4	93	5.6	58	3.3	86	1.9	64	0.91
Nickel	ICAP	14	6.9	17	6.2	14	8.3	14	8.5	11	5.2	14	8.5
Potassium	ICAP	3800	690	1900	620	3800	830	3800	850	2800	520	3500	850
Selenium	AA-Fur	U	2.2	U	1.8	U	2.3	U	1.9	U	1.3	U	2.0
Silver	ICAP	U	1.7	U	1.6	U	2.1	U	2.1	U	1.3	U	2.1
Sodium	ICAP	35000	170	49000	160	44000	210	35000	210	22000	130	35000	210
Thallium	AA-Fur	U	2.2	U	1.8	U	2.3	U	1.9	U	1.3	U	2.0
Vanadium	ICAP	67	6.9	70	6.2	66	8.3	66	8.5	43	5.2	65	8.5
Zinc	ICAP	84	6.9	93	6.2	88	8.3	74	8.5	64	5.2	79	8.5

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID		C04489		C04490		C04491		C04492		C04493		C04494	
Location		L-3		M-1		M-3		N-3		O-1		O-2	
Parameter	Analysis Method	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	ICAP	7700	25	800	9.4	20000	26	21000	30	12000	45	19000	25
Antimony	ICAP	U	15	U	5.6	U	16	U	18	U	27	U	15
Arsenic	AA-Fur	3.9	1.2	1.4	0.80	6.4	1.7	6.3	1.7	5.3	2.2	6.0	1.9
Barium	ICAP	12	9.9	U	3.8	26	11	28	12	21	18	35	10
Beryllium	ICAP	0.53	0.50	U	0.20	1.3	0.50	1.3	0.60	U	0.90	1.3	0.50
Cadmium	ICAP	U	0.70	U	0.30	U	0.80	U	0.90	U	1.3	U	0.80
Calcium	ICAP	2000	120	540	47	3000	130	3100	150	5200	220	3500	130
Chromium	ICAP	55	2.0	4.4	0.80	120	2.1	130	2.4	70	3.6	110	2.0
Cobalt	ICAP	U	5.0	U	1.9	7.1	5.3	6.1	6.0	U	8.9	6.1	5.1
Copper	ICAP	9	1.5	1.6	0.60	22	1.6	20	1.8	14	2.7	23	1.5
Iron	ICAP	6300	22	640	8.4	21000	24	19000	27	5800	40	15000	23
Lead	ICAP	75	9.9	19	3.8	36	11	33	12	56	18	37	10
Magnesium	ICAP	4300	120	800	47	7700	130	7600	150	9300	220	7800	130
Manganese	ICAP	170	3.5	7.5	1.3	200	3.7	210	4.2	50	6.3	190	3.6
Mercury	Cold Vapor	19	0.56	5.9	0.08	38	0.84	36	0.61	48	1.1	56	0.68
Nickel	ICAP	5.6	5.0	U	1.9	12	5.3	12	6.0	11	8.9	12	5.1
Potassium	ICAP	1800	500	310	190	3800	530	3600	600	3200	890	3500	510
Selenium	AA-Fur	U	1.2	U	0.80	U	1.7	U	1.7	U	2.2	U	1.9
Silver	ICAP	U	1.2	U	0.50	U	1.3	U	1.5	U	2.2	U	1.3
Sodium	ICAP	18000	120	6900	47	28000	130	25000	150	46000	220	28000	130
Thallium	AA-Fur	U	1.2	U	0.80	U	1.7	U	1.7	U	2.2	U	1.9
Vanadium	ICAP	36	5.0	6.3	1.9	66	5.3	70	6.0	57	8.9	64	5.1
Zinc	ICAP	31	5.0	6.7	1.9	74	5.3	71	6.0	44	8.9	61	5.1

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID		C04495		C04496		C04497	
Location		O-3		P-1		P-2	
Parameter	Analysis Method	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	ICAP	18000	40	18000	33	20000	27
Antimony	ICAP	U	24	U	20	U	16
Arsenic	AA-Fur	6.1	2.0	3.4	1.1	6.1	2.0
Barium	ICAP	22	16	930	13	27	11
Beryllium	ICAP	1.1	0.80	0.82	0.70	1.3	0.50
Cadmium	ICAP	U	1.2	U	1.0	U	0.80
Calcium	ICAP	3400	200	5000	170	3400	130
Chromium	ICAP	130	3.2	63	2.7	120	2.1
Cobalt	ICAP	U	8.0	U	6.6	7.6	5.3
Copper	ICAP	19	2.4	17	2.0	24	1.6
Iron	ICAP	17000	36	9300	30	19000	24
Lead	ICAP	28	16	43	13	35	11
Magnesium	ICAP	8400	200	7500	170	8000	130
Manganese	ICAP	120	5.6	75	4.7	210	3.7
Mercury	Cold Vapor	33	0.95	43	0.85	50	0.75
Nickel	ICAP	13	8.0	15	6.6	13	5.3
Potassium	ICAP	3900	800	2900	660	3600	530
Selenium	AA-Fur	U	2.0	1.8	1.1	U	2.0
Silver	ICAP	U	2.0	U	1.7	U	1.3
Sodium	ICAP	36000	200	30000	170	29000	130
Thallium	AA-Fur	U	2.0	U	1.1	U	2.0
Vanadium	ICAP	68	8.0	82	6.6	63	5.3
Zinc	ICAP	67	8.0	57	6.6	71	5.3

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Table 1.11 Results of the Analysis for Mercury in Extracts
WA # 0–113 LCP Chemical Site

Client ID	Location	Mercury Conc ug/L	Mercury MDL ug/L
Method Blank	–	U	0.20
Method Blank	–	U	0.20
03872	F–2	4.7	2.0
03873–1	C–3	2.3	2.0
03874–3	19–20	250	20
03875	17–18	6.6	2.0
03876–6	M–1	U	4.0
03877–7	36	110	4.0
03876–5	M–1	U	4.0
03874–4	19–20	260	20
03873–2	C–3	3.0	2.0
03877–8	36	57	4.0

Table 1.12 Results of the Analysis for Mercury in Sediment
WA # 0–113 LCP Chemical Site
Based on Dry Weight

Sample ID	Location	Mercury Conc mg/kg	Mercury MDL mg/kg
Method Blank	–	U	0.03
A4455	A3	76	2.9
A4456	H1	960	35
A4457	C3	65	5.3
A4458	D3	170	5.4
A4459	H3	210	5.4
A4460	H2	480	12
A4461	B2	140	5.3
A4462	A2	81	3.2
A4463	E2	200	4.4
A4464	D2	430	12
A4465	F3	300	11
A4466	B1	88	4.4
A4467	G3	230	5.4
A4468	C2	200	5.9
A4469	A1	18	1.8
A4470	F2	580	17
A4471	E3	280	9.6
A4472	B3	32	1.8

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Table 1.12 (Cont) Results of the Analysis for Mercury in Sediment
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Location	Mercury Conc mg/kg	Mercury MDL mg/kg
Method Blank	-	U	0.04
B04346	83	12	0.18
B04347	82	39	1.2
B04348	81	7.6	0.09
B04349	80	20	0.68
B04350	79	7.7	0.14
B04351	78	4.0	0.12
B04352	77	55	0.65
B04353	76	17	0.63
B04354	75	29	0.62
B04355	74	23	0.68
B04356	73	4.6	0.06
B04357	72	8.8	0.12
B04338	SED-33-34A	0.70	0.06
B04339	SED-45A	5.1	0.08
B04340	SED-44A	20	0.63

Table 1.13 Results of the Analysis for Mercury in Whole Body Killifish
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Sample Location	Mercury Conc ug/kg	Mercury MDL ug/kg
Method Blank	-	U	40
A04342	43	1100	110
A04341	43	800	96
A04473	Confluence	2200	110
A04474	Confluence	2500	110
A04475	Confluence	2000	110
A04476	Confluence	1500	110
A04477	Confluence	3100	170
A04343	Confluence	2200	120
A04344	Confluence	3000	110
A04363	Outfall	2500	110
A04364	Outfall	5500	120
A04365	Outfall	5100	120
A04366	Outfall	4600	120
A04367	Outfall	5100	110
Method Blank	-	U	40
3878A	REFERENCE AREA	220	220
3879A	REFERENCE AREA	U	120
3880A	REFERENCE AREA	150	99
2359A	REFERENCE AREA	200	97
2360A	REFERENCE AREA	120	110
2361A	REFERENCE AREA	170	100
2362A	REFERENCE AREA	110	96
2363A	43	1300	91
2364A	43	1100	91
2365A	43	920	140
2366A	43	1000	87
2367A	43	850	100
2368A	43	880	100
2369A	43	1000	110

Table 1.14 Results of the Analysis for Mercury in Clapper Rails
WA # 0-113 LCP Chemical Site
Based on Dry Weight (except as noted #)

Client ID		Tissue Type	Sample Location	Mercury Conc ug/kg	MDL ug/kg
Method Blank			-	U	40
A04358	#	Feather	Rail #1	9400	290
A04360	#	Feather	Rail #2	15000	630
A03864	#	Feather	CLAPPER RAIL #3	29000	820
A04498		Liver	Rail #1	13000	440
A04359		Liver	Rail #2	22000	490
A04499		Breast Muscle	Rail #1	4600	110
A04361		Breast Muscle	Rail #2	7300	220
A04345		Carcass	Rail #1	5300	140
A04500		Carcass	Rail #2	7900	280
Method Blank			-	U	40
A03865		Liver	CLAPPER RAIL #3	23000	270
A03863		Breast Muscle	CLAPPER RAIL #3	5700	84
A03862		Carcass	CLAPPER RAIL #3	7500	150
Method Blank			-	U	40
LCPNB9501A	#	Feather	RAIL 1	9100	190
LCPNB9501B		Liver	RAIL 1	21000	610
LCPNB9501D		Carcass	RAIL 1	5000	160
LCPNB9502A		Liver	RAIL 2	7800	620
LCPNB9502B	#	Feather	RAIL 2	6800	180
LCPSM9501A		Liver	RAIL 3	16000	640
LCPSM9501B	#	Feather	RAIL 3	4600	250
LCPSM9502E	#	Feather	RAIL 4	4900	220
LCPNB9501F		Breast Muscle	RAIL 1	5500	99
LCPNB9502D		Carcass	RAIL 2	3500	120
LCPNB9502F		Breast Muscle	RAIL 2	4700	120
LCPSM9501D		Carcass	RAIL 3	4200	130
LCPSM9501F		Breast Muscle	RAIL 3	5300	110
LCPSM9502B		Liver	RAIL 4	6800	590
LCPSM9502D		Carcass	RAIL 4	2200	110
LCPSM9502F		Breast Muscle	RAIL 4	2600	130
Method Blank			-	U	40
A04881	#	Feather	LCPTC9503	1700	54
A04888	#	Feather	LCPTC9506	3800	100
A04884	#	Feather	LCPTC9504	3300	68
A03999	#	Feather	LCPTC9505	11000	350
A04895	#	Feather	LCPTC9501	1900	60
A04892	#	Feather	LCPTC9502	2500	79
A04890	#	Feather	LCPTC9507	4300	100
A04882		Liver	LCPTC9503	1900	120
A04886		Liver	LCPTC9506	3800	140
A04883		Liver	LCPTC9504	2900	130
A03997		Liver	LCPTC9505	7100	150
A04896		Liver	LCPTC9501	3700	130
A04893		Liver	LCPTC9502	1900	110
A04889		Liver	LCPTC9507	3300	140
A03994		Carcass	LCPTC9503	760	110
A03991		Carcass	LCPTC9506	1200	96
A03990		Carcass	LCPTC9504	1100	130
A03989		Carcass	LCPTC9505	1600	100
A03996		Carcass	LCPTC9501	1100	120
A03995		Carcass	LCPTC9502	740	89
A03993		Carcass	LCPTC9507	1100	99
A04880		Breast Muscle	LCPTC9503	680	160
A04887		Breast Muscle	LCPTC9506	1400	160
A04885		Breast Muscle	LCPTC9504	1000	160
A03998		Breast Muscle	LCPTC9505	1800	150
A04897		Breast Muscle	LCPTC9501	1200	94
A04894		Breast Muscle	LCPTC9502	850	160
A04891		Breast Muscle	LCPTC9507	1100	150

# denotes that these results are reported on an "as received" basis

Table 1.15 Results of the Analysis for Mercury in Spot (Edible Tissue)
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Sample Location	Mercury Conc ug/kg	Mercury MDL ug/kg
Method Blank	-	U	40
4403	Downstream Purvis Creek	1000	130
4405	Downstream Purvis Creek	1200	100
4406	Downstream Purvis Creek	1100	110
4408	Downstream Purvis Creek	1200	120
4410	Downstream Purvis Creek	1100	120
4412	Downstream Purvis Creek	1300	130
4414	Downstream Purvis Creek	1000	110
4417	Upstream Purvis Creek	1800	120
4419	Upstream Purvis Creek	1400	130
4421	Upstream Purvis Creek	1500	130
4423	Upstream Purvis Creek	1600	130
4425	Upstream Purvis Creek	1400	130
4427	Upstream Purvis Creek	1400	120
4429	Upstream Purvis Creek	1400	130
4431	Turtle River	700	130
4433	Turtle River	850	130
4435	Turtle River	1100	140
4437	Turtle River	1400	140

Table 1.16 Results of the Analysis for Mercury in Diamond Back Terrapins
WA # 0-113 LCP Chemical Site
Based on Dry Weight (except as noted #)

Client ID		Tissue Type	Sample Location	Other Information	Mercury Conc ug/kg	Mercury MDL ug/kg
Method Blank		-	-		U	40
A04362		Egg Shell	Pit area		1100	48
Method Blank		-	-		U	40
04701		Carcass	BD-1 CARCASS		8000	170
04702		Liver	BD-1 LIVER		330000	3900
04703		Turtle Egg	BE-1 EGG	from turtle BD-1	860	77
04704		Turtle Egg	BE-2 EGG	from turtle BD-1	1100	64
04705		Turtle Egg	BE-3 EGG	from turtle BD-1	780	54
04706		Turtle Egg	BE-4 EGG	from turtle BD-1	820	58
04707		Turtle Egg	BE-5 EGG	from turtle BD-1	1000	82
04708		Turtle Egg	BE-6 EGG	from turtle BD-1	690	61
04709		Turtle Egg	BE-7 EGG	from turtle BD-1	870	67
04710		Liver	NTD-1 LIVER		11000	140
04711		Carcass	NTD-1 CARCASS		2000	180
04712		Liver	NTD-2 LIVER		19000	340
04713		Carcass	NTD-2 CARCASS		3400	83
Eggshell-1	#	Egg Shell	REAC Biology Lab	from turtle DD-1	57	29
Eggshell-2	#	Egg Shell	REAC Biology Lab	from turtle DD-1	52	31
Eggshell-3	#	Egg Shell	REAC Biology Lab	from turtle DD-1	34	26
Eggshell-4	#	Egg Shell	REAC Biology Lab	from turtle DD-1	78	32
Eggshell-5	#	Egg Shell	REAC Biology Lab	from turtle DD-1	110	39
04714		Hatchling	HD-1	from turtle DD-1	2100	91
04715		Hatchling	HD-2	from turtle DD-1	2000	65
04716		Hatchling	HD-3	from turtle DD-1	2100	79
04717		Hatchling	HD-4	from turtle DD-1	2100	87
04718		Hatchling	HD-5	from turtle DD-1	2100	95
Method Blank		-	-		U	40
A 00553		Turtle Egg	LCP/Biolab		2200	42
A 00554		Turtle Egg	LCP/Biolab		2300	48
A 00555		Turtle Egg	LCP/Biolab		2100	54
A 00556		Turtle Egg	LCP/Biolab		2200	54
A 00557		Turtle Egg	LCP/Biolab		2300	50

# denotes that this result is on an "as received" basis

Table 1.17 Results of the Analysis for Mercury in Spartina Grass
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Sample Location	Mercury Conc ug/kg	Mercury MDL ug/kg
Method Blank		U	40
A04034	Reference	U	85
A04035	Reference	U	87
A04036	Reference	U	83
A04037	17-18	350	120
A04038	17-18	390	95
A04039	17-18	470	110
A04040	M-1	5800	190
A04041	M-1	3400	100
A04042	M-1	3400	93

Table 1 18 Results of the Analyses for Mercury in Grasshoppers
WA # 0-113 LCP Chemical Site
Based on Dry Weight

		Mercury	
Client ID	Sample Location	Conc ug/kg	MDL ug/kg
Method Blank		U	40
A04031	Reference	U	130
A04032	M-1	1100	120
A04033	M-2	450	100

Table 1.19 Results of the Analysis for Mercury in Carbon Dioxide
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Client ID	Sample Location	Mercury Conc ug	Mercury MDL ug
CO2 Blank	Tissue Lab	U	0.02
Method Blank	Lab	U	40
CO2 Blank	Tissue Lab	U	0.02
Method Blank	Lab	U	40
CO2 Blank	Tissue Lab	U	0.02
Method Blank	Lab	U	40
CO2 Blank	Tissue Lab	U	0.02
Method Blank	Lab	U	40
CO2 Blank	Tissue Lab	U	0.02

Table 1.20 Results of the Analyses for Mercury* in Water
WA # 0-113 LCP Chemical Site

Sample ID	Location	Total Hg (ng/l)	MDL (ng/l)	Elemental Hg (ng/l)	MDL (ng/l)	Methyl Hg (ng/l)	MDL (ng/l)	Dimethyl Hg (ng/l)	MDL (ng/l)	Diethyl Hg (ng/l)	MDL (ng/l)
Blank	-	0.49	0.042	U	0.083	U	0.0298	U	0.0700	U	0.0700
A/B/C 01674	WWTP Effluent	9700	25	0.44	0.083	2.28	0.0756	U	0.0700	U	0.0700
A/B/C 01675	South Seep French Drain	88000	250	0.47	0.083	180	1.5989	U	0.0700	U	0.0700
A/B/C 01676	North Seep French Drain	2700	24	0.20	0.083	27.4	0.0756	U	0.0700	U	0.0700
A/B/C 04719	Storm Drain	82000	96	8.62	0.125	15.2	0.9049	U	0.0700	U	0.0700

* this table includes results for total, elemental, methyl, dimethyl and diethyl mercury

Table 1.21 Results of the Analysis for Mercury* in Sediment and Tissue
WA # 0-113 LCP Chemical Site
based on dry weight

Sample ID	Location	Total Hg (mg/kg)	MDL (mg/kg)	Elemental Hg (mg/kg)	MDL (mg/kg)	Methyl Hg (mg/kg)	MDL (mg/kg)	Dimethyl Hg (mg/kg)	MDL (mg/kg)	Diethyl Hg (mg/kg)	MDL (mg/kg)
Blank	--	NR	NA	NR	NA	U	0.000138	U	0.00019	U	0.00019
B 03872	F-2	NR	NA	NR	NA	0.0464	0.0008	U	0.0002	U	0.0002
B 03873	C-3	NR	NA	NR	NA	0.0480	0.00099	0.0009	0.00027	U	0.00027
B 03874	19-20	NR	NA	NR	NA	0.1010	0.0005	U	0.00014	U	0.00014
B 03875	17-18	NR	NA	NR	NA	0.110	0.0008	U	0.00018	U	0.00018
B 03876	M-1	NR	NA	NR	NA	0.0135	0.0003	U	0.0001	U	0.0001
B 03877	36	NR	NA	NR	NA	0.0734	0.0006	U	0.00016	U	0.00016
Blank	-	NR	NA	NR	NA	U	0.00839	U	0.00067	U	0.00067
A 04500	Rail #2	NR	NA	NR	NA	7.79	0.0183	U	0.0007	U	0.0007
A 04345	Rail #1	NR	NA	NR	NA	4.56	0.0084	U	0.0007	U	0.0007
A 04447	Confluence	NR	NA	NR	NA	2.29	0.0087	U	0.0007	U	0.0007
4410	DS Purvis	NR	NA	NR	NA	0.868	0.00777	U	0.00062	U	0.00062
2366 A	Reference Area	NR	NA	NR	NA	0.812	0.0088	U	0.0007	U	0.0007
04701	BD-1	NR	NA	NR	NA	4.39	0.0149	U	0.0006	U	0.0006
04702	BD-1	NR	NA	NR	NA	9.57	0.0177	U	0.0007	U	0.0007

* this table includes results for total, elemental, methyl, dimethyl and diethyl mercury

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Table 1.22 Results of the Analyses for AVS* and SEM*
WA 3 0-113 LCP Chemical Site
based on dry weight

Sample ID	Location	% Solids	AVS* Conc Ag_2S uM/g	AVS* MDL uM/g	SEM* Conc Cu uM/g	MDL uM/g	Conc Pb uM/g	MDL uM/g	Conc Zn uM/g	MDL uM/g	Conc Cd uM/g	MDL uM/g	Conc Ni uM/g	MDL uM/g
Method Blank		100	0.02	**	U	0.0019	U	0.12	U	0.09	U	0.0005	U	0.005
03872	F-2	27	33	0.82	0.5	0.06	U	1.9	1.9	0.61	0.04	0.009	0.37	0.13
03873	C-3	19	7.00	0.27	0.27	0.007	U	0.44	0.61	0.14	0.009	0.002	0.083	0.029
03874	19-20	33	1.6	0.45	0.47	0.086	0.38	0.27	1.3	0.09	0.008	0.0008	0.2	0.009
03875	17-18	42	15	0.10	0.02	0.0019	U	1.2	0.41	0.38	0.005	0.001	0.16	0.039
03876	M-1	67	U	1.02	0.12	0.037	U	0.12	0.05	0.04	0.0009	0.0005	0.0079	0.0039
03877	36	3[illegible]	U	0.78	0.27	0.049	0.18	0.15	0.67	0.05	0.007	0.0007	0[illegible]	0.005

* AVS denotes Acid Volatile Sulfide and SEM denotes Simultaneously Extracted Metals
** denotes that the units for method blank for AVS are ng

0113\DEL\AR\9511\AVSSEM

QA/QC for PCBs in Soil

Each sample was spiked with a solution of tetrachloro-m-xylene and decachlorobiphenyl as surrogates. The percent recoveries ranged from 41 to 161 and are listed in Table 2.1. Eighty-two out of ninety calculated values were within the acceptable QC limits. Ninety other values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with one of the components of Aroclor 1268. Surrogate solution was not added to one sample.

Samples B 4439, B 4447, C 4483, A 4455, A 4472, 04491 and B 04331 were chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries were 102 and 166; the relative percent difference was 47. Twelve percent recoveries and six relative percent differences, also listed in Table 2.2, were not calculated because the concentration spiked was less than the concentration of analyte in the sample. QC limits are not available for the percent recoveries or the RPDs for Aroclors in soil samples.

Table 2.1 Results of the Surrogate Recoveries
for PCBs in soil
WA # 0-113 LCP Chemical Site

Sample ID	Percent Recovery TCMX	DCBP
SBLK071495	97	NC
04478	@	@
04479	73	NC
04480	107	NC
04481	108	NC
04482	108	NC
04483	139	NC
04483 MS	72	NC
04483 MSD	94	NC
04484	76	NC
04485	120	NC
04486	105	NC
04487	104	NC
04488	106	NC
A4455	113	NC
A4455 MS	105	NC
A4455 MSD	121	NC
A4456	90	NC
A4457	113	NC
A4458	111	NC
A4459	116	NC
A4460	104	NC
A4461	110	NC
A4462	114	NC
A4463	104	NC
A4464	74	NC
A4465	62	NC
A4466	103	NC
A4467	82	NC
A4468	96	NC
A4469	150	NC
A4470	136	NC
A4471	102	NC
A4472	134	NC
A4472 MS	108	NC
A4472 MSD	86	NC

@ Surrogate was not added to this sample

	Advisory QC Limits
Tetrachloro-m-xylene (TCMX)	60-150
Decachlorobiphenyl (DCBP)	60-150

Table 2.1 (Cont) Results of the Surrogate Recoveries for PCBs in soil WA # 0-113 LCP Chemical Site

Sample ID	TCMX	Percent Recovery DCBP
SBLK071295	101	115
B 4438	74	NC
B 4439	80	NC
B 4439MS	96	NC
B 4439MSD	96	NC
B 4440	80	NC
B 4441	60	NC
B 4442	100	NC
B 4443	101	NC
B 4444	79	NC
B 4445	102	NC
B 4446	103	NC
B 4447	81	NC
B 4447MS	96	NC
B 4447MSD	84	NC
B 4448	106	NC
B 4449	82	NC
B 4450	99	NC
B 4451	92	NC
B 4452	117	NC
B 4453	90	NC
B 4454	87	NC

	Advisory QC Limits
Tetrachloro-m-xylene (TCMX)	60-150
Decachlorobiphenyl (DCBP)	60-150

Table 2.1 (Cont) Results of the Surrogate Recoveries for PCBs in soil
WA # 0-113 LCP Chemical Site

Sample ID	Percent Recovery TCMX	DCBP
SBLK071595	118	NC
B04347	134	NC
B04352	149	NC
B04353	107	NC
B04354	141	NC
B04356	120	NC
B04339	145	NC
SBLK071795	41 *	NC
04491 MS	111	NC
04491 MSD	130	NC
04492	122	NC
04493	125	NC
04494	154 *	NC
04495	155 *	NC
SBLK08089503	94	NC
04478	118	NC
SBLK081095	153 *	NC
B04351 MS	125	NC
B04351 MSD	159 *	NC
B04351	125	NC
04489	156 *	NC
04490	112	NC
04491	124	NC
04496	153 *	NC
04497	127	NC
B04346	129	NC
B04348	116	NC
B04349	120	NC
B04350	161 *	NC
B04355	112	NC
B04357	133	NC
B04338	118	NC
B04340	118	NC

	Advisory QC Limits
Tetrachloro-m-xylene (TCMX)	60-150
Decachlorobiphenyl (DCBP)	60-150

Table 2.2 Results of the MS/MSD Analysis for PCBs in Soil
WA # 0-113 LCP Chemical Site
Based on Dry Weight

Analyte Aroclor 1268

Sample ID	Sample Conc (µg/kg)	MS Spike Added (µg/kg)	MS Conc (µg/kg)	MS % Rec	MSD Spike Added (µg/kg)	MSD Conc (µg/kg)	MSD % Rec	RPD
B 4439	160120	6083	250329	NC	6083	275621	NC	NC
B 4447	116672	5307	124473	NC	5307	101992	NC	NC
C 4483	113444	9601	73644	NC	9601	100602	NC	NC
A 4455	52509	5020	53189	NC	5020	67817	NC	NC
A 4472	80316	6510	52547	NC	6510	39289	NC	NC
04491	27651	8064	25480	NC	8064	24457	NC	NC
B 04331	12163	5097	17378	102	5097	20617	166	47

QA/QC for PCBs in Tissue

Each sample was spiked with a solution of tetrachloro-m-xylene and decachlorobiphenyl as surrogates. The percent recoveries ranged from 12 to 68 and are listed in Table 2.3. Ninety-three values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with one of the decachlorobiphenyl components of Aroclor 1268. Although QC limits are not available for surrogates in tissue, eleven of ninety-three values were within the advisory QC limits.

Samples A 04362, 04701, A 04474, A 03862, 4412, 04711, NB 9501 D, A 04345, A 03994 and A 04034 were chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, ranging from 63 to 459, are listed in Table 2.4. The relative percent differences (RPDs), also listed in Table 2.4, ranged from 1 to 13. QC limits are not available for the percent recoveries or the RPDs for Aroclors in tissue samples.

Table 2.3 Results of the Surrogates Recoveries
for PCBs in Tissue
WA # 0-113 LCP Chemical Site

Sample ID	Percent Recovery TCMX	Percent Recovery DCBP
M.BLK 072495 TL	54 *	NC
04703	43 *	NC
04704	39 *	NC
04705	38 *	NC
04706	37 *	NC
04707	41 *	NC
04708	44 *	NC
04701	44 *	NC
04702	55 *	NC
04709	42 *	NC
04711	49 *	NC
04712	46 *	NC
04714	46 *	NC
04715	40 *	NC
04716	42 *	NC
04717	35 *	NC
04710	54 *	NC
04713	33 *	NC
04718	43 *	NC
M.BLK 080195 TL	31 *	NC
NB9501D	44 *	NC
NB9501F	39 *	NC
NB9502D	49 *	NC
NB9502A	55 *	NC
NB9501B	52 *	NC
SM9501D	49 *	NC
SM9501A	46 *	NC
SM9501F	39 *	NC
SM9502D	40 *	NC
SM9502B	47 *	NC
SM9502F	40 *	NC
NB9502F	39 *	NC
A04345 REEXTRACT	49 *	NC
A04362 MS	41 *	NC
A04362 MSD	45 *	NC
4412 MS	41 *	NC
4412 MSD	50 *	NC
04701 MS	38 *	NC
04701 MSD	38 *	NC
04711 MS	48 *	NC
04711 MSD	51 *	NC
04474 MS	50 *	NC
04474 MSD	56 *	NC
NB9501D MS	45 *	NC
NB9501D MSD	43 *	NC
A03862 MS	51 *	NC
A03862 MSD	59 *	NC
A04345 MS	48 *	NC
A04345 MSD	42 *	NC

	Advisory QC Limits
Tetrachloro-m-xylene (TCMX)	60-150
Decachlorobiphenyl (DCBP)	60-150

Table 2.3 (Cont) Results of the Surrogates Recoveries for PCBs in Tissue WA # 0-113 LCP Chemical Site

Sample ID	Percent Recovery TCMX	Percent Recovery DCBP
METHOD BLANK 082195	54 *	NC
A04882	43 *	NC
A04880	48 *	NC
A03990	68	NC
A03991	50 *	NC
A04885	64	NC
A04887	45 *	NC
A04883	57 *	NC
A03994	49 *	NC
A04886	61	NC
A04891	46 *	NC
A04889	62	NC
A03993	44 *	NC
A03998	61	NC
A04897	44 *	NC
A03996	62	NC
A04896	52 *	NC
A03997	61	NC
A03995	49 *	NC
A04894	49 *	NC
A03989	48 *	NC
A04893	56 *	NC
A03994 MS	12 *	NC
A03994 MSD	58 *	NC
METHOD BLANK 082895	38 *	NC
A00553	60	NC
A00554	53 *	NC
A00555	64	NC
A00556	60	NC
A00557	63	NC

	Advisory QC Limits
Tetrachloro-m-xylene (TCMX)	60-150
Decachlorobiphenyl (DCBP)	60-150

**Table 2.3 (Cont) Results of the Surrogates Recoveries for PCBs in Tissue
WA # 0-113 LCP Chemical Site**

	Percent Recovery	
Sample ID	TCMX	DCBP
METHOD BLANK 092295	39 *	NC
04034	50 *	NC
04034 MS	53 *	NC
04034 MSD	50 *	NC
04035	54 *	NC
04036	51 *	NC
04037	51 *	NC
04038	47 *	NC
04039	52 *	NC
04032	57 *	NC
04033	54 *	NC
04040	52 *	NC
04041	47 *	NC
04042	42 *	NC

	Advisory QC Limits
Tetrachloro-m-xylene (TCMX)	60-150
Decachlorobiphenyl (DCBP)	60-150

Table 2.4 Results of the MS/MSD Analysis for PCBs in Tissue
WA#0-113 LCP Chemical
Based on dry weight

Spike mixture: Aroclor 1260

Sample ID	Matrix	Sample Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MS % Rec	MSD Spike Added ug/kg	MSD Conc ug/kg	MSD % Rec	RPD
A04362	Killifish	U	228	257	113	227	291	128	13
04701	Diamond Back Terrapin	U	427	308	72	427	303	71	1
A04474	Killifish	U	757	3302	436	762	3499	459	1
A03862	Clapper Rail	U	292	503	172	292	528	181	1
4412	Spot	U	1179	743	63	1238	807	65	3
04711	Diamond Back Terrapin	U	454	316	70	454	320	71	1
NB9501D	Clapper Rail	U	335	311	93	339	306	90	3
A04345	Clapper Rail	U	325	326	100	320	326	102	2
A03994	Clapper Rail	U	301	244	81	310	274	88	9
A 04034	Spartina Grass	U	232	169	73	232	172	74	2

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QA/QC for TAL Metals in Sediment

QC standards QC-7x100, QC-19x100, QC-426, TMMA #1 and TMMA #2 were used to check the accuracy of the calibration curve. The percent recoveries ranged from 92 to 111 and all thirty-six recoveries were within the 95% confidence limits. The recoveries are listed in Table 2.5. The 95% confidence limits for 38 values are not available

Samples B 4442, B 4448, C 04481 and C 04486 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.6, ranged from 15 to 130. Two percent recoveries were not calculated due to matrix interference and eight values were not calculated because the concentration of analyte spiked was less than that contained in the sample. The relative percent differences (RPDs), also listed in Table 2.6 ranged from 0 (zero) to 50. One value was not calculated due to matrix interference and four others were not calculated because the percent recoveries were not calculated. QC limits are not available for the percent recoveries or the relative percent differences of metals in sediments.

The results of the spike blank analysis are reported in Table 2.7. The percent recoveries ranged from 74 to 116. QC limits are not available for this analysis.

Table 2.5 Results of the Analysis of the QC Standard for the Sediment Samples
WA # 0-113 LCP Chemical Site

Metal	Date Analyzed	Quality Control Standard	Conc Recovered ug/l	True Value ug/l	95 % Confidence Interval	% REC
Aluminum	07/24/95	QC-7 x100	1025	1000	N/A	103
	07/24/95	QC-426	430	411	337 - 485	105
Antimony	07/24/95	QC-19 x100	1044	1000	N/A	104
Arsenic	07/18/95	TMMA #1	52	50	41.9-55.9	104
Barium	07/24/95	QC-7 x100	999	1000	N/A	100
	07/24/95	QC-426	164	167	137 - 197	98
Beryllium	07/24/95	QC-19 x100	1047	1000	N/A	105
	07/24/95	QC-426	140	134	110 - 158	104
Cadmium	07/24/95	QC-19 x100	1048	1000	N/A	105
	07/24/95	QC-426	132	128	105 -151	103
Calcium	07/24/95	QC-19 x100	1063	1000	N/A	106
Chromium	07/24/95	QC-19 x100	1070	1000	N/A	107
	07/24/95	QC-426	235	222	182 - 262	106
Cobalt	07/24/95	QC-19 x100	1082	1000	N/A	108
	07/24/95	QC-426	182	167	137 - 197	109
Copper	07/24/95	QC-19 x100	1042	1000	N/A	104
	07/24/95	QC-426	97	95	78 - 112	102
Iron	07/24/95	QC-19 x100	1092	1000	N/A	109
	07/24/95	QC-426	205	189	155 - 223	108
Lead	07/24/95	QC-19 x100	1070	1000	N/A	107
	07/24/95	QC-426	232	211	173 - 249	110
Magnesium	07/24/95	QC-19 x100	996	1000	N/A	100
Manganese	07/24/95	QC-19 x100	1057	1000	N/A	106
	07/24/95	QC-426	347	333	373 - 293	104
Mercury	07/18/95	TMMA #1	2.21	2.00	1.40-2.49	111
Nickel	07/24/95	QC-19 x100	1083	1000	N/A	108
	07/24/95	QC-426	377	344	282 - 406	110
Potassium	07/24/95	QC-7 x100	9393	10000	N/A	94
Selenium	07/18/95	TMMA #1	51	50	39.4-57.4	102
Silver	07/24/95	QC-7 x100	1025	1000	N/A	103
	07/24/95	QC-426	57	56	46 - 66	102
Sodium	07/24/95	QC-7 x100	979	1000	N/A	98
Thallium	07/19/95	TMMA #2	50	50	39.9-57.97	100
Vanadium	07/24/95	QC-19 x100	1052	1000	N/A	105
	07/24/95	QC-426	209	206	169 - 243	101
Zinc	07/24/95	QC-19 x100	1062	1000	N/A	106
	07/24/95	QC-426	181	172	141 - 203	105

Table 2.5 (Cont) Results of the Analysis of the QC Standard for the Sediment Samples WA # 0-113 LCP Chemical Site

Metal	Date Analyzed	Quality Control Standard	Conc Recovered ug/l	True Value ug/l	95 % Confidence interval	% REC
Aluminum		QC-7 x100	1026	1000	N/A	103
		QC-426	458	411	337 - 485	111
Antimony		QC-19 x100	967	1000	N/A	97
Arsenic		TMMA #1	48	50	41.9-55.9	96
Barium		QC-7 x100	998	1000	N/A	100
		QC-426	165	167	137 - 197	99
Beryllium		QC-19 x100	1022	1000	N/A	102
		QC-426	138	134	110 - 158	103
Cadmium		QC-19 x100	1030	1000	N/A	103
		QC-426	133	128	105 - 151	104
Calcium		QC-19 x100	1047	1000	N/A	105
Chromium		QC-19 x100	1053	1000	N/A	105
		QC-426	234	222	182 - 262	105
Cobalt		QC-19 x100	1064	1000	N/A	106
		QC-426	181	167	137 - 197	108
Copper		QC-19 x100	1032	1000	N/A	103
		QC-426	99	95	77.9 - 112	104
Iron		QC-19 x100	1066	1000	N/A	107
		QC-426	202	189	155 - 223	107
Lead		QC-19 x100	1052	1000	N/A	105
		QC-426	223	211	173 - 249	106
Magnesium		QC-19 x100	997	1000	N/A	100
Manganese		QC-19 x100	1040	1000	N/A	104
		QC-426	346	333	273 - 393	104
Mercury		TMMA #1	2	2	1 40-2.49	100
Nickel		QC-19 x100	1058	1000	N/A	106
		QC-426	375	344	282 - 406	109
Potassium		QC-7 x100	9420	10000	N/A	94
Selenium		TMMA #1	50	50	39.4-57 4	100
Silver		QC-7 x100	1025	1000	N/A	103
		QC-426	53	56	46-66.2	95
Sodium		QC-7 x100	1015	1000	N/A	102
Thallium		TMMA #2	46	50	39.9-57.97	92
Vanadium		QC-19 x100	1028	1000	N/A	103
		QC-426	207	206	169 - 243	100
Zinc		QC-19 x100	1039	1000	N/A	104
		QC-426	179	172	141 - 203	104

Table 2.6 Results of the MS/MSD Analysis for TAL Metals in Sediment
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc mg/kg	Original Conc Spike mg/kg	Original Conc Dup mg/kg	Recovered Conc Spike mg/kg	Recovered Conc Dup mg/kg	% Recovery Spike	% Recovery Dup	RPD
Antimony	B4442	U	48.4	48.2	14.5	11.0	30	23	27
Antimony	B4448	U	63.3	61.4	11.6	9.48	18	15	17
Arsenic	B4442	5.65	4.33	4.02	6.76	5.79	MI	MI	NC
Arsenic	B4448	9.14	7.22	7.04	11.3	11.8	30	38	23
Barium	B4442	39.4	96.8	96.4	138	134.0	102	98	4
Barium	B4448	33.9	127	123	163	157.0	102	100	2
Beryllium	B4442	0.82	48.4	48.2	49.4	48.3	100	98	2
Beryllium	B4448	1.53	63.3	61.4	65.4	63.2	101	100	0
Cadmium	B4442	0.18	48.4	48.2	47.9	46.7	99	97	2
Cadmium	B4448	0.17	63.3	61.4	62.4	60.3	98	98	0
Chromium	B4442	23.9	48.4	48.2	71.7	68.9	99	93	6
Chromium	B4448	61.3	63.3	61.4	127	122	104	99	5
Cobalt	B4442	4.41	48.4	48.2	52.6	51.0	100	97	3
Cobalt	B4448	8.97	63.3	61.4	71.5	69.2	99	98	1
Copper	B4442	9.55	48.4	48.2	58.0	55.4	100	95	5
Copper	B4448	20.8	63.3	61.4	84.3	82.2	100	100	0
Lead	B4442	19.9	48.4	48.2	63.1	82.5	89	130	37
Lead	B4448	51.0	63.3	61.4	107	112	88	99	12
Manganese	B4442	280	48.4	48.2	317	302	76	46	50
Manganese	B4448	462	63.3	61.4	573	546	NC	NC	NC
Mercury	B4442	0.127	0.428	0.455	0.525	0.561	93	95	3
Mercury	B4448	152	0.625	0.690	143	150	NC	NC	NC
Nickel	B4442	10.0	48.4	48.2	58.2	56.1	100	96	4
Nickel	B4448	17.0	63.3	61.4	82.0	78.5	103	100	2
Selenium	B4442	0.627	4.33	4.02	2.77	2.25	49	40	20
Selenium	B4448	0.946	7.22	7.04	3.76	2.81	39	26	38
Silver	B4442	0.17	48.4	48.2	47.4	44.9	98	93	5
Silver	B4448	0.32	63.3	61.4	60.9	59.5	96	96	1
Thallium	B4442	0.418	4.33	4.02	1.73	1.45	30	26	16
Thallium	B4448	0.631	7.22	7.04	2.60	2.53	27	27	1
Vanadium	B4442	33.5	96.8	96.4	131	125	101	95	6
Vanadium	B4448	66.8	127	123	196	187	102	98	4
Zinc	B4442	109	48.4	48.2	154	148	93	81	14
Zinc	B4448	77.0	63.3	61.4	142	139	103	101	2

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Table 2.6 (Cont) Results of the MS/MSD Analysis for TAL Metals in Sediment
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc mg/kg	Original Conc Spike mg/kg	Original Conc Dup mg/kg	Recovered Conc Spike mg/kg	Recovered Conc Dup mg/kg	% Recovery Spike	% Recovery Dup	RPD
Antimony	C04481	U	214	207	71.0	82.3	33	40	18
Antimony	C04486	3.20	143	195	44.3	68.4	29	34	15
Arsenic	C04481	5.13	21.8	22.1	21.8	22.6	76	79	3
Arsenic	C04486	5.45	18.6	19.6	16.0	21.6	57	82	37
Barium	C04481	22.5	428	414	446	419	99	96	3
Barium	C04486	22.8	286	389	306	410	99	99	0
Beryllium	C04481	0.80	214	207	216	202	101	97	3
Beryllium	C04486	1.10	143	195	144	196	100	100	0
Cadmium	C04481	0.60	214	207	209	193	97	93	5
Cadmium	C04486	0.50	143	195	139	188	97	96	1
Chromium	C04481	94.2	214	207	309	293	100	96	4
Chromium	C04486	130	143	195	276	329	102	102	0
Cobalt	C04481	9.60	214	207	225	210	101	97	4
Cobalt	C04486	7.10	143	195	151	203	101	101	0
Copper	C04481	72.6	214	207	287	274	100	97	3
Copper	C04486	23.8	143	195	166	218	100	100	0
Lead	C04481	232	214	207	428	415	92	88	4
Lead	C04486	52.2	143	195	193	239	99	96	3
Manganese	C04481	118	214	207	330	314	99	95	5
Manganese	C04486	127	143	195	272	326	102	102	1
Mercury	C04481	309	2.37	2.57	299	323	NC	NC	NC
Mercury	C04486	58.5	1.83	2.03	56.8	63.9	NC	NC	NC
Nickel	C04481	20.9	214	207	235	222	100	97	3
Nickel	C04486	14.1	143	195	159	212	101	102	0
Selenium	C04481	0.466	21.8	22.1	10.0	11.5	44	50	13
Selenium	C04486	U	18.6	19.6	8.17	8.62	44	44	0
Silver	C04481	1.30	214	207	199	189	92	91	2
Silver	C04486	0.50	143	195	136	185	95	95	0
Thallium	C04481	0.466	21.8	22.1	9.61	11.1	42	48	14
Thallium	C04486	0.389	18.6	19.6	7.80	8.23	40	40	0
Vanadium	C04481	66.9	428	414	493	466	100	96	3
Vanadium	C04486	65.7	286	389	352	457	100	101	0
Zinc	C04481	180	214	207	395	410	101	111	10
Zinc	C04486	74.3	143	195	222	271	103	101	2

Table 2.7 Results of the Blank Spike Analysis
for TAL Metals in Sediment
WA # 0-113 LCP Chemical Site

Metal	Spiked Conc mg/kg	Sand Blk Conc mg/kg	Rec Conc mg/kg	% Rec
Aluminum	385	12.9	410	103
Antimony	48.1	U	47.1	98
Arsenic	4.95	U	5.74	116
Barium	96.2	U	94.1	98
Beryllium	48.1	U	49.4	103
Cadmium	48.1	U	49.1	102
Calcium	385	12.2	412	104
Chromium	48.1	U	50.3	105
Cobalt	48.1	U	50.5	105
Copper	48.1	U	48.6	101
Iron	385	124	449	85
Lead	48.1	U	51.8	108
Magnesium	385	3.7	384	99
Manganese	48.1	U	49.2	102
Mercury	0.400	U	0.41	102
Nickel	48.1	U	50.9	106
Potassium	385	40.1	423	100
Selenium	4.95	U	5.35	108
Silver	48.1	U	47.7	99
Sodium	385	8.4	381	97
Thallium	4.95	U	4.26	86
Vanadium	96.2	U	98.4	102
Zinc	48.1	4.4	54.1	103

Table 2.7 (Cont) Results of the Blank Spike Analysis for TAL Metals in Sediment WA # 0-113 LCP Chemical Site

Metal	Spiked Conc mg/kg	Sand Blk Conc mg/kg	Rec Conc mg/kg	% Rec
Aluminum	400	20.6	436	104
Antimony	50.0	U	46.9	94
Arsenic	4.85	U	5.05	104
Barium	100	U	98.6	99
Beryllium	50.0	U	50.8	102
Cadmium	50.0	U	50.7	101
Calcium	400	11.0	422	103
Chromium	50.0	U	51.9	104
Cobalt	50.0	U	52.0	104
Copper	50.0	U	51.0	102
Iron	400	114	468	89
Lead	50.0	1.0	51.3	101
Magnesium	400	6.5	403	99
Manganese	50.0	U	51.3	103
Mercury	0.400	U	0.400	100
Nickel	50.0	U	52.7	105
Potassium	400	19.5	399	95
Selenium	4.85	U	4.95	102
Silver	50.0	U	37.2	74
Sodium	400	8.4	404	99
Thallium	4.85	U	3.88	80
Vanadium	100	U	102	102
Zinc	50.0	4.6	54.4	100

QA/QC for Mercury in Sediment

QC standard TMMA #1 was used to check the accuracy of the calibration curve. The percent recoveries were 105 and 110 and both recoveries were within the 95% confidence limits. The recoveries are listed in Table 2.8

Samples A 4455, A 4465, B 04347 and B 04349 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.9, ranged from 64 to 98. Four percent recoveries were not calculated because the concentration of analyte in the sample was greater than the concentration spiked. The relative percent differences (RPDs), also listed in Table 2.9, were 8 and 13. Two values were not calculated because the concentration of analyte in the sample was greater than the concentration spiked. There are no QC limits for the recoveries of mercury in sediments.

The results of the blank spike analysis are reported in Table 2.10. The percent recoveries were 99 and 105.

Table 2.8 Results of the Analysis of the QC Standard for Mercury in Sediment
WA# 0-113 LCP Chemical Site

Metal	Date Analyzed	Quality Control Standard	Conc Recovered ug/l	True Value ug/l	95 % Confidence Interval	% REC
Mercury	07/18/95	TMMA #1	2.19	2.00	1.40-2.49	110
	07/20/95	TMMA #1	2.10	2.00	1.40-2.49	105

Table 2.9 Results of the MS/MSD Analysis for Mercury in Sediment
WA# 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc ug/kg	Original Conc Spike ug/kg	Original Conc Dup ug/kg	Recovered Conc Spike ug/kg	Recovered Conc Dup ug/kg	% Recovery Spike	% Recovery Dup	RPD
Mercury	A4455	76471	579	568	73274	68624	NC	NC	NC
Mercury	A4465	296549	1102	1047	289384	310681	NC	NC	NC
Mercury	B04347	39356	1573	1979	40900	41065	98	86	13
Mercury	B04349	20444	1113	1216	21155	21283	64	69	8

Table 2.10 Results of the Blank Spike Analysis
for Mercury in Sediment
WA# 0-113 LCP Chemical Site

Metal	Spiked Conc mg/kg	Rec Conc mg/kg	% Rec
Mercury	0.400	0.396	99
Mercury	0.400	0.420	105

QC for Mercury in Tissue

QC standard TMMA #1 was used to check the accuracy of the calibration curve. The percent recoveries ranged from 96 to 116 and all seven recoveries were within the 95% confidence limits. The recoveries are listed in Table 2.11.

Samples 4406, A 04477, A 04360, A 04345, A 04500, A 04362, 2365 A, A 03862, 04701, 04711, LCPNB 9501 D, LCPSM 9502 E, A 03994, A 03999, A 04031 and A 04034 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.12, ranged from 25 to 148. Six values were not calculated because the concentration of mercury in the sample exceeded the concentration spiked. The relative percent differences (RPDs), also listed in Table 2.12 ranged from 0 (zero) to 95. Three values were not calculated because the concentration of mercury in the sample exceeded the concentration spiked. Limits are not available for the percent recoveries or RPDs for mercury in tissue samples.

The results of the blank spike analysis are reported in Table 2.13. The percent recoveries ranged from 96 to 103 and all seven values were within the acceptable QC limits.

Table 2.11 Results of the Analysis of the QC Standard for Mercury in Tissue
WA # 0-113 LCP Chemical Site

Metal	Quality Control Standard	Conc Rec ug/l	True Value ug/l	95 % Confidence Interval	% Rec
Mercury	TMMA #1	2.24	2.00	1.40-2.49	112
Mercury	TMMA #1	2.32	2.00	1.40-2.49	116
Mercury	TMMA #1	2.16	2.00	1.40-2.49	108
Mercury	TMMA #1	1.92	2.00	1.40-2.49	96
Mercury	TMMA #1	2.14	2.00	1.40-2.49	107
Mercury	TMMA #1	2.11	2.00	1.40-2.49	106
Mercury	TMMA #1	2.03	2.00	1.40-2.49	102

Table 2.12 Results of the MS/MSD Analysis for Mercury in Tissue
WA # 0–113 LCP Chemical Site

Metal	Sample ID	Sample Conc ug/kg	Original Conc Spike ug/kg	Original Conc Dup ug/kg	Recovered Conc Spike ug/kg	Recovered Conc Dup ug/kg	% Recovery Spike	% Recovery Dup	RPD
Mercury	4406	1115	1280	1057	2311	2125	93	96	2
Mercury	A04477	3064	1569	1509	4267	4460	77	92	19
Mercury	A04360	15188	500	588	12325	15000	NC	NC	NC
Mercury	A04345	5304	1190	1258	7060	6440	148	90	48
Mercury	A04500	7890	1149	1061	8172	8626	25	69	95
Mercury	A04362	1123	454	529	1735	1603	135	91	39
Mercury	2365A	917	1401	1512	2206	2343	92	94	2
Mercury	A03862	7463	1200	1279	8920	8645	121	92	27
Mercury	04701	7965	1850	1890	9325	9480	72	79	9
Mercury	04711	2014	1715	1567	3506	3636	87	103	17
Mercury	LCPNB9501D	5023	1756	1020	6080	5577	59	54	9
Mercury	LCPSM9502E	4922	558	500	5971	6025	NC	NC	NC
Mercury	A03994	762	849	1217	1460	1802	82	85	4
	A03999	11140	716	650	11010	11144	NC	NC	NC
Mercury	A04031	26.0	1290	1241	1265	1203	96	95	1
	A04034	30.0	898	934	916	948	99	98	0

Table 2.13 Results of the Blank Spike Analysis for Mercury in Tissue
WA# 0-113 LCP Chemical Site

Metal	Spiked Conc ug/l	Rec Conc ug/l	% Rec	Recommended Limit
Mercury	2.00	1.99	100	75-125
Mercury	2.00	1.94	97	75-125
Mercury	2.00	1.91	96	75-125
Mercury	2.00	1.99	100	75-125
Mercury	2.00	2.03	102	75-125
Mercury	2.00	1.96	98	75-125
Mercury	2.00	2.05	103	75-125

QA/QC for Mercury in Water, Sediment and Tissue*

A blank was spiked for the total mercury analysis. The percent recovery, listed in Table 2.14, was 95. No QC limits exist for this analysis.

Sample A/B/C 01676 was chosen for matrix spike (MS) analyses for elemental and dimethyl mercury in the water samples. The percent recoveries, listed in Table 2.15, were 96 for elemental mercury and 105 for dimethyl mercury. No QC limits exist for matrix spike recoveries for this analysis.

Sample A/B/C 01676 was chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses for total and methyl mercury in the water samples. The percent recoveries, listed in Table 2.16, were both 126 for total mercury and 97 and 109 for methyl mercury. The relative percent differences (RPDs), also listed in Table 2.16, were 0 (zero) and 12. No QC limits exist for either recoveries or RPDs for this analysis.

Sample A/B/C 01675 was chosen for the duplicate analysis for total mercury, elemental mercury, methyl mercury, dimethyl mercury and diethyl mercury in the water samples. The RPDS, listed in Table 2.17, ranged from 1 to 4. The RPD was not calculated in two cases because the analyte was not detected in either analysis. No QC limits exist for the duplicate analyses for mercury or its compounds in water.

Samples B 03872, B 03875, B 03877, A 04447 and 04701 were chosen for MS analyses for methyl and dimethyl mercury for the sediment and tissue samples. The percent recoveries, listed in Table 2.18, ranged from 63 to 120. No QC limits exist for matrix spike recoveries for this analysis.

Samples 4410, B 03874 and B 03877 were chosen for the duplicate analysis for methyl mercury, dimethyl mercury and diethyl mercury in the sediment and tissue samples. The RPDs, listed in Table 2.19, ranged from 0 (zero) to 15. The RPD was not calculated in four other instances because the analyte was not detected in either analysis. No QC limits exist for the duplicate analyses for mercury or its compounds in sediment or tissue.

Standard reference materials 1641c, DORM-2, DOLT-2 and IAEA-356 were analyzed for total and methyl mercury. The percent recoveries, listed in Table 2.20, ranged from 85 to 110. No QC limits exist for the analysis of reference samples for mercury or its compounds in water, sediment or tissue.

* this section includes the results for total, elemental, methyl, dimethyl and diethyl mercury.

Table 2.14 Results of the Blank Spike Analysis
for Total Mercury in Water
WA # 0-113 LCP Chemical Site

Analyte	Sample Conc ng/l	Spike Conc ng/l	Rec Conc ng/l	% Rec
Total Mercury	0.486	36.7	35.5	95

Table 2.15 Results of the Matrix Spike Analysis
for Mercury in Water
WA # 0-113 LCP Chemical Site

Analyte	Sample ID	Sample Conc ng/l	Spike Conc ng/l	Rec Conc ng/l	% Rec
Elemental Mercury	A/B/C 01676	0.197	8.33	8.19	96
Dimethyl Mercury	A/B/C 01676	U	3.17	3.32	105

Table 2.16 Results of the MS/MSD Analyses for Mercury in Water
WA # 0-113 LCP Chemical Site

Analyte	Sample ID	Sample Conc ng/l	Original Conc Spike ng/l	Original Conc Dup ng/l	Recovered Conc Spike ng/l	Recovered Conc Dup ng/l	% Recovery Spike	% Recovery Dup	RPD
Total Mercury	A/B/C 01676	2730	388	388	3220	3220	126	126	0
Methyl Mercury	A/B/C 01676	27.4	4.12	4.12	31.4	31.9	97	109	12

Table 2.17 Results of the Duplicate Analysis for Mercury in Water WA # 0-113 LCP Chemical Site

Analyte	Sample ID	Initial Analysis ng/l	Duplicate Analysis ng/l	RPD
Total Mercury	A/B/C 01675	88000	91200	4
Elemental Mercury	A/B/C 01675	0.470	0.477	1
Methyl Mercury	A/B/C 01675	182	178	2
Dimethyl Mercury	A/B/C 01675	U	U	NA
Diethyl Mercury	A/B/C 01675	U	U	NA

Table 2.18 Results of the Matrix Spike Analysis for Mercury in Sediment and Tissue WA # 0-113 LCP Chemical Site

Analyte	Sample ID	Sample Conc mg/kg	Spike Conc mg/kg	Rec Conc mg/kg	% Rec
Methyl Mercury	B 03872	0.0464	0.188	0.232	99
Methyl Mercury	B 03875	0.110	0.180	0.292	101
Dimethyl Mercury	B 03875	U	0.00444	0.00531	120
Methyl Mercury	B 03877	0.0749	0.148	0.225	101
Methyl Mercury	A 04447	2.29	2.84	5.33	107
Methyl Mercury	04701	4.39	2.79	6.16	63
Dimethyl Mercury	A 04447	U	0.0130	0.0103	79
Dimethyl Mercury	04701	U	0.0131	0.0117	89

Table 2.19 Results of the Duplicate Analysis
for Mercury in Sediment and Tissue
WA # 0-113 LCP Chemical Site

Analyte	Sample ID	Initial Analysis mg/kg	Duplicate Analysis mg/kg	RPD
Methyl Mercury	4410	0.868	0.872	0
Dimethyl Mercury	4410	U	U	NA
Diethyl Mercury	4410	U	U	NA
Methyl Mercury	B 03874	0.101	0.117	15
Methyl Mercury	B 03877	0.0734	0.0749	2
Dimethyl Mercury	B 03874	U	U	NA
Diethyl Mercury	B 03874	U	U	NA

Table 2.20 Results of the Analysis of the Standard Reference Material for Mercury
WA # 0-113 LCP Chemical Site

Analyte	Sample ID	Units	Certified Value	Value Found	Percent Recovery
Total Mercury	1641c	ng/l	1470000	1360000	93
Methyl Mercury	DOLT-2	ug/g	0.693	0.765	110
Methyl Mercury	DORM-2	ug/g	4.47	4.31	96
Methyl Mercury	IAEA-356	ug/g	0.00546	0.00515	94
Methyl Mercury	IAEA-356	ug/g	0.00546	0.00462	85
Methyl Mercury	DOLT-2	ug/g	0.693	0.753	109
Methyl Mercury	DORM-2	ug/g	4.47	4.09	91

QC for Mercury in Soil Extracts

QC standard TMMA #1 was used to check the accuracy of the calibration curve. The percent recoveries were 101 and 110 and both recoveries were within the 95% confidence limits. The recoveries are listed in Table 2.21.

The results of the blank spike/blank spike duplicate analysis are listed in Table 2.22. The percent recoveries ranged from 100 to 102. QC limits are not available for the percent recovery of mercury in soil extracts.

Table 2.21 Results of the QC Standard Analysis for Mercury in Soil Extracts
WA# 0-113 LCP Chemical Site

Metal	Date Analyzed	Quality Control Standard	Conc Recovered ug/l	True Value ug/l	95 % Confidence Interval	% REC
Mercury	08/21/95	TMMA #1	2.20	2.00	1.40-2.49	110
Mercury	08/22/95	TMMA #1	2.01	2.00	1.40-2.49	101

Table 2.22 Results of the BS/BSD Analysis for Mercury in Soil Extracts
WA# 0-113 LCP Chemical Site

Metal	Sample Conc ug/L	Original Conc Spike ug/L	Original Conc Dup ug/L	Recovered Conc Spike ug/L	Recovered Conc Dup ug/L	% Recovery Spike	% Recovery Dup
Mercury	U	2.00	2.00	2.00	2.00	100	100
Mercury	U	2.00	2.00	2.04	2.03	102	102

REAC, E[illegible]n, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI[illegible] [illegible]F CUSTODY RECORD

Project Name LCP CHEMICAL, GA
Project Number 0113
RFW Contact MARK HUSTON Phone 908 321 4285

No. 00889

SHEET NO 1 OF 1

092195

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg	PCBs	MOISTURE	LIPIDS
307	A04031	REFERENCE	X,	9/19/95	1	8oz glass / 4°C	X	X HA	X	X HA
308	A04032	M-1	X,	9/20/95	1	8oz glass / 4°C	X	X	X	X
309	A04033	M 3	X,	9/20/95	1	8oz glass / 4°C	X	X	X	X
310	A04034	REFERENCE	X2	9/19/95	1	ZIPLOCK / 4°C	X	X	X	X
311	A04035	REFERENCE	X2	9/19/95	1		X	X	X	X
312	A04036	REFERENCE	X2	9/19/95	1		X	X	X	X
313	A04037	17-18	X2	9/20/95	1		X	X	X	X
314	A04038	17-18	X2	9/20/95	1		X	X	X	X
315	A04039	17-18	X2	9/20/95	1		X	X	X	X
316	A04040	M-1	X2	9/20/95	1		X	X	X	X
317	A04041	M-1	X2	9/20/95	1		X	X	X	X
318	A04042	M-1	X2	9/20/95	1		X	X	X	X

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions
X, = GRASSHOPPERS
X2 = SPARTINA (GRASS)

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

* = Please analyze all samples for lipids - M Huston 9/26/95
** = Sample A04031 to be analyzed for Hg + % moisture only - M. Huston 9/28/95 due to insufficient tissue

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/analyses	Mark Huston	9/20/95	B Lewa	9/21/95	0930	12/Analyses	B Lewa	9/21/95	[illegible]	9/21/95	11:45
all/Analysis	[illegible]	9/26/95	B Lewa	9/26/95	0845	All Analyses	B Lewa	9/26/95	Colleen Egan	9/26/95	3:00

000025

REAC, Ed...on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI.. OF CUSTODY RECORD

Project Name LCP
Project Number 03347-040-001-0113 01
RFW Contact Mark Huston Phone 908-321-4285

No: 01190

SHEET NO. 1 OF 1

071395

Sample Identification | **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	TAL Metals	PCBs		
261	04478	I-1	SD	7/11/95	1	8oz clear / 4°C	X	X		
262	04479	I-2			2		X	X		
263	04480	I-3			1		X	X		
264	04481	J-1					X	X		
265	04482	J-2					X	X		
266	04483	J-3					X	X		
267	04484	K-1					X	X		
268	04485	K-2					X	X		
269	04486	K-3					X	X		
270	04487	L-1					X	X		
271	04488	L-2					X	X		
272	04489	L-3					X	X		
273	04490	M-1					X	X		
274	04491	M-3					X	X		
275	04492	N-3					X	X		
276	04493	O-1					X	X		
277	04494	O-2					X	X		
278	04495	O-3					X	X		
279	04496	P-1					X	X		
280	04497	P-2					X	X		

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions
Extra volume is provided for sample 04479 due to the high water content of the sample

Note- All of the sample #s are preceeded by the letter C except #04479 which is labeled D and E 04479. BL

Peer reviewed [signature] 7/13/95

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FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
1-20 / Analysis	[signature]	7/12/95	B. Lewa	7/13/95	1000	20 / Analysis	B. Lewa	7/13/95	Amy Bowman	07 13 95	1115
						20 / Analysis	Amy Bowman	7 13 95	B. Lewa	7/13/95	1430
						20 / Analysis	B. Lewa	7/13/95	[signature]	7/13/95	14:30

FORM #4 8/94

030036

REAC, E[illegible]on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: ICP Chemical
Project Number: 03347-040-001-0113-01
RFW Contact: M Hudson   Phone: 321-4285

No 01157

SHEET NO 1 OF 1

071495

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg	PCB		
319	B04346	83	SD	7-12-95	1	8oz glass jar/4°C	✓	✓		
320	B04347	82								
321	B04348	81								
322	B04349	80								
323	B04350	79								
324	B04351	78								
325	B04352	77								
326	B04353	76								
327	B04354	75								
328	B04355	74								
329	B04356	73								
330	B04357	72								
331	B04338	SED-33-34A	SD	7-11-95		8oz glass jar/4°C	✓	✓		
332	B04339	SED-45A								
333	B04340	SED-44A								

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions
QA M Hudson
Note - ~~these samples were also analyzed for TAL Metals~~

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analyses	Mark Hudson	7/13/95	B Lewis	7/14/95	1000	15/PCB	B Lewis	7/14/95	Amy Bowman	07-14-95	1130
All analysis	Amy Bowman	7-17-95	B Lewis	7/17/95	1400	15/ Hg[illegible]	B Lewis	7/19/95	[illegible]	7/19/95	8:20am

00035

REAC, Ec[illegible]on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI[illegible] OF CUSTODY RECORD

Project Name [illegible]
Project Number [illegible]
RFW Contact [illegible] Phone [illegible]

No: 00936

SHEET NO. 1 OF 1

071195

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCB			
231	B4438	[illegible]	SD	7-9-95	1	8oz glass/4°C	✓			
232	B4439	52								
233	B4440	53								
234	B4441	54								
235	B4442	55								
236	B4443	66		7-10-95						
237	B4444	67								
238	B4445	64								
239	B4446	41								
240	B4447	70								
241	B4448	62								
242	B4449	63								
243	B4450	60								
244	B4451	71								
245	B4452	68								
246	B4453	69								
247	B4454	65								

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions
Sample# B04443 was broken during shipment BL

Note - All (17) samples were also analyzed for TAL Metals

OK [illegible] 7/10

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	[illegible]	7/10/95	B Lewis	7/11/95	0940	17/Analysis	B Lewis	7/11/95	[illegible]	7-11-95	1100
All/Storage	[illegible]	7/12/95	B Lewis	7/12/95	1500	17/Analysis	B Lewis	[illegible]	[illegible]	7/11/95	[illegible]

00020

REAC, E[illegible]n, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI[illegible] OF CUSTODY RECORD

Project Name [illegible]
Project Number [illegible]
RFW Contact [illegible] Phone [illegible]

No. 00934

SHEET NO 1 OF 2

070195

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg, PCB % moisture % lipids	Total wt(g)		
195	4402	DOWNSTREAM [illegible]	X2	7/8/95	1	FOIL / DRY ICE	✓	40.10		
196	4403		X1					14.90		
197	4404		X2					34.10		
198	4405		X1					15.25		
199	4406		X1					15.85		
200	4407		X2					40.05		
201	4408		X1					15.20		
202	4409		X2					30.50		
203	4410		X1					15.35		
204	4411		X2					44.80		
205	4412		X1					16.15		
206	4413		X2					41.30		
207	4414		X1					15.85		
208	4415		X2					41.47		
209	4416	UPSTREAM [illegible]	X2					34.70		
210	4417		X1					12.2		
211	4418		X2					36.95		
212	4419		X1					12.05		
213	4420		X2					40.0		
214	4421		X1					12.0		

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions
X1 = EDIBLE FISH TISSUE
X2 = INEDIBLE FISH TISSUE

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

GASC Met Fish

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All / analysis	[illegible]	7/11/95	B Lewis	7/11/95	0940	20/Analysis	B Lewis	7/11/95	[illegible]	7/11/95	10:45 AM
10 [illegible] All/Analysis	[illegible]	7/12/95	B Lewis	7/12/95	0950	10/Mercury Ana	B Lewis	7/13/95	[illegible]	7/13/95	5:00

8/94

REAC, E... on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI... F CUSTODY RECORD

Project Name: LCP CHEMICAL
Project Number: 03347-040-001-1142-01
RFW Contact: JOHN JOHNSON Phone: 908 321-4200

No. 00935

SHEET NO. 2 OF 2

071195

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg, PCB, % Moisture, % lipid	Final wt (g)		
215	4422	BURLAP PERKS	X2	7-6-95	1	FOIL / DRY ICE	✓	36.45		
216	4423	↓	X1	↓	↓	↓	↓	12.55		
217	4424		X2					33.55		
218	4425		X1					12.0		
219	4426		X2					36.50		
220	4427		X1					12.05		
221	4428		X2					44.35		
222	4429	↓	X1					12.70		
223	4430	TURTLE RIVER	X2					35.95		
224	4431	↓	X1					11.15		
225	4432		X2					25.70		
226	4433		X1					11.2		
227	4434		X2					26.2		
228	4435		X1					11.15		
229	4436		X2					26.7		
230	4437	↓	X1	↓	↓	↓	↓	9.05		

00100

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions
X1 = EDIBLE FISH TISSUE
X2 = INEDIBLE FISH TISSUE

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

QA/QC Mike Bailey

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[illegible]	7/11/95	B. Lewis	7/11/95	0740	ALL/Analyses	B. Lewis	7/11/95	[illegible]	7/11/95	1045AM
ALL/Analyses	[illegible]	7/12/95	B. Lewis	7/12/95	1450	Hg Analyses	B. Lewis	7/13/95	[illegible]	7/13/95	8:00

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name LCP CHEMICAL
Project Number 03347-040-001-0113-01
RFW Contact RICH HENRY Phone 908 321-4200

No: 00578

SHEET NO. 1 OF 1

071395

Sample Identification — **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg			
281	CO2 BLANK	TISSUE LAB	X	7/11/95	1	32 OZ JAR/-10°C	✓			

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions

X = 512 grams DRY ICE

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
1 BLANK	[signature]	7/12/95	B [signature]	7/12/95	1450	11 Analyses	B [signature]	7/13/95	[signature]	7/13/95	12

001151

8/94

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name LCP
Project Number 113
RFW Contact Mark Huston Phone (908) 321-4200

No. 00941

SHEET NO. 1 OF 2

071495

Sample Identification

% Moisture
% Lipids
PCB Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg	Hg	Wt (g)	
352	A04342	43	X1	7/13/95	1	Foil / Dry ice	X		13.00	
353	A04341	43					X		13.50	
354	A04473	Confluence					X		16.85	
355	A04474						X		19.05	
356	A04475						X		12.15	
357	A04476						X		12.45	
358	A04477						X		18.45	
359	A04358	Rail #1	X2	7/12/95				X	2.40	
360	A04360	Rail #2	X2	7/12/95				X	1.40	
361	A04478	Rail #1	X3				X		12.70	
362	A04359	Rail #2	X3				X	X pH	10.60	
363	A04499	Rail #1	X4				X		17.35	
364	A04361	Rail #2	X4				X	X pH	10.50	
365	A04345	Rail #1	X5				X		*	
366	A04500	Rail #2	X5				X		*	
367	A04343	Confluence	X1	7/13/95			X		18.15	
368	A04344						X		13.50	
369	A04362	Pit area	X6	7/12/95		8 oz glass / Dry ice		X	*	
370	A04363	Outfall	X1	7/13/95		foil / Dry ice	X		12.95	
371	A04364		X1				X		11.50	

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other; PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge; S - Soil; W - Water; O - Oil; A - Air

Special Instructions

X1 = Whole body fish (Fundulus)

X2 Rail ~~#2~~ feathers
X3 Rail liver
X4 Rail breast muscle
X5 Rail body
X6 Turtle egg shell
* wt not determined in field - determine prior to analysis

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All / analysis	[signature]	7/13/95	Mark Bernd	7/14/95	11:00 AM	Hg / Analysis	[signature]	7/17/95	B. Lewis	7/17/95	1015
						All / Hg Analysis	B. Lewis	7/18/95	J. Patel	7/18/95	1145

00102

REAC, Ec..on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI.. OF CUSTODY RECORD

Project Name LCP
Project Number 113
RFW Contact Mark Huston Phone (908) 321-4242

No 00943

SHEET NO 2 OF 2

071495

Sample Identification | **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	% Moisture % Lipid PCB Hg	Wt		
372	A04365	Outfall	X1	7/13/95	1	Foil/Dry ice	X	11.35		
373	A04366	↓	↓	↓	↓	↓	X	12.05		
374	A04367	↓	↓	↓	↓	↓	X	14.75		

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions

X1 Fundulus tissue (whole fish)

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analysis	Rich K[illegible]	7/13/95	Mark Bernick	7/14/95	11:00am	Hg Analysis	[illegible]	7/17/95	B. Lewis	7/17/95	1015
						Hg Analysis	B. Lewis	7/18/95	[illegible]	7/18/95	11:45 am

00100

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name LCP Chemical Site
Project Number 03347-041-001-0113-01
RFW Contact John Johnson Phone (908) 321-4200

No: 00946

SHEET NO 1 OF 1

Sample Identification							Analyses Requested			
REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	AVS/SEM			
	A03872	F-2	SD	7-13-95	1	32oz glass jar/4°C	✓			
	A03873	C-3								
	A03874	19-20								
	A03875	17-18 *								
	A03876	M-1								
	A03877	36								

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions

* MS/MSD

QA N. Horton

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[illegible signature]	7-13-95	[illegible signature]	7/13/95	9:45						

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name LCP Chemical Site
Project Number 03347-040-011-0113-01
RFW Contact M. Huston Phone 321-4235

No: 00944

SHEET NO 1 OF 1

071795

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg	PCB	% moist.	% lipids
379	A03362	CLAPPER RAIL #3	X1	13 July 1995	1	FOIL / DRY ICE	✓	✓	✓	✓
320	A03363	↓	X2	↓	↓	↓	✓	✓	✓	✓
391	A03364	↓	X3	↓	↓	↓	✓		✓	✓
392	A03365	↓	X4	↓	↓	↓	✓	✓	✓	✓

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other - Tissue SL - Sludge A - Air

Special Instructions
X1 - Carcass
X2 - Breast Muscle
X3 - Feathers
X4 - Liver
Note: All of the samples were from rail birds

QAQC UVC

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

* Priority ON ALL SAMPLES is ① HG, ② % moist, ③ % lipids, ④ PCBs

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSIS	[illegible]	7/17/95	[illegible]	7/15/95	9:45	Hg Analysis	[illegible]	7/17/95	B. [illegible]	7/18/95	1000
						Hg/Analysis	B. [illegible]	7/18/95	[illegible]	7/18/95	1145

8/94

00100

REAC, Ed..on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: SCP CHEMICAL
Project Number: 0113
RFW Contact: JOHN JOHNSON Phone: 908-321-4200

No: 00939

SHEET NO. 1 OF 1

071495

Sample Identification | Hg **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCB			
334	A4455	A3	SD	7-10-95	1	8oz GLASS/4°C	✓			
335	A4456	H1								
336	A4457	C3								
337	A4458	D3								
338	A4459	H3								
339	A4460	H2								
340	A4461	B2								
341	A4462	A2								
342	A4463	E2								
343	A4464	G2								
344	A4465	F3								
345	A4466	B1								
346	A4467	G3								
347	A4468	C2								
348	A4469	A1								
349	A4470	F2								
350	A4471	E3								
351	A4472	B3								

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions
Note: All samples were analyzed for TAL metals and PCBs
QA/QC H. Hudson

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSES	[illegible]	7/14/95	B. Lewis	7/14/95	1000	18/PCB	B. Lewis	7/14/95	Amy Bowman	07 14 95	1130
				7/17/95	1100	18/Hg	[illegible]	7/17/95	[illegible]	07 17 95	1420

FOR 31 #1 8/94

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: LCP Chemical
Project Number: 03347-040-001-0113-01
RFW Contact: Mark Huston Phone: 908 321 4200

No: 00945

SHEET NO 1 OF 1

071795

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCB	Hg	% moisture	% lipids
375	3577A	Reference Area	X	7/14/95	1	Foil / Dry Ice	✓	✓	✓	✓
376	3579A									
377	3580A									
378	2359A									
379	2360A									
380	2361A									
381	2362A									
382	2363A	43								
383	2364A									
384	2365A									
385	2366A									
386	2367A									
387	2368A									
388	2369A									

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions
X = Tissue

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analyses	[signature]	7/14/95	[signature]	7/15/95	745	Hg Analysis	[signature]	7/17/95	B [signature]	7/17/95	1000
						14 Hg Analysis	B [signature]	7/18/95	[signature]	7/18/95	11 43

R 1

REAC, Ed.   , NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI   F CUSTODY RECORD

Project Name LCP Chemical Site
Project Number 03347-010-001-0113-01
RFW Contact John Johnson Phone (908) 321-4200

No. 01199

SHEET NO 1 OF 1

Sample Identification | **Analyses Requested**

	REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Organic Hg			
20	•	B03572	F-2	SP	7-13-95	1	8oz glass jar/4°C	√			
21	•	B03873	C-3								
22	•	B03874	19-20								
23	•	B03875	17-18*								
24	•	B03876	M-1								
25	•	B03877	36								

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions

* MS/MSD

QA M. Hudson

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	[signature]	7-13-95	[signature]	7/15/95	9:45						

E36-0186

001105

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: LCP Chemical Site
Project Number: 03347-040-01-0113-01
RFW Contact: Mark Huston Phone: 908-321-4200

No. 01179

SHEET NO. 1 OF 1

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Total Hg	Inorganic Hg	Organic Hg
	A01674	WWTP Effluent	W	14 Jul 95	1	1 L poly / HNO_3 / 4°C	✓		
	B01674							✓	
	C01674								✓
	A01675	South Seep French Drain					✓		
	B01675							✓	
	C01675								✓
	A01676	North Seep French Drain					✓		
	B01676							✓	
	C01676								✓

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:

Peer Review ________

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
9/analysis	Michael [illegible]	7/14/95	[illegible]	7/15/95	9:45						

8/91

00103

REAC, E... on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: LCP
Project Number: 03347-040-001-0113-01
RFW Contact: Chris Gwinner Phone: (908) 321-4289

No: 01020

SHEET NO. 1 OF 1

071895

Sample Identification							Analyses Requested				
REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCB	Hg	% Moisture	% Lipids	M.(g)
475	04701	BD-1 Carcass	X_1	7/13/95	1	Foil/ziploc 0°C	x	x	x	x	749.
476	04702	BD-1 Liver	X_2	7/13/95	1		x	x	x	x	23.
477	04703	BE-1 (Egg)	X_3				x	x	x	x	6.
478	04704	BE-2 (Egg)	X_3				x	x	x	x	10.
479	04705	BE-3 (Egg)	X_3				x	x	x	x	10
480	04706	BE-4 (Egg)	X_3				x	x	x	x	10
481	04707	BE-5 (Egg)	X_3				x	x	x	x	10
482	04708	BE-6 (Egg)	X_3				x	x	x	x	9.
483	04709	BE-7 (Egg)	X_3				x	x	x	x	9
484	04710	NTD-1 Liver	X_2				x	x	x	x	17.
485	04711	NTD-1 Carcass	X_1				x	x	x	x	581.
486	04712	NTD-2 Liver	X_2				x	x	x	x	13.
487	04713	NTD-3 Carcass	X_1				x	x	x	x	221
488	04714	HD-1	X_4	7/17/95			x	x	x	x	8
489	04715	HD-2	X_4				x	x	x	x	8.
490	04716	HD-3	X_4				x	x	x	x	8.
491	04717	HD-4	X_4				x	x	x	x	8.
492	04718	HD-5	X_4				x	x	x	x	9.

Matrix:

SD - Sediment	DS - Drum Solids	DL - Drum Liquids	X - Other		
PW - Potable Water	GW - Groundwater	SW - Surface Water	SL - Sludge		
S - Soil	W - Water	O - Oil	A - Air		

Special Instructions
X_1 = Carcass (Turtle)
X_2 = Liver (Turtle)
X_3 = Egg (Turtle)
X_4 = Turtle hatchling - whole body.

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	Christopher Gwinner	7/18/95	[illegible]	7/18/95	8:50	Hg Analysis	[illegible]	7/24/95	B. [illegible]	7/24/95	1405
All Analysis	B. [illegible]	7/20/95	[illegible]	7/20/95	2:05pm						

01310

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: LCP
Project Number: 03347-040-001-0113-01
RFW Contact: Chris Gussman Phone: 321-4289

No: 01021

SHEET NO. 1 OF 1

071/95

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg	WEIGHT (g)		
493	Eggshell-1	REAC Biology lab	X_1	7/17/95	1	Foil/Ziploc		0.7		
494	Eggshell-2		X_1					0.7		
495	Eggshell-3		X_1					0.8		
496	Eggshell-4		X_1					0.6		
497	Eggshell-5		X_1					0.6		

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions

X_1 = Eggshell from hatched Diamondback Terrapin

* - analysis cancelled due to insufficient sample volume [illegible] 7/18/95

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
1-5 / Analysis	[signature]	7/18/95	[signature]	7/18/95	8:50	Hg Analysis	[signature]	7/20/95	B. [signature]	7/20/95	1405
All Analysis	B. [signature]	7/20/95	[signature]	7/20/95	2:45pm						

03121

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: LCP CHEMICAL
Project Number: 03347-040-001-0113-01
RFW Contact: RICH HENRY Phone: 908-321-4200

No: 00625

SHEET NO. 1 OF 1

072095

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg			
580	CO_2 BLANK	TISSUE LAB	X	7/14/95	1	32 oz. JAR / -10°C	X			

7/20/95

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions

X = 506 g DRY ICE

DRY ICE USED FOR HOMOGENIZATION OF SAMPLES 04701, 04702, 04710 - 04718 ON COC 01020

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
1 Blank	[illegible]	7/20/95	B. [illegible]	7/20/95	1605	1 / Analysis	[illegible]	7/2?/9?	[illegible]	7/14/95	1605

031...

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name LCP/EPA
Project Number 03347-010-001-0113-01
RFW Contact Chris Grossman Phone 321-4284

No: 01024

SHEET NO 1 OF 1

072195

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg	PCB	Weight (grams)	
704	LCPNB9501A	RAIL 4	X3	7/14/95	1	Teflon Ziploc / 0°C				
705	LCPNB9501B	RAIL 4	X2					x	10.6	
706	LCPNB9501D	RAIL 4	X1					x	194.7	
707	LCPNB9501F	RAIL 4	X4					x	11.8	
708	LCPNB9502A	RAIL 5	X2					x	9.8	
709	LCPNB9502B	RAIL 5	X3							
710	LCPNB9502D	RAIL 5	X1					x	138.1	
711	LCPNB9502F	RAIL 5	X4					x	11.2	
712	LCPSM9501A	RAIL 6	X2					x	6.8	
713	LCPSM9501B	RAIL 6	X3							
714	LCPSM9501D	RAIL 6	X1					x	181.4	
715	LCPSM9501F	RAIL 6	X4					x	11.0	
716	LCPSM9502B	RAIL 7	X2					x	10.5	
717	LCPSM9502D	RAIL 7	X1					x	230.1	
718	LCPSM9502E	RAIL 7	X3							
719	LCPSM9502F	RAIL 7	X4					x	12.5	

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

Special Instructions
X_1 = Rail Carcass
X_2 = Rail Liver
X_3 = Rail Feathers
X_4 = Rail Muscle

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
16 (All)/Analysis	[signature]	7/21/95	[signature]	7/21/95	1410	16/Hg Analysis	[signature]	7/24/95	B. Lewis	7/24/95	1600
16/Analysis	B. Lewis	7/24/95	[signature]	7/25/95	9:15						

001[illegible]

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: LCP CHEMICAL
Project Number: 03347-040-001-0113-01
RFW Contact: Mark Huston Phone: 321-4200

No: 00580

SHEET NO. 1 OF 1

072495

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg				
770	071895-01	TISSUE LAB	X	7/18/95	1	32 oz CLEAR/ICE	✓				

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions
X = 5029 DRY ICE BLANK

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
1 Hg Analysis	[illegible]	7/24/95	B. [illegible]	7/24/95	7/24/95	1 Analysis	B. [illegible]	7/24/95	[illegible]	7/25/95	9:15

REAC, E   on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI OF CUSTODY RECORD

Project Name LCP Chem
Project Number -0113
RFW Contact Mark Huston   Phone 908-321-4285

No 00583

SHEET NO 1 OF 1

092695

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg			
343	092195-CO2	Blk	X	9/21/95	1	32 oz JAR / -20°C	✓			

ak 9/26/95

Matrix:
SD - Sediment   PW - Potable Water   S - Soil
DS - Drum Solids   GW - Groundwater   W - Water
DL - Drum Liquids   SW - Surface Water   O - Oil
X - Other   SL - Sludge   A - Air

Special Instructions
X = CO2 (dry ice) Blank (500 g)

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All Analysis	[signature]	9/26/95	B Lewis	9/26/95	8:45	1/Analysis	B Lewis	9/26/95	[signature]	9/26/95	3:50

0013

REAC, n, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHA)F CUSTODY RECORD

Project Name LCP CHEMICAL
Project Number 03347-040-001-0113-01
RFW Contact ~~MARK HUSTON~~ J. Johnson
Phone 908 321-4200

No: 00579

SHEET NO. 1 OF 1

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	ORGANO-Hg			
19LCP 35	A04500	RAIL #2	X_1	7/12/95	1	2oz JAR/-10°C				
36	A04345	RAIL #1	X_1	7/12/95	1					
37	A04477	CONFLUENCE	X_2	7/13/95	1	4oz glass/-10°C				
38	4410	DS PURVIS	X_3	7/8/95	1					
39	2366A	REFERENCE AREA	X_6	7/14/95	1	4oz glass/-10°C				
40	04701	BD-1	X_4	7/15/95	1	2oz glass/-10°C				
41	04702	BD-1	X_5	7/15/95	1	4oz glass/-10°C				

E340192

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
X_1 = RAIL HP AL. BODY
X_2 = WHOLE BODY FISH
X_3 = EDIBLE FISH
X_4 = TURTLE CARCASS
X_5 = TURTLE LIVER
X_6 = TISSUE

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY # 01020, 00941, 00934, 00945

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
Analysis	[signature]	7/21/95	B Lewis	7/21/95	0900	7/Analysis	B Lewis	7/21/95	[signature]	7/25/95	1130

REAC, Ed. on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name LCP CHEMICAL
Project Number 03347-040-001-0113-01
RFW Contact HUSTON Phone 321-4200

No. 00581

SHEET NO 1 OF 1

08 28 95

Sample Identification | **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg			
724	A00553	LCP/Biolab	X	8/25/95	1	2 oz glass/4°C	X			
725	A00554	↓	↓	↓	↓	↓	X			
726	A00555	↓	↓	↓	↓	↓	X			
727	A00556	↓	↓	↓	↓	↓	X			
728	A00557	↓	↓	↓	↓	↓	X			

8/28/95

Matrix:

SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

X = Turtle Eggs

Special Instructions

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
5/Analysis	[signature]	8/28/95	[signature]	8/29/95	1455	5/Analysis	[signature]	8/29/95	Colleen Egan	8/30/95	3:15

0012

REAC, ...on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CH... OF CUSTODY RECORD

Project Name: LCP
Project Number: 03347-040-001-0113-01
RFW Contact: Rich Henry Phone: 321-4242

No: 01022

SHEET NO. 1 OF 1

Sample Identification							Analyses Requested			
REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Total Hg	Elemental Hg	Organic Hg	
49LCP 42	A04719	Storm Drain	W	2 Aug 95	1	1l poly / HCl HNO3	X			
43	B04719	Storm Drain	W	2 Aug 95	1	1l poly / HCl HNO3		X		
44	C04719	Storm Drain	W	2 Aug 95	1	1l poly / 4°C			X	

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
3	[illegible signature]	8/2/95	B. Lewa	8/3/95	10:15	3/Analysis	B. Lewa	8/3/95	C. Andrick BATTELLE MSL	8/4/95	11:20

3640189

00119

REAC, E[illegible]on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI[illegible] JF CUSTODY RECORD

Project Name: LCP Chemical
Project Number: 03347-040-001-0113-01
RFW Contact: John Johnson, Mark Huston
Phone: (908) 321-4200

No: 01100

SHEET NO 1 OF 1

08/795

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg			
363	03872	F2	X	7/13/95		30ml vial/none	X			
364	03873-1	C3								
365	03874-3	19-20								
366	03875	17-18								
367	03876-6	M-1								
368	03877-7	36								
369	03876-5	M-1								
370	03874-4	19-20								
371	03873-2	C3								
372	03877-8	36								

CLTCO

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions: X = sediment extract

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY # 00946

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
10/ Hg	B. Lewis	7/17/95	B. Lewis	7/17/95	1410	10/ Analysis	B. Lewis	7/17/95	[illegible]	7/17/95	14:50
10/ Hydrolysis	Michael [illegible]	7/17/95									

8/01

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: LCP CHEMICAL, GA
Project Number: 03347-040-001-0113
RFW Contact: M. HUSTON Phone: 321-4285

No: 00872

SHEET NO 1 OF 2

081595

Sample Identification							Analyses Requested			
REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg	PCBs	% Moist	% Lipids
408	A03994	LCPTC9503	X1*	8/15/95	1	~~Zip lock~~ 4°C	X	X	X	X
409	A04880	LCPTC9503	X3*	8/15/95	1	~~Aluminum foil~~	X	X	X	X
410	A04881	LCPTC9503	X2**	8/15/95	1	SEE BELOW	X			
411	A04882	LCPTC9503	X4*	8/15/95	1		X	X	X	X
412	A03991	LCPTC9506	X1	8/15/95	1		X	X	X	X
413	A04888	LCPTC9506	X2	8/15/95	1		X			
414	A04887	LCPTC9506	X3	8/15/95	1		X	X	X	X
415	A04886	LCPTC9506	X4	8/15/95	1		X	X	X	X
416	A03990	LCPTC9504	X1	8/15/95	1		X	X	X	X
417	A04885	LCPTC9504	X3	8/15/95	1		X	X	X	X
418	A04884	LCPTC9504	X2	8/15/95	1		X			
419	A04883	LCPTC9504	X4	8/15/95	1		X	X	X	X
420	A03989	LCPTC9505	X1	8/15/95	1		X	X	X	X
421	A03999	LCPTC9505	X2	8/15/95	1		X			
422	A03998	LCPTC9505	X3	8/15/95	1		X	X	X	X
423	A03997	LCPTC9505	X4	8/15/95	1		X	X	X	X
424	A03996	LCPTC9501	X1	8/15/95	1		X	X	X	X
425	A04895	LCPTC9501	X2	8/15/95	1		X			
426	A04897	LCPTC9501	X3	8/15/95	1		X	X	X	X
427	A04896	LCPTC9501	X4	8/15/95	1		X	X	X	X

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

* = CARCASS, BREAST MUSCLE, & LIVER IN 8 OZ GLASS JAR AT 0°C
** = FEATHERS IN FOIL/BAG AT 0°C
NOTE = FEATHERS FOR Hg ANALYSIS ONLY

Special Instructions
X1 = CLAPPER RAIL CARCASS
X2 = FEATHERS
X3 = BREAST MUSCLE
X4 = LIVER

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all analyses	Mark Huston	8/17/95	[signature]	8/17/95	1005	20 Hg analysis	[signature]	8/21/95	[signature]	8/21/95	0930
			Mark Berne	8/17/95	16:00				[signature]	8/21/95	0935

00120

REAC, Ec son, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI. OF CUSTODY RECORD

Project Name LCP CHEMICAL, GA
Project Number 03347-040-001-0113
RFW Contact [illegible] Phone 321-4285

No 00873

SHEET NO 2 OF 2

01175

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles BIRDS	Container/Preservative	Hg	PCBs	% MOISTURE	% LIPIDS
425	A03995	LCP TC9502	X_1*	8/15/95	1	~~ALUMINUM FOIL~~	X	X	X	X
427	A04894	CPTC 9502	X_3*	8/15/95	1	~~AND ZIP LOCK/4°C~~	X	X	X	X
430	A04893	LCPTC9502	X_4*	8/15/95	1	SEE BELOW	X	X	X	X
431	A04892	LCPTC9502	X_2**	8/15/95	1		X			
432	A03993	LCPTC 9507	X_1	8/15/95	1		X	X	X	X
433	A04891	LCPTC9507	X_3*	8/15/95	1		X	X	X	X
434	A04890	LCPTC9507	X_2**	8/15/95	1		X	~~X~~	~~X~~	~~X~~
435	A04889	LCPTC9507	X_4	8/15/95	1		X	X	X	X

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

* - CARCASS, MUSCLE, & LIVER IN 2 OZ GLASS JAR AT 0°C
** - FEATHERS IN FOIL/ZIPLOCK AT 0°C
NOTE: FEATHERS FOR Hg ONLY

Special Instructions
X_1 = CLAPPER RAIL CARCASS
X_2 = FEATHERS
X_3 = BREAST MUSCLE
X_4 = LIVER
Note Reac # 434 was feathers analyzed for Hg only

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/analyses	Mark Huston	8/17/95	[illegible]	4/1/95	1005	[illegible]	[illegible]	3/[illegible]	[illegible]	1/22/[illegible]	[illegible]
			Mark Bunk	4/1/95	16:00	[illegible]	[illegible]	3/[illegible]	[illegible]	1/22/[illegible]	[illegible]
			[illegible]	8/22/95	0915						

001[illegible]1

8/94

REAC, Ed...on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: LCP Chemical, GA
Project Number: 03347-040-001-0113-01
RFW Contact: Huston Phone: 321-4200

No: 00877

SHEET NO 1 OF 1

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCB	Hg	% moisture	% lipids
	A00553	LCP/Marsh	X	8/23/95	1	4oz glass jar/4°C	X	X	X	X
	A00554						X	X	X	X
	A00555						X	X	X	X
	A00556						X	X	X	X
	A00557						X	X	X	X

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other egg turtle eggs SL - Sludge A - Air

Special Instructions

turtle DD4

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
5 eggs/Analysis	George Prater	8/25/95	Mark Bernick	8/25/95	1440						

0312

8/91

REAC, Ed. on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAI OF CUSTODY RECORD

Project Name LCP chemicals, GA
Project Number 03347-040-001-0113-01
RFW Contact M. Huston Phone 321-4285

No. 01099

SHEET NO 1 OF 1

012295

Sample Identification **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg			
475 479	CO2 Blank	Tissue Lab	X	3/23/95	1	32oz / -10°C	X			

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
x = dry ice
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
Blank/Hg analysis	[illegible]	3/23/95	B Lewis	3/27/95	0920	1 Analysis	B Lewis	3/27/95	[illegible]	3/27/95	11:45

8/94

0012

WESTON
MANAGERS DESIGNERS CONSULTANTS

Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
908-321-4200 • Fax 908-494-4021

Manhattan College
Manhattan College Parkway
Riverdale, NY 10471

Attn: Dr. John Mahony

July 12, 1995

Project # 3347-040-001-0113, LCP Chemical

As per Weston REAC Purchase Order number 08-47214, dated 07/12/95,please analyze samples according to the following parameters:

Analysis/Method	Matrix	# of samples
AVS/SEM /See attached method	12	soil
Data package as per attached Deliverables Requirements		

Samples are expected to arrive at your laboratory between July 12-13 1995. All applicable QA/QC(MS/MSD) analysis as per method, will be performed on our sample matrix. The complete data package due 15 business days after receipt of last sample. The complete data package must include all items on the deliverables checklist.

Please submit all reports and technical questions concerning this project to **John Johnson at (908) 321-4248** or fax to (908) 494-4020. Any contractual question, please call Cindy Ritchey at (908) 321-4296. Thank you

Sincerely,

George Armstrong
Data Validation and Report Writing Group Leader
Roy F. Weston, Inc. /REAC Project

GA:cs Attachments

cc.	R. Singhvi	V. Kansal	C. Ritchey
	M. Sprenger	Subcontracting File	M. Huston
	0113\non\mem\9507\sub\0113con1	B. Lewan	G. Armstrong

Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
908-321-4200 • Fax 908-494-4021

Aqua Survey Inc.
499 Point Breeze Road
Flemington, NJ 08822

Attn: Jim Todd

July 18, 1995

Project # 3347-040-001-0113, LCP Chemical

As per Weston REAC Purchase Order number 08-47709, dated 07/14/95, please analyze samples according to the following parameters:

Analysis/Method	Matrix	# of samples
Organo-mercury/ See attached method	Sediment Tissue Water	12 14 3
Total Hg/SW-846-7471	Sediment Water	6 3
Data package as per attached Deliverables Requirements		

All samples except the tissue samples are expected to arrive at Battelle's laboratory on July 14, 1995. The tissue samples will be processed by REAC and an aliquot will be sent to Battelle the week of July 17, 1995. All applicable QA/QC (MS/MSD) analysis as per method, will be performed on each of our sample matrix. The complete data package is due 21 business days after receipt of last sample. The complete data package must include all items on the deliverables checklist.

Please submit all reports and technical questions concerning this project to **John Johnson at (908) 321-4248** or fax to (908) 494-4020. Any contractual question, please call Cindy Ritchey at (908) 321-4296. Thank you

Sincerely,

George Armstrong
Data Validation and Report Writing Group Leader
Roy F. Weston, Inc. /REAC Project

GA:cs Attachments

cc. R. Singhvi
M. Sprenger
0113\non\mem\9507\sub\0113con3
V. Kansal
Subcontracting File
B. Lewan
C. Ritchey
M. Huston
G. Armstrong

Appendix G
Analytical Report for Samples Collected in October 1995
LCP site
Brunswick, GA
April 1997

ANALYTICAL REPORT

Prepared by
Roy F. Weston, Inc.

LCP Chemical Site
Brunswick, GA

January, 1996

EPA Work Assignment No. 0-113
WESTON Work Order No. 03347-040-001-0113-01
EPA Contract No. 68-C4-0022

Submitted to
M. Sprenger
EPA-ERT

[signature] 1/30/96
M. Huston — Date
Task Leader

[signature] 1/31/96
V. Kansal — Date
Analytical Section Leader

[signature] 1/31/96
F. Gilardi — Date
Project Manager

Analysis by:
REAC
SWRI
ALTA
Integrated

Prepared by:
G. Karustis

Reviewed by:
M. Barkley

Table of Contents

Section II

Appendices will be furnished on request.

INTRODUCTION

REAC, in response to ERT WA # 0-113, provided analytical support for sediment, carbon dioxide and tissue samples collected at the LCP Chemical Site in Brunswick, GA. This support involved the analysis of sediment and tissue samples and the subcontracted analyses of sediment samples as described in the following table. The support also included the operation of a High Hazard Laboratory, QA/QC, data review and the preparation of a report summarizing the analytical methods, results, and the QA/QC results.

The samples were treated with procedures consistent with those described in SOP #1008 and are summarized in the following table:

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
00189	2	10/20/95	12/11/95	Extract	PCB	REAC
00584	1	10/20/95	10/23/95	Carbon Dioxide	Mercury	REAC
01091	4	7/10/95	9/28/95	Sediment	Dioxin	SWRI
01091	2	7/13/95	9/28/95	Sediment	Dioxin	SWRI
09800	1	10/23/95	10/24/95	Carbon Dioxide	Mercury	REAC
0113-001	7	10/16/95	10/18/95	Sediment	Mercury	Integrated
0113-001	13	10/17/95	10/18/95	Sediment	Mercury	Integrated
0113-002	4	10/17/95	10/18/95	Sediment	Mercury	Integrated
0113-003	7	10/16/95	10/18/95	Sediment	PCB	HHL**
0113-003	13	10/17/95	10/18/95	Sediment	PCB	HHL**
0113-004	4	10/17/95	10/18/95	Sediment	PCB	HHL**
0113-006	7	10/16/95	10/19/95	Sediment	PCB	HHL**
0113-008	1	10/18/95	10/20/95	Sediment	Dioxin/Furan	ALTA
0113-008	2	10/18/95	10/20/95	Soil	Dioxin/Furan	ALTA

* COC # denotes Chain of Custody number

** HHL denotes High Hazard Laboratory

The sample table is continued on the next page

Sample Table (Cont)

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
0113-111	7	10/18/95	10/20/95	Marsh Grass	Mercury, PCB % Moisture, % Lipids	REAC
0113-111	7	10/18/95	10/20/95	Brown Shrimp	Mercury, PCB % Moisture, % Lipids	REAC
0113-111	6	10/18/95	10/20/95	BCCrab	Mercury, PCB % Moisture, % Lipids	REAC
0113-112	1	10/18/95	10/20/95	BCCrab	Mercury, PCB % Moisture, % Lipids	REAC
0113-113	10	10/18/95	10/20/95	Sediment	Mercury	Integrated
0113-113	1	10/18/95	10/20/95	Sediment	TAL Metals, TPH, BNA	Integrated
0113-113	2	10/18/95	10/20/95	Soil	TAL Metals, TPH, BNA	Integrated
0113-113	1	10/18/95	10/20/95	Sediment	TAL Metals, BNA	Integrated
0113-114	1	10/18/95	10/20/95	Sediment	TAL Metals, BNA	Integrated
0113-114	3	10/18/95	10/20/95	Sediment	Mercury	Integrated
0113-114	1	10/18/95	10/20/95	Sediment	TAL Metals, TPH, BNA	Integrated
0113-115	2	10/18/95	10/20/95	Soil	PCB	HHL**
0113-115	12	10/18/95	10/20/95	Sediment	PCB	HHL**
0113-116	14	10/18/95	10/20/95	Sediment	PCB	HHL***

* COC # denotes Chain of Custody number

** HHL denotes High Hazard Laboratory

The sample table is continued on the next page

Sample Table (Cont)

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
0113-117	3	10/18/95	10/20/95	Sediment	TAL Metals, BNA	Integrated
0113-117	17	10/18/95	10/20/95	Sediment	Mercury	Integrated
0113-118	5	10/18/95	10/20/95	Sediment	TAL Metals, BNA	Integrated
0113-119	9	10/18/95	10/20/95	Sediment	PCB	HHL**
0113-120	4	10/18/95	10/20/95	Sediment	TAL Metals, BNA	Integrated
0113-120	4	10/18/95	10/20/95	Sediment	Mercury	Integrated
0113-120	5	10/19/95	10/20/95	Sediment	Mercury	Integrated
0113-124	15	10/19/95	10/23/95	Sediment	PCB	HHL***
0113-126	1	10/20/95	10/23/95	Sediment	PCB	HHL***
0113-127	7	10/19/95	10/21/95	Spot	Archive	NA
0113-127	7	10/19/95	10/21/95	Brown Shrimp	Mercury, PCB % Moisture, % Lipids	REAC
0113-127	1	10/19/95	10/21/95	BCCrab	Mercury, PCB % Moisture, % Lipids	REAC
0113-127	4	10/18/95	10/21/95	BCCrab	Mercury, PCB % Moisture, % Lipids	REAC
0113-128	2	10/18/95	10/21/95	BCCrab	Mercury, PCB % Moisture, % Lipids	REAC
0113-129	7	10/19/95	10/23/95	Sediment	Mercury	Integrated
0113-129	5	10/19/95	10/23/95	Sediment	TAL Metals, BNA	Integrated

* COC # denotes Chain of Custody number

** HHL denotes High Hazard Laboratory

Sample Table (Cont)

COC #*	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
0113-130	3	10/19/95	10/23/95	Sediment	Mercury	Integrated
0113-130	1	10/20/95	10/23/95	Sediment	Mercury	Integrated
0113-131	3	10/18/95	10/21/95	Fiddler Crab	Mercury, PCB % Moisture, % Lipids	REAC
0113-131	13	10/19/95	10/21/95	Fiddler Crab	Mercury, PCB % Moisture, % Lipids	REAC
0113-132	2	10/20/95	10/21/95	Whole Body	Mercury, PCB % Moisture, % Lipids	SWRI

* COC # denotes Chain of Custody number

CASE NARRATIVE

The Task Leader has requested, that, in order to be consistent with previous reports, matrices listed on the chains of custody as "marsh grass", "BC crabs" and "whole body" be reported as "spartina grass", "Blue Claw Crabs" and "Whole Body Rat", respectively.

Please refer to the communications section for samples and analytical requests not on the chains of custody

BNA Package E 511

The 14 day holding time was exceeded for samples 100-SED, 106-SED, 111-SED, 112-SED 113-SED, 115-SED, 116-SED, 117-SED, 118-SED, 119-SED, 120-SED, 121-SED, 113077 and 113081. The results for these samples should be regarded as estimated.

The Task Leader requested BNA analyses after the samples were received by the laboratory

Aroclor 1268 Package E 458

The data were examined and were found to be acceptable. Seven samples on chain of custody 0113-003 were not received

Aroclor 1268 Package E 482

The end of sequence continuing calibration check standard run on 10/30/95 exceeded the acceptable QC limits for the following peaks in Aroclor 1268: Peak 1: 39%, Peak 2: 37%, Peak 3: 35%, Peak 4: 36% and Peak 5: 34%. The data are not affected because no samples were quantified by these continuing calibration check standards.

The end of sequence continuing calibration check standard run on 10/30/95 exceeded the acceptable QC limits for the following peaks in Aroclor 1268: Peak 1: 52%, Peak 2: 55%, Peak 3: 52%, Peak 4: 47% and Peak 5: 51%. The data are not affected because no samples were quantified by these continuing calibration check standards.

The end of sequence continuing calibration check standard run on 10/31/95 exceeded the acceptable QC limits for the following peaks in Aroclor 1268: Peak 1: 39%, Peak 2: 41%, Peak 3: 38%, Peak 4: 36% and Peak 5: 39%. The data are not affected because no samples were quantified by these continuing calibration check standards.

The end of sequence continuing calibration check standard run on 11/6/95 exceeded the acceptable QC limits for the following peaks in Aroclor 1260: Peak 4: 28%. The data are not affected because no samples were quantified by these continuing calibration check standards.

The end of sequence continuing calibration check standard run on 11/6/95 exceeded the acceptable QC limits for the following peaks in Aroclor 1268: Peak 1: 28%, Peak 2: 30%, Peak 3: 27%, Peak 4: 27% and Peak 5: 27%. The data are not affected because no samples were quantified by these continuing calibration check standards.

The end of sequence continuing calibration check standard run on 11/7/95 exceeded the acceptable QC limits for the following peaks in Aroclor 1268: Peak 1: 50%, Peak 2: 51%, Peak 3: 52%, Peak 4: 46% and Peak 5: 55%. The data are not affected because no samples were quantified by these continuing calibration check standards.

The end of sequence continuing calibration check standard run on 11/7/95 exceeded the acceptable QC limits for the following peaks in Aroclor 1268: Peak 1: 38%, Peak 2: 39%, Peak 3: 39%, Peak 4: 39% and Peak 5: 35%. The data are not affected because no samples were quantified by these continuing calibration check standards

The end of sequence continuing calibration check standard run on 10/31/95 exceeded the acceptable QC limits for the following peaks in Aroclor 1268: Peak 1: 41%, Peak 2: 41%, Peak 3: 42% Peak 4: 38% and Peak 5: 39% The data are not affected because no samples were quantified by these continuing calibration check standards

The percent recoveries for the surrogate decachlorobiphenyl were not calculated because it co-eluted with the last peak in aroclor 1268

Samples A 113149 and A 113150 on chain of custody 0113-131 were lost during the GPC cleanup

The results for the method blank and samples 102195, A 113056 MS, A 113136 MS, A 113136 MSD, A 113154 MSD, A 113159 MS, A 113159 MSD, A 113052, A 113053, A 113054, A 113055, A 113056, A 113057, A 113058, A 113059, A 113060, A 113061, A 113062, A 113063, A 113064, A 113065, A 113066, A 113068 and A 113071 should be regarded as estimated due to surrogates outside of QC limits

PCB, Mercury, Moisture and Lipids Package E 495

The percent recoveries of the surrogate decachlorobiphenyl were not calculated for the samples 113200 and 113201 because the interfering peaks coeluted with this compound in the samples.

Because the 7 day holding time for the extraction for PCB analysis was exceeded, the data should be regarded as estimated.

Metals Package E 465

The data were examined and were found to be acceptable.

Metals Package E 510

The results for aluminum in samples C 113104, C 113106, C 113108 and C 113110 should be regarded as estimated because the two continuing calibration verification runs exceeded the acceptable QC limit.

Metals Package E 520

The data were examined and were found to be acceptable.

Total Petroleum Hydrocarbon Package E 507

The data were examined and were found to be acceptable.

Total Petroleum Hydrocarbon Package E 518

The data were examined and were found to be acceptable.

Dioxin Package E 457

The analyses of all samples exceeded the 30 day holding time. The results of the analysis for samples 113035, 113036 and 113037 should be regarded as estimated.

Dioxin Package E 463

The method blank contained 1.3 pg/g OCDF. Each sample contained more than five times this concentration of OCDF, the data are not affected.

Aroclor 1268 in Tissue Package F 40

The original analysis of the samples did not include Aroclor 1268. The samples were returned to REAC for re-analysis, including analysis for Aroclor 1268.

The samples were extracted 5 days beyond the holding time and analyzed 9 days beyond the holding time. The results for samples 113200 and 113201 should be regarded as estimated.

The 25% difference QC limit was exceeded for the end of sequence calibration check standard. The data are not affected.

All surrogate recoveries were below the advisory QC limits. The data should be regarded as estimated.

Compound identification was made based on patter recognition from one column only. No confirmation column was used. The data are not affected.

SUMMARY of ABBREVIATIONS

B	The analyte was found in the blank
BFB	Bromofluorobenzene
BPQL	Below the Practical Quantitation Limit
C	Centigrade
D	(Surrogate Table) this value is from a diluted sample and was not calculated
	(Result Table) this result was obtained from a diluted sample
CLP	Contract Laboratory Protocol
COC	Chain of Custody
CONC	Concentration
CRDL	Contract Required Detection Limit
DFTPP	Decafluorotriphenylphosphine
DL	Detection Limit
E	The value is greater than the highest linear standard and is estimated
EMPC	Estimated maximum possible concentration
J	The value is below the method detection limit and is estimated
HHL	High Hazard Laboratory, Brunswick, GA
IDL	Instrument Detection Limit
ISTD	Internal STanDard
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MI	Matrix Interference
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular Weight
NA	either Not Applicable or Not Available
NC	Not Calculated
NR	Not Requested
NS	Not Spiked
% D	Percent Difference
% REC	Percent Recovery
PQL	Practical Quantitation Limit
PPBV	Parts per billion by volume
QL	Quantitation Limit
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
SIM	Selected Ion Mode
U	Denotes not detected

m^3	cubic meter	kg	kilogram
l(L)	liter	g	gram
dl	deciliter	cg	centigram
ml	milliliter	mg	milligram
ul	microliter	ug	microgram
		ng	nanogram
		pg	picogram

* denotes a value that exceeds the acceptable QC limit

Abbreviations that are specific to a particular table are explained in footnotes on that table

Revision 3/10/95

0113.DEL\AR\9601\REPORT

Analytical Procedure for BNA in Soil

The subcontract laboratory determined the concentrations of BNA compounds in the samples by serially extracting into methylene chloride using sonication and analyzing using USEPA Method 8270. The results of the analysis are listed in Table 1.1.

Analytical Procedure for PCBs in Soil
(HHL)

Extraction Procedure

Ten grams of sample was mixed with ten grams of anhydrous sodium sulfate until a sandy consistency was obtained. The sample was then spiked with a surrogate solution consisting of dibutyl chlorendate and shaker extracted five times with 30 ml portions of 40:60 acetone:methylene chloride (v/v). Prior to analysis, a 1 ml aliquot was analyzed, and, if no Aroclor peaks were detected, a 15 ml portion of the combined extract was reduced in volume to 1 ml and re-analyzed. Prior to the re-analysis the aliquot was spiked with an internal standard solution containing chrysene-d_{12}. The extract was analyzed by GC/MS using the conditions described below.

Analytical Procedure

An HP 5971A Mass Selective Detector equipped with a 5890 Series II GC, a 7673A autosampler and controlled by an HP-Chem Station/Window/DOS 5.0 software driven IBM compatible computer was used to analyze the samples.

The instrument conditions were:

Column	Restek Rtx-5 (crossbonded SE-54) 30 meter x 0.25mm ID, 0.50 µm film thickness
Injection Temperature	300° C
Transfer Temperature	300° C
Temperature Program	150°C for 0.5 min 15° C/min to 305° C Hold for 15 min.
Splitless Injection	Split time = 0.88 min
Injection Volume	2 µl
EM Voltage	1800 EMV
Column Flow	0.95 ml/min EPS enabled

The GC/MS system was calibrated using 6 standards at 0.05, 0.10, 0.50, 1.0, 10 and 50 µg/ml. Before analysis each day, the system was tuned with 50 ng decafluorotriphenylphosphine (DFTPP) and passed a continuing calibration check when analyzing a 1 µg/ml standard mixture in which the responses were evaluated by comparison to the average response of the calibration curve.

The PCB results, based on dry weight, are listed in Table 1.2. The concentration of the detected compounds was calculated using the following equation:

$$C_x = \frac{DF x A_x x I_{is} x V_t}{A_{is} x RF_{ave} x V_i x W x D}$$

where

DF	=	Dilution Factor
RF_{ave}	=	Average Response Factor (unitless)
A_x	=	Area of analyte
A_{is}	=	Area of internal standard
I_{is}	=	Mass of internal standard (ng)
C_x	=	Concentration of analyte (µg/Kg)
V_t	=	Volume of extract (µl)
V_i	=	Volume of extract injected (µl)
W	=	Weight of sample (g)
D	=	Decimal per cent solids

The average Response Factor is used when a sample is associated with an initial calibration curve. The Response Factor is used when a sample is associated with a continuing calibration.

Response Factor calculation

The response factor (RF) for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_c \ x \ I_{is}}{A_{is} \ x \ I_c}$$

where

RF	=	Response factor for a specific analyte
A_c	=	Area of the analyte in the standard
A_{is}	=	Area of the internal standard in the standard
I_c	=	Mass of the analyte in the standard
I_{is}	=	Mass of the internal standard in the standard

$$RF_{ave} = \frac{RF_1 + ... + RF_n}{n}$$

and

n = number of Samples

Analytical Procedure for PCBs in Tissue

Extraction Procedure

After homogenization, an aliquot of tissue sample was mixed with 30 grams of sodium sulfate, spiked with a surrogate solution consisting of tetrachloro-m-xylene and decachlorobiphenyl, Soxhlet extracted for 16 hours with 250 ml methylene chloride, cleaned on GPC, solvent exchanged to hexane and concentrated to 1 ml. Additional florisil and acid cleanups were performed.

Gas Chromatographic Analysis

~~The extract was analyzed for PCBs using simultaneous dual column injections~~. The analysis was done on an HP 5890 GC/ECD system, equipped with an HP 7673A automatic sampler, and controlled with an HP-CHEM STATION. The following conditions were employed:

First Column	DB-608, 30 meter, 0.53mm fused silica capillary, 0.83 um film thickness
Injector Temperature	250° C
Detector Temperature	325° C
Temperature Program	150°C for 1 minute 7°C/min to 265°C 18 min at 265°
Second Column	DB-608, 30 meter, 0.53mm fused silica capillary, 0.83 um film thickness
Injector Temperature	250° C
Detector Temperature	325° C
Temperature Program	150° C for 1 minute 7°C/min to 265°C 18 min at 265°

The gas chromatographs were calibrated using 5 PCB standards at 0.1, 0.25, 0.5, 1, and 2 ug/mL. The results from each mixture were used to calculate the response factor (RF) of each analyte and the average Response Factor was used to calculate the concentration of PCB in the sample. Quantification was based on the DB-608 column (signal 1 and signal 2).

The results are listed in Table 1.3 through 1.6 as follows:

Table 1.3 Results of the Analysis for Aroclor 1268 in Spartina Grass
Table 1.4 Results of the Analysis for Aroclor 1268 in Brown Shrimp
Table 1.5 Results of the Analysis for Aroclor 1268 in Blue Claw Crabs
Table 1.6 Results of the Analysis for Aroclor 1268 in Fiddler Crabs
Table 1.8 Results of the Analysis for PCBs in Tissue Blanks

The results were calculated by using the following formulae:

$$C_{mg/Kg} = \frac{A \times V_f \times DF}{RF_{ave} \times V \times W_s \times D}$$

where

A	= Area or Peak Height
V_f	= Volume of Extract (ml)
DF	= Dilution Factor
RF_{ave}	= Average Response Factor
V	= Volume injected (ul)
W	= Weight of Sample (g)
D	= Decimal percent solids

where

$$RF = \frac{A}{\text{total pg injected}}$$

$$RF_{ave} = \frac{RF_1 + \ldots + RF_n}{n}$$

and

A = Area of Peak
n = number of samples

Revision of 7/11/94

Analytical Procedure for Aroclor 1268 in Whole Body Rat Extracts

Gas Chromatographic Analysis

The extract was analyzed for Aroclor 1268 using a single DB-608 column injection. The analysis was done on an HP 5890 GC/ECD system, equipped with an HP 7673A automatic sampler, and controlled with an HP-CHEM STATION. The following conditions were employed:

First Column	DB-608, 30 meter, 0.53mm fused silica capillary, 0.83 um film thickness
Injector Temperature	250° C
Detector Temperature	325° C
Temperature Program	150°C for 1 minute 7°C/min to 265°C 18 min at 265°

The gas chromatograph was calibrated using 5 Aroclor 1268 standards at 0.1, 0.2, 0.5, 1, and 2 mg/L. The results from each mixture were used to calculate the response factor (RF) of each analyte and the average Response Factor was used to calculate the concentration of Aroclor 1268 in the sample. Quantification was based on the DB-608 column.

The results are listed in Table 1.7.

The results were calculated by using the following formulae:

$$C_{ug/Kg} = \frac{A \times V_f \times DF}{RF_{ave} \times V \times W_s}$$

where

A	= Area or Peak Height
V_f	= Volume of Extract (ml)
DF	= Dilution Factor
RF_{ave}	= Average Response Factor
V	= Volume injected (ul)
W	= Weight of Sample (g)

where

$$RF = \frac{A}{\text{total pg injected}}$$

$$RF_{ave} = \frac{RF_1 + \ldots + RF_n}{n}$$

and

A = Area of Peak
n = number of samples

Revision of 7/11/94

Analytical Procedure for PCBs in Whole Body Rat

The subcontract laboratory determined the concentrations of PCBs in the samples using USEPA Method 8080. The results of the analysis are listed in Table 1.7.

Analytical Procedure for Metals in Sediment

The subcontract laboratory determined the concentrations of metals in the samples by extracting them according to USEPA procedure 3050 and analyzing them using methods derived from 7000 series "EPA Methods for Evaluating Solid Wastes". The results of the metals analysis are listed in Table 1.10. The results of the mercury analysis are listed in Table 1.11.

Analytical Procedure for Mercury in Tissues

One-half to one gram of sample, weighed to 0.01 g accuracy, in a BOD bottle was digested and analyzed for mercury separately on a Varian SpectrAA-300 Atomic Absorption Spectrophotometer equipped with a Varian VGA-76 vapor gas analyzer using a modified Method 7471 as given by Test Methods for Evaluating Solid Waste, USEPA, SW-846, September, 1986.

The modifications consisted of using 8 mL aqua regia (instead of 5 mL), and allowing the samples and standards to stand in a water bath for 5-8 minutes after addition of the aqua regia

The results are listed in the following tables:

Tissue Type	Table Number
Spartina Grass	1.12
Brown Shrimp	1.13
Blue Claw Crabs	1.14
Fiddler Crabs	1.15
Carbon Dioxide	1.17

Analytical Procedure for Mercury in Whole Body Rat

The subcontract laboratory determined the concentration of mercury in the samples using USEPA Method 7471 found in SW-846. The results of the analysis are listed in Table 1.16

Analytical Procedure for Lipids in Whole Body Rat

The subcontract laboratory determined the concentration of lipids in the samples using USEPA Method 301H Tetra Tech. The results of the analysis are listed in Table 1.16.

Analytical Procedure for Moisture in Whole Body Rat

The subcontract laboratory determined the concntration of moisture in the samples using Method ILMO4.0 Exhibit D, sec. 4 part F. The results of the analysis are listed in Table 1.16.

Analytical Procedure for Total Petroleum Hydrocarbons

The subcontract laboratory determined the concntration of total petroleum hydrocarbons in the samples by extracting 30g of sample with Freon, cleaning the extract with silica gel (USEPA Method 3630) and analyzing the extract using USEPA Method 418.1. The results of the analysis are listed in Table 1.18.

Analytical Procedure for Dioxin (SWRI)

The subcontract laboratory determined the concntration of polychlorinated dibenzodioxins and polychlorinated dibenzofurans in the samples using USEPA Method 8290. The results of the analysis are listed in Table 1.19.

Analytical Procedure for Dioxin (ALTA)

The subcontract laboratory determined the concntration of polychlorinated dibenzodioxins and polychlorinated dibenzofurans in the samples using USEPA Method 8290. The results of the analysis are listed in Table 1.19

Table 1.1 Results of the Analysis for BNA Compounds in Soil
WA # 0–113 LCP Chemical Site
(based on dry weight)

Client ID	Method–Blk		113104		113108		113110		113035	
Location			H1 0–6		H2 0–6		H2 12–18		Grid Marsh	
File	a0072.d		a0073.d		a0074.d		a0075.d		a0076.d	
Dil. Factor	1		1		1		1		1	
% Solids	100		20		23		21		30	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
N–nitrosodimethylamine	U	330	U	5100	U	4300	U	4600	U	3200
Phenol	U	330	U	5100	U	4300	U	4600	U	3200
Aniline	U	330	U	5100	U	4300	U	4600	U	3200
Bis(2–chloroethyl) ether	U	330	U	5100	U	4300	U	4600	U	3200
2–Chlorophenol	U	330	U	5100	U	4300	U	4600	U	3200
1,3–Dichlorobenzene	U	330	U	5100	U	4300	U	4600	U	3200
1,4–Dichlorobenzene	U	330	U	5100	U	4300	U	4600	U	3200
Benzyl alcohol	U	330	U	5100	U	4300	U	4600	U	3200
1,2–Dichlorobenzene	U	330	U	5100	U	4300	U	4600	U	3200
2–Methylphenol	U	330	U	5100	U	4300	U	4600	U	3200
Bis(2–chloroisopropyl) ether	U	330	U	5100	U	4300	U	4600	U	3200
4–Methylphenol	U	330	U	5100	U	4300	U	4600	U	3200
N–Nitrosodi–n–propylamine	U	330	U	5100	U	4300	U	4600	U	3200
Hexachloroethane	U	330	U	5100	U	4300	U	4600	U	3200
Nitrobenzene	U	330	U	5100	U	4300	U	4600	U	3200
Isophorone	U	330	U	5100	U	4300	U	4600	U	3200
2–Nitrophenol	U	330	U	5100	U	4300	U	4600	U	3200
2,4–Dimethylphenol	U	330	U	5100	U	4300	U	4600	U	3200
Bis(2–chloroethoxy) methane	U	330	U	5100	U	4300	U	4600	U	3200
Benzoic Acid	U	1700	U	25000	U	22000	U	23000	U	16000
2,4–Dichlorophenol	U	330	U	5100	U	4300	U	4600	U	3200
1,2,4–Trichlorobenzene	U	330	U	5100	U	4300	U	4600	U	3200
Naphthalene	U	330	U	5100	U	4300	U	4600	U	3200
4–Chloroaniline	U	330	U	5100	U	4300	U	4600	U	3200
Hexachlorobutadiene	U	330	U	5100	U	4300	U	4600	U	3200
4–Chloro–3–methylphenol	U	330	U	5100	U	4300	U	4600	U	3200
2–Methylnaphthalene	U	330	U	5100	U	4300	U	4600	U	3200
Hexachlorocyclopentadiene	U	330	U	5100	U	4300	U	4600	U	3200
2,4,6–Trichlorophenol	U	330	U	5100	U	4300	U	4600	U	3200
2,4,5–Trichlorophenol	U	330	U	5100	U	4300	U	4600	U	3200
2–Chloronaphthalene	U	330	U	5100	U	4300	U	4600	U	3200
2–Nitroaniline	U	330	U	5100	U	4300	U	4600	U	3200
Dimethyl phthalate	U	330	U	5100	U	4300	U	4600	U	3200
2,6–Dinitrotoluene	U	330	U	5100	U	4300	U	4600	U	3200
Acenaphthylene	U	330	U	5100	U	4300	U	4600	U	3200

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113104		113108		113110		113035	
Location			H1 0-6		H2 0-6		H2 12-18		Grid Marsh	
File	a0072.d		a0073.d		a0074.d		a0075.d		a0076.d	
Dil. Factor	1		1		1		1		1	
% Solids	100		20		23		21		30	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
3-Nitroaniline	U	330	U	5100	U	4300	U	4600	U	3200
Acenaphthene	U	330	U	5100	U	4300	U	4600	U	3200
2,4-Dinitrophenol	U	330	U	5100	U	4300	U	4600	U	3200
4-Nitrophenol	U	330	U	5100	U	4300	U	4600	U	3200
2,4-Dinitrotoluene	U	330	U	5100	U	4300	U	4600	U	3200
Dibenzofuran	U	330	U	5100	U	4300	U	4600	U	3200
Diethylphthalate	U	330	U	5100	U	4300	U	4600	U	3200
Fluorene	U	330	U	5100	U	4300	U	4600	U	3200
4-Chlorophenyl phenyl ether	U	330	U	5100	U	4300	U	4600	U	3200
4-Nitroaniline	U	330	U	5100	U	4300	U	4600	U	3200
4,6-Dinitro-2-methylphenol	U	330	U	5100	U	4300	U	4600	U	3200
N-Nitrosodiphenylamine	U	330	U	5100	U	4300	U	4600	U	3200
1,2-Diphenylhydrazine/Azobenzene	U	330	U	5100	U	4300	U	4600	U	3200
4-Bromophenyl phenyl ether	U	330	U	5100	U	4300	U	4600	U	3200
Hexachlorobenzene	U	330	U	5100	U	4300	U	4600	U	3200
Pentachlorophenol	U	330	U	5100	U	4300	U	4600	U	3200
Phenanthrene	U	330	U	5100	U	4300	U	4600	U	3200
Anthracene	U	330	U	5100	U	4300	U	4600	U	3200
Carbazole	U	330	U	5100	U	4300	U	4600	U	3200
Di-n-butyl phthalate	U	330	U	5100	U	4300	U	4600	260 J	3200
Fluoranthene	U	330	U	5100	U	4300	U	4600	U	3200
Benzidine	U	330	U	5100	U	4300	U	4600	U	3200
Pyrene	U	330	U	5100	U	4300	U	4600	U	3200
3,3'-Dimethylbenzidine	U	330	U	5100	U	4300	U	4600	U	3200
Butyl benzyl phthalate	U	330	U	5100	U	4300	U	4600	U	3200
3,3'-Dichlorobenzidine	U	330	U	5100	U	4300	U	4600	U	3200
Benzo(a)anthracene	U	330	U	5100	U	4300	U	4600	U	3200
Chrysene	U	330	U	5100	U	4300	U	4600	U	3200
Bis(2-ethylhexyl) phthalate	U	330	U	5100	U	4300	U	4600	6100	3200
Di-n-octyl phthalate	U	330	U	5100	U	4300	U	4600	U	3200
Benzo(b)fluoranthene	U	330	U	5100	U	4300	U	4600	U	3200
Benzo(k)fluoranthene	U	330	U	5100	U	4300	U	4600	U	3200
Benzo(a)pyrene	U	330	U	5100	U	4300	U	4600	U	3200
Indeno(1,2,3-c,d)pyrene	U	330	U	5100	U	4300	U	4600	U	3200
Dibenzo(a,h)anthracene	U	330	U	5100	U	4300	U	4600	U	3200
Benzo(g,h,i)perylene	U	330	U	5100	U	4300	U	4600	U	3200

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0--113 LCP Chemical Site
(based on dry weight)

Client ID	Method--Blk		113043		113044		113047		113036	
Location			Gibson Creek (0--6)109		Gibson Creek 18--24 109		Gibson Creek 48--54 109		Process South	
File	a0072.d		a0077.d		a0078.d		a0079.d		a0122.d	
Dil. Factor	1		1		1		1		1	
% Solids	100		29		37		39		87	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
N-nitrosodimethylamine	U	330	U	3400	U	2600	U	5100	U	1100
Phenol	U	330	U	3400	U	2600	U	5100	U	1100
Aniline	U	330	U	3400	U	2600	U	5100	U	1100
Bis(2-chloroethyl) ether	U	330	U	3400	U	2600	U	5100	U	1100
2-Chlorophenol	U	330	U	3400	U	2600	U	5100	U	1100
1,3-Dichlorobenzene	U	330	U	3400	U	2600	U	5100	U	1100
1,4-Dichlorobenzene	U	330	U	3400	U	2600	U	5100	U	1100
Benzyl alcohol	U	330	U	3400	U	2600	U	5100	U	1100
1,2-Dichlorobenzene	U	330	U	3400	U	2600	U	5100	U	1100
2-Methylphenol	U	330	U	3400	U	2600	U	5100	U	1100
Bis(2-chloroisopropyl) ether	U	330	U	3400	U	2600	U	5100	U	1100
4-Methylphenol	U	330	U	3400	U	2600	U	5100	U	1100
N-Nitrosodi-n-propylamine	U	330	U	3400	U	2600	U	5100	U	1100
Hexachloroethane	U	330	U	3400	U	2600	U	5100	U	1100
Nitrobenzene	U	330	U	3400	U	2600	U	5100	U	1100
Isophorone	U	330	U	3400	U	2600	U	5100	U	1100
2-Nitrophenol	U	330	U	3400	U	2600	U	5100	U	1100
2,4-Dimethylphenol	U	330	U	3400	U	2600	U	5100	U	1100
Bis(2-chloroethoxy) methane	U	330	U	3400	U	2600	U	5100	U	1100
Benzoic Acid	U	1700	U	17000	U	13000	U	25000	U	5300
2,4-Dichlorophenol	U	330	U	3400	U	2600	U	5100	U	1100
1,2,4-Trichlorobenzene	U	330	U	3400	U	2600	U	5100	U	1100
Naphthalene	U	330	U	3400	U	2600	U	5100	U	1100
4-Chloroaniline	U	330	U	3400	U	2600	U	5100	U	1100
Hexachlorobutadiene	U	330	U	3400	U	2600	U	5100	U	1100
4-Chloro-3-methylphenol	U	330	U	3400	U	2600	U	5100	U	1100
2-Methylnaphthalene	U	330	U	3400	U	2600	U	5100	120 J	1100
Hexachlorocyclopentadiene	U	330	U	3400	U	2600	U	5100	U	1100
2,4,6-Trichlorophenol	U	330	U	3400	U	2600	U	5100	U	1100
2,4,5-Trichlorophenol	U	330	U	3400	U	2600	U	5100	U	1100
2-Chloronaphthalene	U	330	U	3400	U	2600	U	5100	U	1100
2-Nitroaniline	U	330	U	3400	U	2600	U	5100	U	1100
Dimethyl phthalate	U	330	U	3400	U	2600	U	5100	U	1100
2,6-Dinitrotoluene	U	330	U	3400	U	2600	U	5100	U	1100
Acenaphthylene	U	330	U	3400	U	2600	U	5100	U	1100

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0–113 LCP Chemical Site
(based on dry weight)

Client ID	Method–Blk		113043		113044		113047		113036	
Location			Gibson Creek 0–6 109		Gibson Creek 18–24 109		Gibson Creek 48–54 109		Process South	
File	a0072.d		a0077.d		a0078.d		a0079.d		a0122.d	
Dil. Factor	1		1		1		1		1	
% Solids	100		29		37		39		87	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
3–Nitroaniline	U	330	U	3400	U	2600	U	5100	U	1100
Acenaphthene	U	330	U	3400	U	2600	U	5100	U	1100
2,4–Dinitrophenol	U	330	U	3400	U	2600	U	5100	U	1100
4–Nitrophenol	U	330	U	3400	U	2600	U	5100	U	1100
2,4–Dinitrotoluene	U	330	U	3400	U	2600	U	5100	U	1100
Dibenzofuran	U	330	U	3400	U	2600	U	5100	U	1100
Diethylphthalate	U	330	U	3400	U	2600	U	5100	U	1100
Fluorene	U	330	U	3400	U	2600	U	5100	U	1100
4–Chlorophenyl phenyl ether	U	330	U	3400	U	2600	U	5100	U	1100
4–Nitroaniline	U	330	U	3400	U	2600	U	5100	U	1100
4,6–Dinitro–2–methylphenol	U	330	U	3400	U	2600	U	5100	U	1100
N–Nitrosodiphenylamine	U	330	U	3400	U	2600	U	5100	U	1100
1,2–Diphenylhydrazine/Azobenzene	U	330	U	3400	U	2600	U	5100	U	1100
4–Bromophenyl phenyl ether	U	330	U	3400	U	2600	U	5100	U	1100
Hexachlorobenzene	U	330	U	3400	U	2600	U	5100	U	1100
Pentachlorophenol	U	330	U	3400	U	2600	U	5100	U	1100
Phenanthrene	U	330	U	3400	U	2600	U	5100	390 J	1100
Anthracene	U	330	U	3400	U	2600	U	5100	73 J	1100
Carbazole	U	330	U	3400	U	2600	U	5100	U	1100
Di–n–butyl phthalate	U	330	U	3400	U	2600	U	5100	81 J	1100
Fluoranthene	U	330	U	3400	U	2600	U	5100	180 J	1100
Benzidine	U	330	U	3400	U	2600	U	5100	U	1100
Pyrene	U	330	U	3400	U	2600	U	5100	830 J	1100
3,3'–Dimethylbenzidine	U	330	U	3400	U	2600	U	5100	U	1100
Butyl benzyl phthalate	U	330	U	3400	U	2600	U	5100	U	1100
3,3'–Dichlorobenzidine	U	330	U	3400	U	2600	U	5100	U	1100
Benzo(a)anthracene	U	330	U	3400	U	2600	U	5100	500 J	1100
Chrysene	U	330	U	3400	U	2600	U	5100	620 J	1100
Bis(2–ethylhexyl) phthalate	U	330	270 J	3400	U	2600	U	5100	120 J	1100
Di–n–octyl phthalate	U	330	U	3400	U	2600	U	5100	U	1100
Benzo(b)fluoranthene	U	330	U	3400	U	2600	U	5100	1100	1100
Benzo(k)fluoranthene	U	330	U	3400	U	2600	U	5100	680 J	1100
Benzo(a)pyrene	U	330	U	3400	U	2600	U	5100	660 J	1100
Indeno(1,2,3–cd)pyrene	U	330	U	3400	U	2600	U	5100	200 J	1100
Dibenzo(a,h)anthracene	U	330	U	3400	U	2600	U	5100	110 J	1100
Benzo(g,h,i)perylene	U	330	U	3400	U	2600	U	5100	400 J	1100

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113106		113037	
Location			H1 12-18		Cell Bldg	
File	a0072.d		a0121.d		a0124.d	
Dil. Factor	1		1		1	
% Solids	100		18		90	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
N-nitrosodimethylamine	U	330	U	3300	U	2100
Phenol	U	330	U	3300	U	2100
Aniline	U	330	U	3300	U	2100
Bis(2-chloroethyl) ether	U	330	U	3300	U	2100
2-Chlorophenol	U	330	U	3300	U	2100
1,3-Dichlorobenzene	U	330	U	3300	U	2100
1,4-Dichlorobenzene	U	330	U	3300	U	2100
Benzyl alcohol	U	330	U	3300	U	2100
1,2-Dichlorobenzene	U	330	U	3300	U	2100
2-Methylphenol	U	330	U	3300	U	2100
Bis(2-chloroisopropyl) ether	U	330	U	3300	U	2100
4-Methylphenol	U	330	U	3300	U	2100
N-Nitrosodi-n-propylamine	U	330	U	3300	U	2100
Hexachloroethane	U	330	U	3300	U	2100
Nitrobenzene	U	330	U	3300	U	2100
Isophorone	U	330	U	3300	U	2100
2-Nitrophenol	U	330	U	3300	U	2100
2,4-Dimethylphenol	U	330	U	3300	U	2100
Bis(2-chloroethoxy) methane	U	330	U	3300	U	2100
Benzoic Acid	U	1700	360	J17000	U	11000
2,4-Dichlorophenol	U	330	U	3300	U	2100
1,2,4-Trichlorobenzene	U	330	U	3300	U	2100
Naphthalene	U	330	U	3300	U	2100
4-Chloroaniline	U	330	U	3300	U	2100
Hexachlorobutadiene	U	330	U	3300	U	2100
4-Chloro-3-methylphenol	U	330	U	3300	U	2100
2-Methylnaphthalene	U	330	U	3300	U	2100
Hexachlorocyclopentadiene	U	330	U	3300	U	2100
2,4,6-Trichlorophenol	U	330	U	3300	U	2100
2,4,5-Trichlorophenol	U	330	U	3300	U	2100
2-Chloronaphthalene	U	330	U	3300	U	2100
2-Nitroaniline	U	330	U	3300	U	2100
Dimethyl phthalate	U	330	U	3300	U	2100
2,6-Dinitrotoluene	U	330	U	3300	U	2100
Acenaphthylene	U	330	U	3300	U	2100

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113106		113037	
Location			H1 12-18		Cell Bldg	
File	a0072.d		a0121.d		a0124.d	
Dil. Factor	1		1		1	
% Solids	100		18		90	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
3-Nitroaniline	U	330	U	3300	U	2100
Acenaphthene	U	330	U	3300	U	2100
2,4-Dinitrophenol	U	330	U	3300	U	2100
4-Nitrophenol	U	330	U	3300	U	2100
2,4-Dinitrotoluene	U	330	U	3300	U	2100
Dibenzofuran	U	330	U	3300	U	2100
Diethylphthalate	U	330	U	3300	U	2100
Fluorene	U	330	U	3300	U	2100
4-Chlorophenyl phenyl ether	U	330	U	3300	U	2100
4-Nitroaniline	U	330	U	3300	U	2100
4,6-Dinitro-2-methylphenol	U	330	U	3300	U	2100
N-Nitrosodiphenylamine	U	330	U	3300	U	2100
1,2-Diphenylhydrazine/Azobenzene	U	330	U	3300	U	2100
4-Bromophenyl phenyl ether	U	330	U	3300	U	2100
Hexachlorobenzene	U	330	U	3300	440	J 2100
Pentachlorophenol	U	330	U	3300	U	2100
Phenanthrene	U	330	U	3300	290	J 2100
Anthracene	U	330	U	3300	U	2100
Carbazole	U	330	U	3300	U	2100
Di-n-butyl phthalate	U	330	U	3300	270	J 2100
Fluoranthene	U	330	U	3300	570	J 2100
Benzidine	U	330	U	3300	U	2100
Pyrene	U	330	U	3300	390	J 2100
3,3'-Dimethylbenzidine	U	330	U	3300	U	2100
Butyl benzyl phthalate	U	330	U	3300	U	2100
3,3'-Dichlorobenzidine	U	330	U	3300	U	2100
Benzo(a)anthracene	U	330	U	3300	240	J 2100
Chrysene	U	330	U	3300	360	J 2100
Bis(2-ethylhexyl) phthalate	U	330	U	3300	220	J 2100
Di-n-octyl phthalate	U	330	U	3300	U	2100
Benzo(b)fluoranthene	U	330	U	3300	1100	J 2100
Benzo(k)fluoranthene	U	330	U	3300	260	J 2100
Benzo(a)pyrene	U	330	220	J 3300	280	J 2100
Indeno(1,2,3-c,d)pyrene	U	330	U	3300	320	J 2100
Dibenzo(a,h)anthracene	U	330	U	3300	150	J 2100
Benzo(g,h,i)perylene	U	330	U	3300	420	J 2100

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113048		113051		113093		113095	
Location			H3 0-12		H3 30+		H4 0-6		H4 12-18	
File	a0099.d		a0100.d		a0101.d		a0102.d		a0103.d	
Dil. Factor	1		1		1		1		1	
% Solids	100		21		28		33		21	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
N-nitrosodimethylamine	U	330	U	8900	U	6500	U	5300	U	9100
Phenol	U	330	U	8900	U	6500	U	5300	U	9100
Aniline	U	330	U	8900	U	6500	U	5300	U	9100
Bis(2-chloroethyl) ether	U	330	U	8900	U	6500	U	5300	U	9100
2-Chlorophenol	U	330	U	8900	U	6500	U	5300	U	9100
1,3-Dichlorobenzene	U	330	U	8900	U	6500	U	5300	U	9100
1,4-Dichlorobenzene	U	330	U	8900	U	6500	U	5300	U	9100
Benzyl alcohol	U	330	U	8900	U	6500	U	5300	U	9100
1,2-Dichlorobenzene	U	330	U	8900	U	6500	U	5300	U	9100
2-Methylphenol	U	330	U	8900	U	6500	U	5300	U	9100
Bis(2-chloroisopropyl) ether	U	330	U	8900	U	6500	U	5300	U	9100
4-Methylphenol	U	330	U	8900	U	6500	U	5300	U	9100
N-Nitrosodi-n-propylamine	U	330	U	8900	U	6500	U	5300	U	9100
Hexachloroethane	U	330	U	8900	U	6500	U	5300	U	9100
Nitrobenzene	U	330	U	8900	U	6500	U	5300	U	9100
Isophorone	U	330	U	8900	U	6500	U	5300	U	9100
2-Nitrophenol	U	330	U	8900	U	6500	U	5300	U	9100
2,4-Dimethylphenol	U	330	U	8900	U	6500	U	5300	U	9100
Bis(2-chloroethoxy) methane	U	330	U	8900	U	6500	U	5300	U	9100
Benzoic Acid	U	1700	910	J45000	U	32000	U	26000	910	J45000
2,4-Dichlorophenol	U	330	U	8900	U	6500	U	5300	U	9100
1,2,4-Trichlorobenzene	U	330	U	8900	U	6500	U	5300	U	9100
Naphthalene	U	330	U	8900	U	6500	U	5300	U	9100
4-Chloroaniline	U	330	U	8900	U	6500	U	5300	U	9100
Hexachlorobutadiene	U	330	U	8900	U	6500	U	5300	U	9100
4-Chloro-3-methylphenol	U	330	U	8900	U	6500	U	5300	U	9100
2-Methylnaphthalene	U	330	U	8900	U	6500	U	5300	U	9100
Hexachlorocyclopentadiene	U	330	U	8900	U	6500	U	5300	U	9100
2,4,6-Trichlorophenol	U	330	U	8900	1800	J 6500	1100	J 5300	750	J 9100
2,4,5-Trichlorophenol	U	330	U	8900	U	6500	U	5300	U	9100
2-Chloronaphthalene	U	330	U	8900	U	6500	U	5300	U	9100
2-Nitroaniline	U	330	U	8900	U	6500	U	5300	U	9100
Dimethyl phthalate	U	330	U	8900	U	6500	U	5300	U	9100
2,6-Dinitrotoluene	U	330	U	8900	U	6500	U	5300	U	9100
Acenaphthylene	U	330	U	8900	U	6500	U	5300	U	9100

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113048		113051		113093		113095	
Location			H3 0-12		H3 30+		H4 0-6		H4 12-18	
File	a0099.d		a0100.d		a0101.d		a0102.d		a0103.d	
Dil. Factor	1		1		1		1		1	
% Solids	100		21		28		33		21	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
3-Nitroaniline	U	330	U	8900	U	6500	U	5300	U	9100
Acenaphthene	U	330	U	8900	U	6500	U	5300	U	9100
2,4-Dinitrophenol	U	330	U	8900	U	6500	U	5300	U	9100
4-Nitrophenol	U	330	U	8900	U	6500	U	5300	U	9100
2,4-Dinitrotoluene	U	330	U	8900	U	6500	U	5300	U	9100
Dibenzofuran	U	330	U	8900	U	6500	U	5300	U	9100
Diethylphthalate	U	330	U	8900	U	6500	U	5300	U	9100
Fluorene	U	330	U	8900	U	6500	U	5300	U	9100
4-Chlorophenyl phenyl ether	U	330	U	8900	U	6500	U	5300	U	9100
4-Nitroaniline	U	330	U	8900	U	6500	U	5300	U	9100
4,6-Dinitro-2-methylphenol	U	330	U	8900	U	6500	U	5300	U	9100
N-Nitrosodiphenylamine	U	330	U	8900	U	6500	U	5300	U	9100
1,2-Diphenylhydrazine/Azobenzene	U	330	U	8900	U	6500	U	5300	U	9100
4-Bromophenyl phenyl ether	U	330	U	8900	U	6500	U	5300	U	9100
Hexachlorobenzene	U	330	U	8900	U	6500	U	5300	U	9100
Pentachlorophenol	U	330	U	8900	U	6500	U	5300	U	9100
Phenanthrene	U	330	U	8900	U	6500	U	5300	U	9100
Anthracene	U	330	U	8900	U	6500	U	5300	U	9100
Carbazole	U	330	U	8900	U	6500	U	5300	U	9100
Di-n-butyl phthalate	U	330	7100 J	8900	16000	6500	6100	5300	13000	9100
Fluoranthene	U	330	U	8900	U	6500	U	5300	U	9100
Benzidine	U	330	U	8900	U	6500	U	5300	U	9100
Pyrene	U	330	U	8900	U	6500	U	5300	U	9100
3,3'-Dimethylbenzidine	U	330	U	8900	U	6500	U	5300	U	9100
Butyl benzyl phthalate	U	330	U	8900	U	6500	U	5300	U	9100
3,3'-Dichlorobenzidine	U	330	U	8900	U	6500	U	5300	U	9100
Benzo(a)anthracene	U	330	U	8900	U	6500	U	5300	U	9100
Chrysene	U	330	U	8900	U	6500	U	5300	U	9100
Bis(2-ethylhexyl) phthalate	U	330	42000	8900	30000	6500	27000	5300	41000	9100
Di-n-octyl phthalate	U	330	U	8900	U	6500	U	5300	U	9100
Benzo(b)fluoranthene	U	330	U	8900	U	6500	U	5300	U	9100
Benzo(k)fluoranthene	U	330	U	8900	U	6500	U	5300	U	9100
Benzo(a)pyrene	U	330	U	8900	U	6500	U	5300	U	9100
Indeno(1,2,3-cd)pyrene	U	330	U	8900	U	6500	U	5300	U	9100
Dibenz(a,h)anthracene	U	330	U	8900	U	6500	U	5300	U	9100
Benzo(g,h,i)perylene	U	330	U	8900	U	6500	U	5300	U	9100

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113097		113098		113100		113113	
Location			H4 24-30		B1 0-6		B1 12-18		Purvis Creek 110	
File	a0099.d		a0104.d		a0105.d		a0106.d		a0108.d	
Dil. Factor	1		1		1		1		1	
% Solids	100		21		32		33		68	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
N-nitrosodimethylamine	U	330	U	8100	U	5900	U	5900	U	2600
Phenol	U	330	U	8100	U	5900	U	5900	U	2600
Aniline	U	330	U	8100	U	5900	U	5900	U	2600
Bis(2-chloroethyl) ether	U	330	U	8100	U	5900	U	5900	U	2600
2-Chlorophenol	U	330	U	8100	U	5900	U	5900	U	2600
1,3-Dichlorobenzene	U	330	U	8100	U	5900	U	5900	U	2600
1,4-Dichlorobenzene	U	330	U	8100	U	5900	U	5900	U	2600
Benzyl alcohol	U	330	U	8100	U	5900	U	5900	U	2600
1,2-Dichlorobenzene	U	330	U	8100	U	5900	U	5900	U	2600
2-Methylphenol	U	330	U	8100	U	5900	U	5900	U	2600
Bis(2-chloroisopropyl) ether	U	330	U	8100	U	5900	U	5900	U	2600
4-Methylphenol	U	330	U	8100	U	5900	U	5900	U	2600
N-Nitrosodi-n-propylamine	U	330	U	8100	U	5900	U	5900	U	2600
Hexachloroethane	U	330	U	8100	U	5900	U	5900	U	2600
Nitrobenzene	U	330	U	8100	U	5900	U	5900	U	2600
Isophorone	U	330	U	8100	U	5900	U	5900	U	2600
2-Nitrophenol	U	330	U	8100	U	5900	U	5900	U	2600
2,4-Dimethylphenol	U	330	U	8100	U	5900	U	5900	U	2600
Bis(2-chloroethoxy) methane	U	330	U	8100	U	5900	U	5900	U	2600
Benzoic Acid	U	1700	U	42000	U	30000	990	J29000	U	13000
2,4-Dichlorophenol	U	330	U	8100	U	5900	U	5900	U	2600
1,2,4-Trichlorobenzene	U	330	U	8100	U	5900	U	5900	U	2600
Naphthalene	U	330	U	8100	U	5900	U	5900	U	2600
4-Chloroaniline	U	330	U	8100	U	5900	U	5900	U	2600
Hexachlorobutadiene	U	330	U	8100	U	5900	U	5900	U	2600
4-Chloro-3-methylphenol	U	330	U	8100	U	5900	U	5900	U	2600
2-Methylnaphthalene	U	330	U	8100	U	5900	U	5900	U	2600
Hexachlorocyclopentadiene	U	330	U	8100	U	5900	U	5900	U	2600
2,4,6-Trichlorophenol	U	330	1600	J 8100	500	J 5900	1100	J 5900	370	J 2600
2,4,5-Trichlorophenol	U	330	U	8100	U	5900	U	5900	U	2600
2-Chloronaphthalene	U	330	U	8100	U	5900	U	5900	U	2600
2-Nitroaniline	U	330	U	8100	U	5900	U	5900	U	2600
Dimethyl phthalate	U	330	U	8100	U	5900	U	5900	U	2600
2,6-Dinitrotoluene	U	330	U	8100	U	5900	U	5900	U	2600
Acenaphthylene	U	330	U	8100	U	5900	U	5900	U	2600

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113097		113098		113100		113113	
Location			H4 24-30		B1 0-6		B1 12-18		Purvis Creek 110	
File	a0099.d		a0104.d		a0105.d		a0106.d		a0108.d	
Dil. Factor	1		1		1		1		1	
% Solids	100		21		32		33		68	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
3-Nitroaniline	U	330	U	8100	U	5900	U	5900	U	2600
Acenaphthene	U	330	U	8100	U	5900	U	5900	U	2600
2,4-Dinitrophenol	U	330	U	8100	U	5900	U	5900	U	2600
4-Nitrophenol	U	330	U	8100	U	5900	U	5900	U	2600
2,4-Dinitrotoluene	U	330	U	8100	U	5900	U	5900	U	2600
Dibenzofuran	U	330	U	8100	U	5900	U	5900	U	2600
Diethylphthalate	U	330	U	8100	U	5900	U	5900	U	2600
Fluorene	U	330	U	8100	U	5900	U	5900	U	2600
4-Chlorophenyl phenyl ether	U	330	U	8100	U	5900	U	5900	U	2600
4-Nitroaniline	U	330	U	8100	U	5900	U	5900	U	2600
4,6-Dinitro-2-methylphenol	U	330	U	8100	U	5900	U	5900	U	2600
N-Nitrosodiphenylamine	U	330	U	8100	U	5900	U	5900	U	2600
1,2-Diphenylhydrazine/Azobenzene	U	330	U	8100	U	5900	U	5900	U	2600
4-Bromophenyl phenyl ether	U	330	U	8100	U	5900	U	5900	U	2600
Hexachlorobenzene	U	330	U	8100	U	5900	U	5900	U	2600
Pentachlorophenol	U	330	U	8100	U	5900	U	5900	U	2600
Phenanthrene	U	330	U	8100	U	5900	U	5900	U	2600
Anthracene	U	330	U	8100	U	5900	U	5900	U	2600
Carbazole	U	330	U	8100	U	5900	U	5900	U	2600
Di-n-butyl phthalate	U	330	7200 J	8100	15000	5900	27000	5900	2700	2600
Fluoranthene	U	330	U	8100	U	5900	U	5900	U	2600
Benzidine	U	330	U	8100	U	5900	U	5900	U	2600
Pyrene	U	330	U	8100	U	5900	U	5900	U	2600
3,3'-Dimethylbenzidine	U	330	U	8100	U	5900	U	5900	U	2600
Butyl benzyl phthalate	U	330	U	8100	U	5900	U	5900	U	2600
3,3'-Dichlorobenzidine	U	330	U	8100	U	5900	U	5900	U	2600
Benzo(a)anthracene	U	330	U	8100	U	5900	U	5900	U	2600
Chrysene	U	330	U	8100	U	5900	U	5900	U	2600
Bis(2-ethylhexyl) phthalate	U	330	39000	8100	32000	5900	31000	5900	12000	2600
Di-n-octyl phthalate	U	330	U	8100	U	5900	U	5900	U	2600
Benzo(b)fluoranthene	U	330	U	8100	U	5900	U	5900	U	2600
Benzo(k)fluoranthene	U	330	U	8100	U	5900	U	5900	U	2600
Benzo(a)pyrene	U	330	U	8100	U	5900	U	5900	U	2600
Indeno(1,2,3-cd)pyrene	U	330	U	8100	U	5900	U	5900	U	2600
Dibenzo(a,h)anthracene	U	330	U	8100	U	5900	U	5900	U	2600
Benzo(ghi)perylene	U	330	U	8100	U	5900	U	5900	U	2600

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113115		113117		113119		113121		113102	
Location			Purvis Creek 12-18 110		Purvis Creek 24-30 110		Drainage Channel 0-6 114		Drainage Channel 12-18 11		B1 24-30	
File	a0099.d		a0109.d		a0110.d		a0111.d		a0112.d		a0118.d	
Dil. Factor	1		1		1		1		1		1	
% Solids	100		72		82		30		33		40	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
N-nitrosodimethylamine	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Phenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Aniline	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Bis(2-chloroethyl) ether	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2-Chlorophenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
1,3-Dichlorobenzene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
1,4-Dichlorobenzene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Benzyl alcohol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
1,2-Dichlorobenzene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2-Methylphenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Bis(2-chloroisopropyl) ether	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
4-Methylphenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
N-Nitrosodi-n-propylamine	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Hexachloroethane	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Nitrobenzene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Isophorone	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2-Nitrophenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2,4-Dimethylphenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Bis(2-chloroethoxy) methane	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Benzoic Acid	U	1700	U	13000	U	12000	U	33000	U	27000	1100	J47000
2,4-Dichlorophenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
1,2,4-Trichlorobenzene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Naphthalene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
4-Chloroaniline	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Hexachlorobutadiene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
4-Chloro-3-methylphenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2-Methylnaphthalene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Hexachlorocyclopentadiene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2,4,6-Trichlorophenol	U	330	530	J 2600	U	2400	610	J 6500	860	J 5600	850	J 9800
2,4,5-Trichlorophenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2-Chloronaphthalene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2-Nitroaniline	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Dimethyl phthalate	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2,6-Dinitrotoluene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Acenaphthylene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113115		113117		113119		113121		113102	
Location			Purvis Creek 12-18 110		Purvis Creek 24-30 110		Drainage Channel 0-6 114		Drainage Channel 12-18 11		B1 24-30	
File	a0099.d		a0109.d		a0110.d		a0111.d		a0112.d		a0118.d	
Dil. Factor	1		1		1		1		1		1	
% Solids	100		72		82		30		33		40	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
3-Nitroaniline	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Acenaphthene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2,4-Dinitrophenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
4-Nitrophenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
2,4-Dinitrotoluene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Dibenzofuran	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Diethylphthalate	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Fluorene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
4-Chlorophenyl phenyl ether	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
4-Nitroaniline	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
4,6-Dinitro-2-methylphenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
N-Nitrosodiphenylamine	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
1,2-Diphenylhydrazine/Azobenzene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
4-Bromophenyl phenyl ether	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Hexachlorobenzene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Pentachlorophenol	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Phenanthrene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Anthracene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Carbazole	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Di-n-butyl phthalate	U	330	6600	2600	2700	2400	6300 J	6500	4300 J	5600	82000	9800
Fluoranthene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Benzidine	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Pyrene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
3,3'-Dimethylbenzidine	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Butyl benzyl phthalate	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
3,3'-Dichlorobenzidine	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Benzo(a)anthracene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Chrysene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Bis(2-ethylhexyl)phthalate	U	330	18000	2600	17000	2400	33000	6500	26000	5600	31000	9800
Di-n-octyl phthalate	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Benzo(b)fluoranthene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Benzo(k)fluoranthene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Benzo(a)pyrene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Indeno(1,2,3-cd)pyrene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Dibenzo(a,h)anthracene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800
Benzo(ghi)perylene	U	330	U	2600	U	2400	U	6500	U	5600	U	9800

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		100-SED		117-SED		118-SED		119-SED		120-SED	
Location			Purvis Creek		Outfall Purvis Creek 117		South Marsh 118		South Marsh 119		North Marsh 120	
File	a0245.d		a0246.d		a0262.d		a0263.d		a0264.d		a0265.d	
Dil. Factor	1		1		1		1		1		1	
% Solids	100		37		33		31		29		25	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
N-nitrosodimethylamine	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Phenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Aniline	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Bis(2-chloroethyl) ether	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2-Chlorophenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
1,3-Dichlorobenzene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
1,4-Dichlorobenzene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Benzyl alcohol	U	330	U	2600	200 J	2900	U	3000	U	3200	U	3800
1,2-Dichlorobenzene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2-Methylphenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Bis(2-chloroisopropyl) ether	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
4-Methylphenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
N-Nitrosodi-n-propylamine	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Hexachloroethane	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Nitrobenzene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Isophorone	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2-Nitrophenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2,4-Dimethylphenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Bis(2-chloroethoxy) methane	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Benzoic Acid	U	1700	U	13000	U	15000	U	15000	U	16000	U	19000
2,4-Dichlorophenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
1,2,4-Trichlorobenzene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Naphthalene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
4-Chloroaniline	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Hexachlorobutadiene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
4-Chloro-3-methylpheno	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2-Methylnaphthalene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Hexachlorocyclopentadiene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2,4,6-Trichlorophenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2,4,5-Trichloropheno	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2-Chloronaphthalene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2-Nitroaniline	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Dimethyl phthalate	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2,6-Dinitrotoluene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Acenaphthylene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0–113 LCP Chemical Site
(based on dry weight)

Client ID	Method–Blk		100–SED		117–SED		118–SED		119–SED		120–SED	
Location			Purvis Creek		Outfall Purvis Creek 117		South Marsh 118		South Marsh 119		North Marsh 120	
File	a0245.d		a0246.d		a0262.d		a0263.d		a0264.d		a0265.d	
Dil. Factor	1		1		1		1		1		1	
% Solids	100		37		33		31		29		25	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
3–Nitroaniline	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Acenaphthene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2,4–Dinitrophenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
4–Nitrophenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
2,4–Dinitrotoluene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Dibenzofuran	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Diethylphthalate	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Fluorene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
4–Chlorophenyl phenyl ether	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
4–Nitroaniline	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
4,6–Dinitro–2–methylphenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
N–Nitrosodiphenylamine	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
1,2–Diphenylhydrazine/Azobenzene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
4–Bromophenyl phenyl ether	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Hexachlorobenzene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Pentachlorophenol	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Phenanthrene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Anthracene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Carbazole	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Di–n–butyl phthalate	U	330	35000	2600	8600	2900	7700	3000	3200 J	3200	4000	3800
Fluoranthene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Benzidine	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Pyrene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
3,3'–Dimethylbenzidine	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Butyl benzyl phthalate	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
3,3'–Dichlorobenzidine	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Benzo(a)anthracene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Chrysene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Bis(2–ethylhexyl) phthalate	U	330	740 J	2600	7600	2900	800 J	3000	840 J	3200	1000 J	3800
Di–n–octyl phthalate	U	330	U	2600	1000 J	2900	U	3000	U	3200	U	3800
Benzo(b)fluoranthene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Benzo(k)fluoranthene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Benzo(a)pyrene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Indeno(1,2,3–c,d)pyrene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Dibenzo(a,h)anthracene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800
Benzo(g,h,i)perylene	U	330	U	2600	U	2900	U	3000	U	3200	U	3800

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		121-SED		113077		113081		111-SED		112-SED	
Location			North Marsh 121		F2 0-6		F2 24-30		Drainage Channel		Purvis Creek	
File	a0245.d		a0266.d		a0267.d		a0268.d		a0255.d		a0256.d	
Dil. Factor	1		1		1		1		1		1	
% Solids	100		24		22		33		32		44	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
N-nitrosodimethylamine	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Phenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Aniline	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Bis(2-chloroethyl) ether	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2-Chlorophenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
1,3-Dichlorobenzene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
1,4-Dichlorobenzene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Benzyl alcohol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
1,2-Dichlorobenzene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2-Methylphenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Bis(2-chloroisopropyl) ether	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
4-Methylphenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
N-Nitrosodi-n-propylamine	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Hexachloroethane	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Nitrobenzene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Isophorone	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2-Nitrophenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2,4-Dimethylphenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Bis(2-chloroethoxy) methane	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Benzoic Acid	U	1700	U	19000	U	21000	U	14000	U	15000	U	11000
2,4-Dichlorophenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
1,2,4-Trichlorobenzene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Naphthalene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
4-Chloroaniline	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Hexachlorobutadiene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
4-Chloro-3-methylphenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2-Methylnaphthalene	U	330	U	3800	U	4300	220	J 2800	220	3000	U	2200
Hexachlorocyclopentadiene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2,4,6-Trichlorophenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2,4,5-Trichlorophenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2-Chloronaphthalene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2-Nitroaniline	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Dimethyl phthalate	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2,6-Dinitrotoluene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Acenaphthylene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

	Method-Blk		121-SED		113077		113081		111-SED		112-SED	
Client ID	Method-Blk		121-SED		113077		113081		111-SED		112-SED	
Location			North Marsh 121		F2 0-6		F2 24-30		Drainage Channel		Purvis Creek	
File	a0245.d		a0266.d		a0267.d		a0268.d		a0255.d		a0256.d	
Dil. Factor	1		1		1		1		1		1	
% Solids	100		24		22		33		32		44	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
3-Nitroaniline	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Acenaphthene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2,4-Dinitrophenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
4-Nitrophenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
2,4-Dinitrotoluene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Dibenzofuran	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Diethylphthalate	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Fluorene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
4-Chlorophenyl phenyl ether	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
4-Nitroaniline	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
4,6-Dinitro-2-methylphenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
N-Nitrosodiphenylamine	U	330	U	3800	U	4300	1700 J	2800	U	3000	U	2200
1,2-Diphenylhydrazine/Azobenzene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
4-Bromophenyl phenyl ether	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Hexachlorobenzene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Pentachlorophenol	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Phenanthrene	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Anthracene	U	330	U	3800	U	4300	330 J	2800	U	3000	U	2200
Carbazole	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Di-n-butyl phthalate	U	330	11000	3800	4000 J	4300	8100	2800	2800 J	3000	2300	2200
Fluoranthene	U	330	U	3800	U	4300	600 J	2800	U	3000	U	2200
Benzidine	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Pyrene	U	330	U	3800	U	4300	6000	2800	U	3000	U	2200
3,3'-Dimethylbenzidine	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Butyl benzyl phthalate	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
3,3'-Dichlorobenzidine	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Benzo(a)anthracene	U	330	U	3800	U	4300	1500 J	2800	U	3000	U	2200
Chrysene	U	330	U	3800	U	4300	1800 J	2800	U	3000	U	2200
Bis(2-ethylhexyl) phthalate	U	330	1200 J	3800	940 J	4300	810 J	2800	800 J	3000	1500 J	2200
Di-n-octyl phthalate	U	330	U	3800	U	4300	U	2800	U	3000	U	2200
Benzo(b)fluoranthene	U	330	U	3800	U	4300	2000 J	2800	U	3000	U	2200
Benzo(k)fluoranthene	U	330	U	3800	U	4300	470 J	2800	U	3000	U	2200
Benzo(a)pyrene	U	330	U	3800	U	4300	1600 J	2800	U	3000	U	2200
Indeno(1,2,3-c,d)pyrene	U	330	U	3800	U	4300	260 J	2800	U	3000	U	2200
Dibenzo(a,h)anthracene	U	330	U	3800	U	4300	300 J	2800	U	3000	U	2200
Benzo(g,h,i)perylene	U	330	U	3800	U	4300	460 J	2800	U	3000	U	2200

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113-SED		115-SED		116-SED		106-SED	
Location			Main Tributary		Main Tributary		Main Tributary		Purvis Creek	
File	a0245.d		a0257.d		a0258.d		a0259.d		a0247.d	
Dil. Factor	1		1		1		1		1	
% Solids	100		22		29		32		81	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
N-nitrosodimethylamine	U	330	U	2900	U	3100	U	3000	U	1200
Phenol	U	330	U	2900	U	3100	U	3000	U	1200
Aniline	U	330	U	2900	U	3100	U	3000	U	1200
Bis(2-chloroethyl) ether	U	330	U	2900	U	3100	U	3000	U	1200
2-Chlorophenol	U	330	U	2900	U	3100	U	3000	U	1200
1,3-Dichlorobenzene	U	330	U	2900	U	3100	U	3000	U	1200
1,4-Dichlorobenzene	U	330	U	2900	U	3100	U	3000	U	1200
Benzyl alcohol	U	330	U	2900	U	3100	U	3000	U	1200
1,2-Dichlorobenzene	U	330	U	2900	U	3100	U	3000	U	1200
2-Methylphenol	U	330	U	2900	U	3100	U	3000	U	1200
Bis(2-chloroisopropyl) ether	U	330	U	2900	U	3100	U	3000	U	1200
4-Methylphenol	U	330	U	2900	U	3100	U	3000	U	1200
N-Nitrosodi-n-propylamine	U	330	U	2900	U	3100	U	3000	U	1200
Hexachloroethane	U	330	U	2900	U	3100	U	3000	U	1200
Nitrobenzene	U	330	U	2900	U	3100	U	3000	U	1200
Isophorone	U	330	U	2900	U	3100	U	3000	U	1200
2-Nitrophenol	U	330	U	2900	U	3100	U	3000	U	1200
2,4-Dimethylphenol	U	330	U	2900	U	3100	U	3000	U	1200
Bis(2-chloroethoxy) methane	U	330	U	2900	U	3100	U	3000	U	1200
Benzoic Acid	U	1700	U	15000	U	16000	U	15000	U	6000
2,4-Dichlorophenol	U	330	U	2900	U	3100	U	3000	U	1200
1,2,4-Trichlorobenzene	U	330	U	2900	U	3100	U	3000	U	1200
Naphthalene	U	330	U	2900	U	3100	U	3000	U	1200
4-Chloroaniline	U	330	U	2900	U	3100	U	3000	U	1200
Hexachlorobutadiene	U	330	U	2900	U	3100	U	3000	U	1200
4-Chloro-3-methylphenol	U	330	U	2900	U	3100	U	3000	U	1200
2-Methylnaphthalene	U	330	U	2900	U	3100	U	3000	U	1200
Hexachlorocyclopentadiene	U	330	U	2900	U	3100	U	3000	U	1200
2,4,6-Trichlorophenol	U	330	U	2900	U	3100	U	3000	U	1200
2,4,5-Trichlorophenol	U	330	U	2900	U	3100	U	3000	U	1200
2-Chloronaphthalene	U	330	U	2900	U	3100	U	3000	U	1200
2-Nitroaniline	U	330	U	2900	U	3100	U	3000	U	1200
Dimethyl phthalate	U	330	U	2900	U	3100	U	3000	U	1200
2,6-Dinitrotoluene	U	330	U	2900	U	3100	U	3000	U	1200
Acenaphthylene	U	330	U	2900	U	3100	U	3000	U	1200

Table 1.1 (Cont) Results of the Analysis for BNA Compounds in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Client ID	Method-Blk		113-SED		115-SED		116-SED		106-SED	
Location			Main Tributary		Main Tributary		Main Tributary		Purvis Creek	
File	a0245.d		a0257.d		a0258.d		a0259.d		a0247.d	
Dil. Factor	1		1		1		1		1	
% Solids	100		22		29		32		81	
Compound	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg	Conc ug/kg	MDL ug/kg
3-Nitroaniline	U	330	U	2900	U	3100	U	3000	U	1200
Acenaphthene	U	330	U	2900	U	3100	U	3000	U	1200
2,4-Dinitrophenol	U	330	U	2900	U	3100	U	3000	U	1200
4-Nitrophenol	U	330	U	2900	U	3100	U	3000	U	1200
2,4-Dinitrotoluene	U	330	U	2900	U	3100	U	3000	U	1200
Dibenzofuran	U	330	U	2900	U	3100	U	3000	U	1200
Diethylphthalate	U	330	U	2900	U	3100	U	3000	U	1200
Fluorene	U	330	U	2900	U	3100	U	3000	U	1200
4-Chlorophenyl phenyl ether	U	330	U	2900	U	3100	U	3000	U	1200
4-Nitroaniline	U	330	U	2900	U	3100	U	3000	U	1200
4,6-Dinitro-2-methylphenol	U	330	U	2900	U	3100	U	3000	U	1200
N-Nitrosodiphenylamine	U	330	U	2900	U	3100	U	3000	U	1200
1,2-Diphenylhydrazine/Azobenzene	U	330	U	2900	U	3100	U	3000	U	1200
4-Bromophenyl phenyl ether	U	330	U	2900	U	3100	U	3000	U	1200
Hexachlorobenzene	U	330	U	2900	U	3100	U	3000	U	1200
Pentachlorophenol	U	330	U	2900	U	3100	U	3000	U	1200
Phenanthrene	U	330	U	2900	U	3100	U	3000	U	1200
Anthracene	U	330	U	2900	U	3100	U	3000	U	1200
Carbazole	U	330	U	2900	U	3100	U	3000	U	1200
Di-n-butyl phthalate	U	330	3300	2900	19000	3100	3400	3000	3300	1200
Fluoranthene	U	330	U	2900	U	3100	U	3000	U	1200
Benzidine	U	330	U	2900	U	3100	U	3000	U	1200
Pyrene	U	330	U	2900	U	3100	U	3000	U	1200
3,3'-Dimethylbenzidine	U	330	U	2900	U	3100	U	3000	U	1200
Butyl benzyl phthalate	U	330	U	2900	U	3100	U	3000	U	1200
3,3'-Dichlorobenzidine	U	330	U	2900	U	3100	U	3000	U	1200
Benzo(a)anthracene	U	330	U	2900	U	3100	U	3000	U	1200
Chrysene	U	330	U	2900	U	3100	U	3000	U	1200
Bis(2-ethylhexyl) phthalate	U	330	910 J	2900	1100 J	3100	1000 J	3000	240 J	1200
Di-n-octyl phthalate	U	330	U	2900	U	3100	U	3000	U	1200
Benzo(b)fluoranthene	U	330	U	2900	U	3100	U	3000	U	1200
Benzo(k)fluoranthene	U	330	U	2900	U	3100	U	3000	U	1200
Benzo(a)pyrene	U	330	U	2900	U	3100	U	3000	U	1200
Indeno(1,2,3-c,d)pyrene	U	330	U	2900	U	3100	U	3000	U	1200
Dibenzo(a,h)anthracene	U	330	U	2900	U	3100	U	3000	U	1200
Benzo(g,h,i)perylene	U	330	U	2900	U	3100	U	3000	U	1200

Table 1.2 Results of the Analysis for Aroclor 1268 in Soil
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample ID	Sample Location	% Solids	Aroclor 1268 (ug/kg)	MDL (ug/kg)
Blank 229	Sand Blank	100	U	50
A 113008	A5	25	1800	200
A 113009	A7	30	710	180
A 113010	B4	24	1600	200
A 113011	B6	25	1600	190
A 113012	B7	28	4600	180
A 113013	C5	23	470	220
A 113014	E5	18	U	260
A 113015	G5	16	2200	300
A 113016	I5	18	3200	270
A 113017	K5	18	990	280
A 113018	M5	28	2200	180
A 113019	E7	21	U	230
A 113020	G7	29	1800	180
A 100-SED	Purvis Creek	32	1100	150
A 101-SED	Purvis Creek	28	U	170
A 102-SED	Purvis Creek	30	130 J	160
A 103-SED	Purvis Creek	27	U	180
Blank 230	Sand Blank	100	U	50
A 113001	D4	23	42000	200
A 113002	E4	12	56000	390
A 113003	F4	17	47000	280
A 113004	G4	18	71000	270
A 113005	H4	19	66000	250
A 113006	I4	16	17000	310
A 113007	J4	17	16000	290

**Table 1.2 (Cont) Results of the Analysis for Aroclor 1268 in Soil
WA # 0113 LCP Chemical Site
(based on dry weight)**

Sample ID	Sample Location	% Solids	Aroclor 1268 (ug/kg)	MDL (ug/kg)
Blank 231	Sand Blank	100	U	50
A1-SEDREF	Little satilla	23	U	210
A104-SED	Purvis Creek	32	2700	2100
A105-SED	Purvis Creek	28	990	180
A106-SED	Purvis Creek	20	180 J	190
A107-SED	Purvis Creek	29	580	160
B 113035	Grid Marsh	25	6100	2600
B 113036	Process south	85	450000	630
B 113037	Cell Bldg	89	53000	840
A 113039	Turtle River US 0-6 108	26	600	150
A 113040	Turtle River 24-30 108	34	88 J	110
A 113042	Turtle River 48-54 108	40	U	120
A 113043	Gibeon Creek 0-6 109	25	200	160
A 113044	Gibeon Creek 18-24 109	38	U	120
A 113047	Gibeon Creek 48-54 109	36	U	130
A 113048	H3 0-12	17	39000	220
B 113051	H3 30+	30	240	120
A 113073	J1 0-6	15	5400	4100
A 113074	L1 0-6	78	850	63
A 113076	L1 12-18	74	160	59
A 113077	F2 0-6	28	1100000	2100
Blank 232	Sand Blank	100	U	50
A 113079	F2 12-18	24	88000	2600
A 113081	F2 24-30	27	110000	2700
A 113093	H4 0-6	20	26000	210
A 113095	H4 12-18	19	32000	240
A 113097	H4 24-30	28	99 J	130
A 113098	B1 0-6	26	15000	170
A 113100	B1 12-18	25	1200	190
A 113102	B1 24-30	37	140	110
A 113082	E3 0-6	18	420000	3800
A 113084	E3 12-18	25	230000	2700
A 113086	E3 24-30	31	430000	1900
A 113089	B2 0-6	25	8900	140
A 113091	B2 12-18	28	5400	2600
A 113104	H1 0-6	24	490000	2200
A 113106	H1 12-18	25	150000	2400
A 113108	H2 0-6	22	190000	2800
A 113110	H2 12-18	23	5900	200

Table 1.2 (Cont) Results of the Analysis for Aroclor 1268 in Soil
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample ID	Sample Location	% Solids	Aroclor 1268 (ug/kg)	MDL (ug/kg)
Blank 233	Sand blank	100	U	50
A111-SED	Drainage Channel	29	6100	2300
A112-SED	Purvis Creek	34	4800	2200
A113-SED	Main tributary	29	29000	2300
A 113113	Purvis Creek 0-6 110	74	250	68
A 113115	Purvis Creek 12-18 110	57	1400	1200
A 113117	Purvis Creek 24-30 110	62	5400	1000
A 113119	Drainage Channel 0-6 114	25	20000	2600
A 113121	Drainage Channel 12-18 11	31	22000	2300
A115-SED	Main tributary	29	2400	140
A116-SED	Main tributary	29	5000	150
A117-SED	Outfall Purvis Creek 117	33	11000	1900
A118-SED	South Marsh 118	32	10000	2300
A119-SED	South Marsh 119	27	3800	190
A120-SED	North Marsh 120	24	17000	2600
A121-SED	North Marsh 121	24	1800	170
A122-SED	Turtle river 122	56	U	66

Table 1.3 Results of the Analysis for Aroclor 1268 in Spartina Grass
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample Location	Sample Number	PCB 1268 (mg/kg)	MDL (mg/kg)	Percent Lipid	Percent Solid
Little Satilla	A113052	0.01 J	0.08	1.4	25
Little Satilla	A113053	0.02 J	0.09	1.6	23
Little Satilla	A113054	0.01 J	0.07	1.1	29
Little Satilla	A113055	0.01 J	0.06	1.9	31
Little Satilla	A113056	0.01 J	0.07	1.8	29
Little Satilla	A113057	0.02 J	0.07	1.7	27
Little Satilla	A113058	0.02 J	0.08	1.4	24

Table 1.4 Results of the Analysis for Aroclor 1268 in Brown Shrimp
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample Location	Sample Number	PCB 1268 (mg/kg)	MDL (mg/kg)	Percent Lipid	Percent Solid
Little Satilla	A113059	0.10	0.10	5.1	20
Little Satilla	A113060	0.07 J	0.09	5.4	22
Little Satilla	A113061	0.09 J	0.10	4.4	20
Little Satilla	A113062	0.08 J	0.09	4.5	21
Little Satilla	A113063	0.09 J	0.10	4.0	20
Little Satilla	A113064	0.08 J	0.09	4.0	21
Little Satilla	A113065	0.08 J	0.09	4.4	20
Purvis Creek D.S.	A113130	1.3	0.08	4.6	23
Purvis Creek D.S.	A113131	1.0	0.10	2.0	21
Purvis Creek D.S.	A113132	1.3	0.09	4.8	22
Purvis Creek D.S.	A113133	1.3	0.10	4.7	20
Purvis Creek D.S.	A113134	1.4	0.10	5.1	20
Purvis Creek D.S.	A113135	1.4	0.09	5.2	21
Purvis Creek D.S.	A113136	0.92	0.10	4.3	20

Table 1.5 Results of the Analysis for Aroclor 1268 in Blue Claw Crabs
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample Location	Sample Number	PCB 1268 (mg/kg)	MDL (mg/kg)	Percent Lipid	Percent Solid
Little Satilla	A113066	0.04 J	0.07	2.9	29
Little Satilla	A113067	0.06	0.06	3.4	31
Little Satilla	A113068	0.06	0.06	5.7	32
Little Satilla	A113069	0.04 J	0.08	1.1	23
Little Satilla	A113070	0.03 J	0.08	1.6	24
Little Satilla	A113071	0.03 J	0.07	1.2	26
Little Satilla	A113072	0.04 J	0.08	1.2	25
Purvis Creek D.S	A113153	4.7	0.10	2.3	18
Purvis Creek D.S.	A113154	1.4	0.08	1.6	25
Purvis Creek D.S.	A113155	3.0	0.08	2.1	25
Purvis Creek D.S.	A113156	2.2	0.14	2.9	14
Purvis Creek D.S.	A113157	2.4	0.09	2.3	21
Purvis Creek D.S.	A113158	0.6	0.08	2.0	24
Purvis Creek D.S.	A113159	5.1	0.08	2.1	24

Table 1.6 Results of the Analysis for Aroclor 1268 in Fiddler Crabs
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample Location	Sample Number	PCB 1268 (mg/kg)	MDL (mg/kg)	Percent Lipid	Percent Solid
19 – 20	A113137	26	0.08	2.0	25
19 – 20	A113138	13	0.07	1.7	28
19 – 20	A113139	21	0.08	2.3	25
19 – 20	A113140	23	0.07	1.9	27
19 – 20	A113141	22	0.07	1.5	26
19 – 20	A113142	19	0.08	1.6	25
19 – 20	A113143	26	0.08	1.9	26
17 – 18	A113144	24	0.08	1.0	24
17 – 18	A113145	78	0.10	2.0	20
17 – 18	A113146	49	0.08	2.4	24
17 – 18	A113147	47	0.08	2.0	24
17 – 18	A113148	10	0.08	2.2	26
REFERENCE	A113151	0.06 J	0.07	1.3	27
REFERENCE	A113152	0.03 J	0.06	3.0	30

Table 1.7 Results of the Analysis for PCBs in Whole Body Rat
WA # 0113 LCP Chemical Site
(based on dry weight)

Sample ID	BLK pg23		North Marsh 113200		North Marsh 113201	
Location			Whole body		Whole body	
Analyte	Conc (ug/kg)	MDL (ug/kg)	Conc (ug/kg)	MDL (ug/kg)	Conc (ug/kg)	MDL (ug/kg)
Aroclor 1016	U	20	U	63	U	64
Aroclor 1221	U	20	U	63	U	64
Aroclor 1232	U	20	U	63	U	64
Aroclor 1242	U	20	U	63	U	64
Aroclor 1248	U	20	U	63	U	64
Aroclor 1254	U	20	117	63	U	64
Aroclor 1260	U	20	U	63	U	64
Aroclor 1268*	U	20	260	67	320	67

* denotes that this sample was analyzed at REAC

Table 1.8 Results of the Analysis for PCBs in Tissue Blanks
WA # 0-113 LCP Chemical

Client ID / Location	METHOD BLK 10/21/95			METHOD BLK 10/23/95		METHOD BLK 10/24/95	
Analyte	Conc µg/kg		MDL µg/kg	Conc µg/kg	MDL µg/kg	Conc µg/kg	MDL µg/kg
Aroclor 1016	U		20	U	20	U	20
Aroclor 1221	U		40	U	40	U	40
Aroclor 1232	U		20	U	20	U	20
Aroclor 1242	U		20	U	20	U	20
Aroclor 1248	U		20	U	20	U	20
Aroclor 1254	U		20	U	20	U	20
Aroclor 1260	U		20	U	20	U	20
Aroclor 1268	2	WJ	20	U	20		

W Denotes Weathered

Table 1.9 Correlation of Samples and Blanks for Aroclor 1268 in Tissue WA # 0-113 LCP Chemical

Method BLK 10/21/95

Samples Extracted	Matrix
A113052	Spartina Grass
A113053	Spartina Grass
A113054	Spartina Grass
A113055	Spartina Grass
A113056	Spartina Grass
A113056 MS	Spartina Grass
A113056 MSD	Spartina Grass
A113057	Spartina Grass
A113058	Spartina Grass
A113059	Brown Shrimp
A113060	Brown Shrimp
A113061	Brown Shrimp
A113062	Brown Shrimp
A113063	Brown Shrimp
A113064	Brown Shrimp
A113065	Brown Shrimp
A113066	Blue Claw Crabs
A113067	Blue Claw Crabs
A113068	Blue Claw Crabs
A113069	Blue Claw Crabs
A113070	Blue Claw Crabs
A113071	Blue Claw Crabs
A113072	Blue Claw Crabs

Table 1.9 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissue WA # 0-113 LCP Chemical

Method BLK 10/23/95

Samples Extracted	Matrix
A113137	Fiddler Crabs
A113138	Fiddler Crabs
A113139	Fiddler Crabs
A113140	Fiddler Crabs
A113141	Fiddler Crabs
A113142	Fiddler Crabs
A113143	Fiddler Crabs
A113144	Fiddler Crabs
A113145	Fiddler Crabs
A113146	Fiddler Crabs
A113147	Fiddler Crabs
A113148	Fiddler Crabs
A113151	Fiddler Crabs
A113152	Fiddler Crabs
A113153	Blue Claw Crabs
A113155	Blue Claw Crabs
A113158	Blue Claw Crabs
A113159	Blue Claw Crabs
A113159 MS	Blue Claw Crabs
A113159 MSD	Blue Claw Crabs
A113130	Brown Shrimp

Table 1.9 (Cont) Correlation of Samples and Blanks for Aroclor 1268 in Tissue WA # 0-113 LCP Chemical

Method BLK 10/24/95

Samples Extracted	Matrix
A113131	Brown Shrimp
A113131 MS	Brown Shrimp
A113131 MSD	Brown Shrimp
A113132	Brown Shrimp
A113133	Brown Shrimp
A113134	Brown Shrimp
A113135	Brown Shrimp
A113136	Brown Shrimp
A113136 MS	Brown Shrimp
A113136 MSD	Brown Shrimp
A113154	Blue Claw Crabs
A113154 MS	Blue Claw Crabs
A113154 MSD	Blue Claw Crabs
A113156	Blue Claw Crabs
A113157	Blue Claw Crabs

Table 1.10 Results of the Analysis for Metals in Sediment
WA # 0–113 LCP Chemical Site
(based on dry weight)

Sample ID / Location	Blank		A 113035 Grid Marsh		A 113037 Cell Bldg		C 113043 Gibson Creek 0–6 109		C 113044 Gibson Creek 18–24 109		C 113047 Gibson Creek 48–54 109	
% Solids	100		30		90		29		37		39	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	U	5.0	18000	17	1400	5.6	48000	17	42000	14	46000	13
Antimony	U	0.20	U	17	U	5.6	U	17	U	14	U	13
Arsenic	U	0.01	5.3	1.7	0.41	0.28	13	1.7	12	1.4	15	1.3
Barium	U	0.50	70	1.7	18	0.56	44	1.7	36	1.4	40	1.3
Beryllium	U	0.10	U	0.33	U	0.11	1.7	0.35	1.8	0.27	1.9	0.26
Cadmium	U	0.25	U	0.82	U	0.28	U	0.87	U	0.68	U	0.64
Calcium	U	20	2300	66	410	22	3300	69	2400	55	2600	52
Chromium	U	0.50	66	1.7	5.4	0.56	88	1.7	64	1.4	67	1.3
Cobalt	U	1.0	U	3.3	U	1.1	U	3.5	U	2.7	U	2.6
Copper	U	1.0	17	3.3	20	1.1	15	3.5	10	2.7	10	2.6
Iron	U	7.5	13000	25	3000	8.3	39000	26	31000	21	39000	19
Lead	U	5.0	34	17	15	5.6	29	17	27	14	28	13
Magnesium	U	5.0	4200	17	210	5.6	7500	17	7300	14	7400	13
Manganese	U	0.25	92	0.82	20	0.28	260	0.87	210	0.68	310	0.64
Mercury	U	0.013	26	2.1	15	0.70	0.51	0.043	0.07	0.034	0.04	0.032
Nickel	U	1.5	11	4.9	6.3	1.7	32	5.2	19	4.1	20	3.9
Potassium	U	5.0	2300	17	83	5.6	4600	17	4700	14	5200	13
Selenium	U	0.20	U	17	U	5.6	U	17	U	14	U	13
Silver	U	0.50	U	1.7	U	0.56	U	1.7	U	1.3	U	1.3
Sodium	U	5.0	14000	17	230	5.6	15000	17	12000	14	14000	13
Thallium	U	0.20	U	0.66	U	0.22	U	0.69	U	0.55	U	0.52
Vanadium	U	0.75	43	2.5	3.1	0.83	83	2.6	70	2.1	72	1.9
Zinc	U	0.50	52	1.7	35	0.56	69	1.7	53	1.4	54	1.3

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0–113 LCP Chemical Site
(based on dry weight)

Sample ID	Blank		C 113048		C 113051		C 113093		C 113095		C 113097	
Location			H3 0–12		H3 30+		H4 0–6		H4 12–18		H4 24–30	
% Solids	100		21		28		33		21		21	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	U	5.0	31000	24	52000	18	28000	15	46000	23	49000	24
Antimony	U	0.20	U	24	U	18	U	15	U	23	U	24
Arsenic	U	0.01	5.6	1.2	7.7	1.8	5.2	1.5	5.8	2.3	6.2	1.2
Barium	U	0.50	31	2.4	48	1.8	29	1.5	45	2.3	46	2.4
Beryllium	U	0.10	0.99	0.48	1.5	0.36	0.87	0.31	1.3	0.47	1.6	0.49
Cadmium	U	0.25	U	1.2	U	0.90	U	0.77	U	1.2	U	1.2
Calcium	U	20	3400	96	2500	72	2400	62	4400	93	3800	98
Chromium	U	0.50	97	2.4	57	1.8	97	1.5	99	2.3	150	2.4
Cobalt	U	1.0	U	4.8	U	3.6	U	3.1	U	4.7	U	4.9
Copper	U	1.0	45	4.8	20	3.6	29	3.1	27	4.7	39	4.9
Iron	U	7.5	24000	36	34000	27	18000	23	29000	35	32000	37
Lead	U	5.0	99	24	180	18	56	15	79	23	130	24
Magnesium	U	5.0	6900	24	6600	18	4900	15	7500	23	8600	24
Manganese	U	0.25	130	1.2	240	0.90	90	0.77	180	1.2	180	1.2
Mercury	U	0.013	240	5.9	1.01	0.045	74	1.9	57	2.9	39	3.0
Nickel	U	1.5	29	7.2	26	5.4	18	4.6	27	7.0	33	7.3
Potassium	U	5.0	3600	24	4500	18	2800	15	4600	23	5100	24
Selenium	U	0.20	U	24	U	18	U	15	U	23	U	24
Silver	U	0.50	U	2.4	U	1.8	U	1.5	U	2.3	U	2.4
Sodium	U	5.0	22000	24	27000	18	11000	15	20000	23	22000	24
Thallium	U	0.20	U	0.96	U	0.72	U	0.62	U	0.93	U	0.98
Vanadium	U	0.75	68	3.6	74	2.7	62	2.3	97	3.5	110	3.7
Zinc	U	0.50	130	2.4	75	1.8	86	1.5	110	2.3	150	2.4

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Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	Blank		C 113098		C 113100		C 113102		A 113036	
Location			B1 0-6		B1 12-18		B1 24-30		Process South	
% Solids	100		32		33		40		87	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	U	5.0	42000	16	56000	15	55000	13	2500	5.8
Antimony	U	0.20	U	16	U	15	U	13	U	5.8
Arsenic	U	0.01	10.4	1.6	17	1.5	24	1.3	0.8	0.58
Barium	U	0.50	50	1.6	57	1.5	54	1.3	23	0.58
Beryllium	U	0.10	1.5	0.32	1.9	0.31	1.7	0.25	U	0.12
Cadmium	U	0.25	U	0.80	U	0.77	U	0.63	U	0.29
Calcium	U	20	3100	64	2900	62	2500	51	730	23
Chromium	U	0.50	100	1.6	77	1.5	65	1.3	8.9	0.58
Cobalt	U	1.0	U	3.2	U	3.1	3.4	2.5	U	1.2
Copper	U	1.0	43	3.2	31	3.1	37	2.5	21	1.2
Iron	U	7.5	29000	24	44000	23	50000	19	4600	8.7
Lead	U	5.0	85	16	160	15	210	13	65	5.8
Magnesium	U	5.0	7100	16	7700	15	6600	13	400	5.8
Manganese	U	0.25	240	0.80	260	0.77	490	0.63	26	0.29
Mercury	U	0.013	95	0.039	1.5	1.9	7.2	0.32	450	36
Nickel	U	1.5	24	4.8	25	4.6	30	3.8	36	1.7
Potassium	U	5.0	4000	16	4900	15	4800	13	140	5.8
Selenium	U	0.20	U	16	U	15	U	13	U	5.8
Silver	U	0.50	U	1.6	U	1.5	U	1.3	U	0.59
Sodium	U	5.0	14000	16	14000	15	12000	13	240	5.8
Thallium	U	0.20	U	0.64	U	0.62	U	0.51	U	0.23
Vanadium	U	0.75	84	2.4	83	2.3	78	1.9	8.3	0.87
Zinc	U	0.50	120	1.6	150	1.5	180	1.3	30	0.58

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	Blank		B 111-SED		B 112-SED		B 113-SED	
Location			Drainage Channel		Purvis Creek		Main Tributary	
% Solids	100		32		44		32	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	U	4.0	57000	12	32000	9.2	53000	12
Antimony	U	4.0	U	12	U	9.2	U	12
Arsenic	U	0.008	11	1.2	8.5	0.92	12	1.2
Barium	U	0.40	53	1.2	30	0.92	48	1.2
Beryllium	U	0.08	1.7	0.25	1.0	0.18	1.5	0.25
Cadmium	U	0.20	U	0.62	U	0.46	U	0.62
Calcium	U	16	3700	50	2200	37	4100	49
Chromium	U	0.40	110	1.2	6.7	0.92	110	1.2
Cobalt	U	0.8	U	2.5	U	1.8	U	2.5
Copper	U	0.8	18	2.5	11	1.8	27	2.5
Iron	U	6.0	33000	19	21000	14	33000	18
Lead	U	4.0	36	12	27	9.2	48	12
Magnesium	U	4.0	7400	12	4900	9.2	7600	12
Manganese	U	0.20	420	0.62	200	0.46	360	0.62
Mercury	U	0.013	3.6	0.038	1.0	0.029	9.7	0.039
Nickel	U	1.2	24	3.7	15	2.8	24	3.7
Potassium	U	4.0	3900	12	2500	9.2	4000	12
Selenium	U	4.0	U	12	U	9.2	U	12
Silver	U	0.50	U	1.6	U	1.1	U	1.5
Sodium	U	4.0	13000	12	8900	9.2	14000	12
Thallium	U	0.16	U	0.50	U	0.37	U	0.49
Vanadium	U	0.60	84	1.9	51	1.4	79	1.8
Zinc	U	0.40	82	1.2	53	0.92	84	1.2

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID / Location	Blank		B 115-SED Main Tributary		B 116-SED Main Tributary		B 106-SED Purvis Creek		B 113077 F2 0-6		B 113081 F2 24-30	
% Solids	100		29		32		22		22		34	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	U	4.0	59000	14	46000	13	42000	18	38000	18	41000	12
Antimony	U	4.0	U	14	U	13	U	18	U	18	U	12
Arsenic	U	0.008	12	1.4	11	1.3	12	1.8	6.3	1.8	7.6	1.2
Barium	U	0.40	55	1.4	44	1.3	44	1.8	65	1.8	82	1.2
Beryllium	U	0.08	1.7	0.28	1.5	0.25	1.3	0.36	0.90	0.37	1.0	0.24
Cadmium	U	0.20	U	0.68	U	0.63	U	0.91	U	0.91	U	0.60
Calcium	U	16	3800	55	3200	51	5200	73	48000	73	73000	48
Chromium	U	0.40	130	1.4	110	1.3	99	1.8	81	1.8	46	1.2
Cobalt	U	0.8	U	2.7	U	2.5	U	3.6	U	3.7	U	2.4
Copper	U	0.8	21	2.7	17	2.5	16	3.6	49	3.7	33	2.4
Iron	U	6.0	35000	21	30000	19	32000	27	24000	27	26000	18
Lead	U	4.0	46	14	42	13	30	18	190	18	570	12
Magnesium	U	4.0	8400	14	7400	13	8100	18	15000	18	8300	12
Manganese	U	0.20	320	0.68	350	0.63	650	0.91	230	0.91	210	0.60
Mercury	U	0.013	9.2	0.042	10	0.39	NA	NA	NR	NA	NR	NA
Nickel	U	1.2	29	4.1	25	3.8	25	5.4	30	5.5	29	3.6
Potassium	U	4.0	4500	14	3700	13	3900	18	3100	18	3100	12
Selenium	U	4.0	U	14	U	13	U	18	U	18	U	12
Silver	U	0.50	U	1.7	U	1.6	U	2.3	U	4.6	U	2.9
Sodium	U	4.0	15000	14	14000	13	21000	18	20000	18	19000	12
Thallium	U	0.16	U	0.55	U	0.51	U	0.73	U	0.73	U	0.48
Vanadium	U	0.60	94	2.1	79	1.9	72	2.7	86	2.7	62	1.8
Zinc	U	0.40	94	1.4	83	1.3	74	1.8	190	1.8	91	1.2

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	Blank		C 113113		C 113115		C 113117		C 113119		C 113121	
Location			Purvis Creek 0-6 110		Purvis Creek 12-18 110		Purvis Creek 24-30 110		Drainage Channel 0-6 114		Drainage Channel 12-18 11	
% Solids	100		68		72		82		30		33	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	U	5.0	6200	7.3	15000	6.9	5800	6.2	30000	16	38000	15
Antimony	U	0.20	U	7.3	U	6.9	U	6.2	U	16	U	15
Arsenic	U	0.01	2.6	0.73	2.4	0.69	1.9	0.62	7.1	1.6	14	1.5
Barium	U	0.50	9.1	0.73	17	0.69	7.6	0.62	37	1.6	43	1.5
Beryllium	U	0.10	0.25	0.15	0.53	0.14	0.22	0.12	1.4	0.33	1.4	0.30
Cadmium	U	0.25	U	0.37	U	0.34	U	0.31	U	0.82	U	0.76
Calcium	U	20	1300	29	1600	28	1300	25	4200	65	3100	61
Chromium	U	0.50	17	0.73	39	0.69	17	0.62	99	1.6	100	1.5
Cobalt	U	1.0	U	1.5	U	1.4	U	1.2	U	3.3	U	3.0
Copper	U	1.0	2.8	1.5	5.0	1.4	2.8	1.2	17	3.3	25	3.0
Iron	U	7.5	6000	11	11000	10	4500	9.3	30000	25	32000	23
Lead	U	5.0	U	7.3	12	6.9	U	6.2	55	16	21	15
Magnesium	U	5.0	1300	7.3	2300	6.9	970	6.2	6900	16	7100	15
Manganese	U	0.25	120	0.37	180	0.34	140	0.31	400	0.82	380	0.76
Mercury	U	0.013	0.25	0.018	0.54	0.017	0.38	0.015	8.1	0.414	32	1.9
Nickel	U	1.5	4.2	2.2	6.6	2.1	2.5	1.9	18	4.9	21	4.6
Potassium	U	5.0	710	7.3	1500	6.9	580	6.2	3900	16	4300	15
Selenium	U	0.20	U	7.3	U	6.9	U	6.2	U	16	U	15
Silver	U	0.50	U	0.74	U	0.69	U	0.61	U	1.6	U	1.5
Sodium	U	5.0	3400	7.3	4700	6.9	2500	6.2	16000	16	15000	15
Thallium	U	0.20	U	0.29	U	0.28	U	0.25	U	0.65	U	0.61
Vanadium	U	0.75	14	1.1	29	1.0	11	0.93	66	2.5	82	2.3
Zinc	U	0.50	14	0.73	28	0.69	14	0.62	72	1.6	88	1.5

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	Blank		B 119-SED		B 120-SED		B 121-SED	
Location			South Marsh 119		North Marsh 120		North Marsh 121	
% Solids	100		29		25		24	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL. mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	U	4.0	24000	14	31000	16	32000	16
Antimony	U	4.0	U	14	U	16	U	16
Arsenic	U	0.008	12	1.4	9.6	1.6	13	1.6
Barium	U	0.40	31	1.4	67	1.6	36	1.6
Beryllium	U	0.08	1.1	0.27	1.1	0.32	1.2	0.32
Cadmium	U	0.20	U	0.68	U	0.79	U	0.81
Calcium	U	16	3500	55	4500	63	3200	65
Chromium	U	0.40	97	1.4	61	1.6	160	1.6
Cobalt	U	0.8	U	2.7	U	3.2	U	3.3
Copper	U	0.8	14	2.7	39	3.2	21	3.3
Iron	U	6.0	25000	21	32000	24	31000	24
Lead	U	4.0	34	14	89	16	50	16
Magnesium	U	4.0	6400	14	7000	16	6900	16
Manganese	U	0.20	400	0.68	200	0.79	230	0.81
Mercury	U	0.013	NR	NA	NR	NA	NR	NA
Nickel	U	1.2	18	4.1	24	4.7	24	4.9
Potassium	U	4.0	3200	14	3500	16	3500	16
Selenium	U	4.0	U	14	U	16	U	16
Silver	U	0.50	U	1.7	U	1.9	U	2.0
Sodium	U	4.0	14000	14	11000	16	14000	16
Thallium	U	0.16	U	0.55	U	0.63	U	0.65
Vanadium	U	0.60	58	2.1	73	2.4	66	2.4
Zinc	U	0.40	71	1.4	210	1.6	94	1.6

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	Blank		B 117-SED		B 118-SED		100-SED	
Location			Outfall Purvis Creek 117		South Marsh 118		Purvis Creek	
% Solids	100		33		31		37	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	U	4.0	43000	12	44000	13	22000	11
Antimony	U	4.0	U	12	U	13	U	11
Arsenic	U	0.008	14	1.2	14	1.3	5.3	1.1
Barium	U	0.40	44	1.2	40	1.3	23	1.1
Beryllium	U	0.08	1.5	0.24	1.3	0.26	0.6	0.22
Cadmium	U	0.20	U	0.61	U	0.65	U	0.54
Calcium	U	16	6200	48	3800	52	2400	44
Chromium	U	0.40	70	1.2	72	1.3	53	1.1
Cobalt	U	0.8	U	2.4	U	2.6	U	2.2
Copper	U	0.8	18	2.4	19	2.6	9.9	2.2
Iron	U	6.0	36000	18	31000	19	15000	16
Lead	U	4.0	39	12	34	13	25	11
Magnesium	U	4.0	7500	12	6700	13	3900	11
Manganese	U	0.20	500	0.61	310	0.65	170	0.54
Mercury	U	0.013	NR	NA	NR	NA	2.5	0.34
Nickel	U	1.2	25	3.6	25	3.9	13	3.3
Potassium	U	4.0	4000	12	3600	13	1900	11
Selenium	U	4.0	U	12	U	13	U	11
Silver	U	0.50	U	1.5	U	1.6	U	2.7
Sodium	U	4.0	13000	12	12000	13	9700	11
Thallium	U	0.16	U	0.48	U	0.52	U	0.44
Vanadium	U	0.60	83	1.8	82	1.9	35	1.6
Zinc	U	0.40	83	1.2	78	1.3	46	1.1

Table 1.10 (Cont) Results of the Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	Blank		C113104		C 113106		C 113108		C 113110	
Location			H1 0-6		H1 12-18		H2 0-6		H2 12-18	
% Solids	100		20		26		23		21	
Analyte	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg	Conc mg/kg	MDL mg/kg
Aluminum	U	4.0	24000	20	36000	14	34000	17	36000	19
Antimony	U	0.16	U	20	U	14	U	17	U	19
Arsenic	U	0.008	4.7	2.0	4.0	1.4	5.5	1.7	6.3	1.9
Barium	U	0.40	51	2.0	35	1.4	47	1.7	36	1.9
Beryllium	U	0.06	0.88	0.41	1.4	0.29	1.2	0.34	1.4	0.38
Cadmium	U	0.20	U	1.0	U	0.71	U	0.85	U	0.95
Calcium	U	16	19000	81	3100	57	26000	68	5600	76
Chromium	U	0.40	56	2.0	46	1.4	71	1.7	47	1.9
Cobalt	U	0.8	U	4.1	U	2.9	U	3.4	U	3.8
Copper	U	0.8	46	4.1	34	2.9	44	3.4	27	3.8
Iron	U	6.0	15000	31	22000	21	21000	26	25000	29
Lead	U	4.0	280	20	650	14	220	17	280	19
Magnesium	U	4.0	6900	20	6000	14	8600	17	6400	19
Manganese	U	0.20	110	1.0	110	0.71	180	0.85	150	0.95
Mercury	U	0.013	420	63	0.79	0.045	370	27	30	0.60
Nickel	U	1.2	27	6.1	16	4.3	29	5.1	18	5.7
Potassium	U	4.0	2300	20	2900	14	2500	17	2900	19
Selenium	U	0.16	U	20	U	14	U	17	U	19
Silver	U	0.50	U	2.6	U	1.8	U	2.2	U	2.4
Sodium	U	4.0	22000	20	14000	14	21000	17	34000	19
Thallium	U	0.16	U	0.81	U	0.57	U	0.68	U	0.76
Vanadium	U	0.60	87	3.1	61	2.1	79	2.6	63	2.9
Zinc	U	0.40	190	2.0	110	1.4	160	1.7	88	1.9

Table 1.11 Results of the Analysis for Mercury in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	Location	% Solids	Mercury mg/kg	MDL mg/kg
Blank		100	U	0.013
B 1-SEDREF	Little Satilla	24	0.13	0.053
B 104-SED	Purvis Creek	27	1.34	0.049
B 105-SED	Purvis Creek	27	0.82	0.047
B 106-SED	Purvis Creek	22	0.90	0.061
B 107-SED	Purvis Creek	32	0.99	0.043
B 113039	Turtle River US 0-6 108	25	0.63	0.052
B 113040	Turtle River 24-30 108	29	0.31	0.043
B 113042	Turtle River 48-54 108	39	0.06	0.035
B 113043	Gibson Creek 0-6 109	25	0.70	0.050
B 113044	Gibson Creek 18-24 109	38	0.20	0.035
B 113047	Gibson Creek 48-54 109	37	0.05	0.034
B 113048	H3 0-12	23	220	5.4
A 113051	H3 30+	32	0.40	0.040
Blank		100	U	0.013
B 113073	J1 0-6	20	280	6.3
B 113074	L1 0-6	68	7.0	0.18
B 113076	L1 12-18	71	1.1	0.18
B 113077	F2 0-6	22	410	58
B 113079	F2 12-18	32	84	3.9
B 113081	F2 24-30	34	73	3.7
B 113082	E3 0-6	19	170	6.6
B 113084	E3 12-18	25	200	5.1
B 113086	E3 24-30	26	450	48
B 113089	B2 0-6	29	47	4.4
B 113091	B2 12-18	32	0.73	0.038
B 113093	H4 0-6	21	91	5.9
B 113095	H4 12-18	25	100	4.9
B 113097	H4 24-30	26	1.4	0.047
B 113098	B1 0-6	29	15	0.43
B 113100	B1 12-18	26	33	4.9
B 113102	B1 24-30	37	0.42	0.034
Blank		100	U	0.013
B 113104	H1 0-6	35	330	36
B 113106	H1 12-18	33	190	7.6
B 113108	H2 0-6	23	330	11
B 113110	H2 12-18	32	8.7	0.39
Blank		100	U	0.013
B 113113	Purvis Creek 0-6 110	73	0.09	0.017
B 113115	Purvis Creek 12-18 110	61	0.59	0.021
B 113117	Purvis Creek 24-30 110	53	0.69	0.024
B 113119	Drainage Channel 0-6 114	30	12	1.1
B 113121	Drainage Channel 12-18 11	32	39	1.9
B 117-SED	Outfall Purvis Creek 117	33	3.6	0.38
B 118-SED	South Marsh 118	31	3.3	0.41
B 119-SED	South Marsh 119	29	2.5	0.42
B 120-SED	North Marsh 120	25	13	0.51
B 121-SED	North Marsh 121	24	6.4	0.54
B 122-SED	Turtle River 122	41	0.08	0.031

Table 1.11 (Cont) Results of the Analysis for Mercury in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	Location	% Solids	Mercury mg/kg	MDL mg/kg
Blank		100	U	0.013
113001	D4	23	85	3.0
113002	E4	10	24	4.0
113003	F4	8	41	5.0
113004	G4	12	43	3.5
113005	H4	16	120	3.1
113006	I4	12	78	3.6
113007	J4	11	36	3.8
113008	A5	36	14	1.8
113009	A7	53	3.0	0.24
113010	B4	32	24	2.0
113011	B6	40	4.7	0.31
113012	B7	51	7.2	1.2
113013	C5	33	13	1.9
113014	E5	30	14	0.46
113015	G5	37	13	0.34
113016	I5	35	25	1.8
113017	K5	29	22	2.1
113018	M5	58	11	1.1
113019	E7	45	6.0	0.28
113020	G7	52	6.0	0.24
101-SED	Purvis Creek	33	0.91	0.04
102-SED	Purvis Creek	42	1.2	0.03
103-SED	Purvis Creek	36	1.4	0.04

Table 1.12 Results of the Analysis for Mercury in Spartina Grass
WA# 0-113 LCP Chemical Site
Based on Dry Weight

Parameter:			Mercury	
Client ID	Tissue Type	Sample Location	Conc ug/kg	MDL ug/kg
Method Blank	------	Lab	U	40
A 113052	Spartina Grass	Little Satilla	U	110
A 113053	Spartina Grass	Little Satilla	U	140
A 113054	Spartina Grass	Little Satilla	U	120
A 113055	Spartina Grass	Little Satilla	U	98
A 113056	Spartina Grass	Little Satilla	U	110
A 113057	Spartina Grass	Little Satilla	U	95
A 113058	Spartina Grass	Little Satilla	U	110

Table 1.13 Results of the Analysis for Mercury in Brown Shrimp
WA# 0-113 LCP Chemical Site
Based on Dry Weight

Parameter:			Mercury	
Client ID	Tissue Type	Sample Location	Conc ug/kg	MDL ug/kg
Method Blank	------	Lab	U	40
A 113059	Brown Shrimp	Little Satilla	130	130
A 113060	Brown Shrimp	Little Satilla	130	130
A 113061	Brown Shrimp	Little Satilla	U	190
A 113062	Brown Shrimp	Little Satilla	U	160
A 113063	Brown Shrimp	Little Satilla	U	150
A 113064	Brown Shrimp	Little Satilla	U	170
A 113065	Brown Shrimp	Little Satilla	160	150
Method Blank	-----	Lab	U	40
A113130	Brown Shrimp	NA	690	140
A113131	Brown Shrimp	NA	720	110
A113132	Brown Shrimp	NA	730	140
A113133	Brown Shrimp	NA	960	130
A113134	Brown Shrimp	NA	960	150
A113135	Brown Shrimp	NA	830	150
A113136	Brown Shrimp	NA	740	140

Purvis Creek - DS

Table 1.14 Results of the Analysis for Mercury in Blue Claw Crabs
WA# 0–113 LCP Chemical Site
Based on Dry Weight

Parameter:			Mercury	
Client ID	Tissue Type	Sample Location	Conc ug/kg	MDL ug/kg
Method Blank	-----	Lab	U	40
A 113066	Blue Claw Crab	Little Satilla	150	97
A 113067	Blue Claw Crab	Little Satilla	220	92
A 113068	Blue Claw Crab	Little Satilla	120	98
A 113069	Blue Claw Crab	Little Satilla	U	140
A 113070	Blue Claw Crab	Little Satilla	200	150
A 113071	Blue Claw Crab	Little Satilla	170	120
A 113072	Blue Claw Crab	Little Satilla	140	110
Method Blank	-----	Lab	U	40
A113158	Blue Claw Crab	NA	2100	98
A113159	Blue Claw Crab	NA	6300	220
Method Blank	-----	Lab	U	40
A113153	Blue Claw Crab	NA	7900	180
A113154	Blue Claw Crab	NA	2800	100
A113155	Blue Claw Crab	NA	4000	110
A113156	Blue Claw Crab	NA	3300	180
A113157	Blue Claw Crab	NA	2600	100

~~E~~ Fctt - DS
Purvis Creek (Mule)

Table 1.15 Results of the Analysis for Mercury in Fiddler Crabs
WA# 0-113 LCP Chemical Site
Based on Dry Weight

Parameter:			Mercury	
Client ID	Tissue Type	Sample Location	Conc ug/kg	MDL ug/kg
Method Blank	-----	Lab	U	40
A113137	Fiddler Crab	NA	2900	150
A113138	Fiddler Crab	NA	2000	100
A113139	Fiddler Crab	NA	1900	80
A113140	Fiddler Crab	NA	1800	110
A113141	Fiddler Crab	NA	2100	70
A113142	Fiddler Crab	NA	3000	120
A113143	Fiddler Crab	NA	1900	77
A113144	Fiddler Crab	NA	1700	76
A113145	Fiddler Crab	NA	2100	91
A113146	Fiddler Crab	NA	1900	93
A113147	Fiddler Crab	NA	1500	83
A113148	Fiddler Crab	NA	1600	100
A113149	Fiddler Crab	NA	1600	95
A113150	Fiddler Crab	NA	U	85
A113151	Fiddler Crab	NA	U	82
A113152	Fiddler Crab	NA	78	74

Table 1.16 Results of the Analysis for Mercury, % Moisture and % Lipids in Whole Body Rat (SWRI)
WA# 0-113 LCP Chemical Site
(mercury result is based on dry weight)

Parameter:					Mercury	
Client ID	Tissue Type	Sample Location	% Moisture	% Lipids	Conc ug/kg	MDL ug/kg
Blank		–			U	10
113200	Whole Body Rat	Whole Body	70	2.5	300	10
113201	Whole Body Rat	Whole Body	70	3.0	140	9.5

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Table 1.17 Results of the Analysis for Mercury in Carbon Dioxide
WA# 0–113 LCP Chemical Site

Parameter:		Mercury	
Client ID	Sample Location	Conc ug	MDL ug
Method Blank	Lab	U	40
CO2 Blank *	Tissue Lab	U	0.02
Method Blank	Lab	U	40
CO2 Blank *	Tissue Lab	U	0.02

* the results are reported as ug/sample

Table 1.18 Results of the Analysis for Total Petroleum Hydrocarbons in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	Location	% Solids	Total Petroleum Hydrocarbons mg/kg	MDL mg/kg
Blank (1107S)	–	100	U	3
100-SED	Purvis Creek	37	U	
111-SED	Drainage Channel	32	U	9.2
112-SED	Purvis Creek	44	U	6.8
113-SED	Main Tributary	32	42	9.2
115-SED	Main Tributary	29	20	10
116-SED	Main Tributary	32	37	9.3
106-SED	Purvis Creek	22	51	26
113077	F2 0-6	22	180	27
113081	F2 24-30	34	290	18
Blank (1107)	–	100	U	3
113113	Purvis Creek 0-6 110	68	44	8.4
113119	Drainage Channel 0-6 114	30	88	19
117-SED	Outfall Purvis Creek 117	33	41	8.9
118-SED	South Marsh 118	31	150	9.6
119-SED	South Marsh 119	29	61	10
120-SED	North Marsh 120	24	62	12
Blank (1020S2)	–	100	U	3
113035	Gnd Marsh	30	180	19
113036	Process south	87	100	3.5
113037	Cell bldg	90	100	3.3
113047	Gibson Creek 48-54 109	39	50	7.7
Blank (1107)	–	100	U	3
121-SED	North Marsh 121	24	56	12

Table 1.19 Results of the Analysis for Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans (SWRI)
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID	Blank		A 04456		A 04471		B 04446		B 04452	
Location			H-1		E-3		61		68	
Matrix	Sediment		Sediment		Sediment		Sediment		Sediment	
Units	ng/kg		ng/kg		ng/kg		ng/kg		ng/kg	
Analyte	Result		Result	MDL	Result	MDL	Result	MDL	Result	MDL
2,3,7,8-TCDD	0.332		7.32		14.6		29.3		20.6	
1,2,3,7,8-PeCDD	0.442		15.4	EMPC	12.18	EMPC	8.6 EMPC		7.74	
1,2,3,4,7,8-HxCDD	0.400		61.1		48.8		42.6		24.3	
1,2,3,6,7,8-HxCDD	0.604		91.6		52.5		57.3		48.7	
1,2,3,7,8,9-HxCDD	0.784		54.4		50.6		38.9		48.2	
1,2,3,4,6,7,8-HpCDD	2.31		3480		2410		2140		2140	
OCDD	10.5		22000		14000		13100		14800	
2,3,7,8-TCDF	0.330		9660		3510		2300		682	
1,2,3,7,8-PeCDF	0.364		26100		7280		5050		1240	
2,3,4,7,8-PeCDF	0.202		6100		2590		1670		401	
1,2,3,4,7,8-HxCDF	0.364		49300		20800		11900		2640	
1,2,3,6,7,8-HxCDF	0.436		15700		5640		2770		734	
1,2,3,7,8,9-HxCDF	0.556		661		349		270		387	
2,3,4,6,7,8-HxCDF	0.330		7790		3020		600		384	
1,2,3,4,6,7,8-HpCDF	0.562		92200		43500		21000		4860	
1,2,3,4,7,8,9-HpCDF	0.564	EMPC	15700		6050		3800		608	
OCDF	1.31		75900		39100		22200		3960	
TCDDs (Total)	0.332	NA	85.8	NA	94.2	NA	161	NA	110	NA
PeCDDs (Total)	0.542	NA	58.4	NA	154	NA	167	NA	182	NA
HxCDDs (Total)	2.04	NA	1270	NA	990	NA	968	NA	1040	NA
HpCDDs (Total)	3.47	NA	7190	NA	5890	NA	5110	NA	7210	NA
TCDFs (Total)	0.334	NA	55200	NA	23300	NA	11000	NA	5240	NA
PeCDFs (Total)	0.566	NA	84500	NA	30200	NA	17300	NA	6890	NA
HxCDFs (Total)	1.85	NA	137000	NA	54400	NA	31200	NA	11600	NA
HpCDFs (Total)	0.562	NA	155000	NA	72200	NA	40700	NA	13160	NA

Table 1.19 (Cont) Results of the Analysis for Chlorinated Dibenzodioxins
and Chlorinated Dibenzofurans
WA # 0-113 LCP Chemical Site
(SWRI)
(based on dry weight)

Sample ID	Blank		C 03875		C 03877	
Location			17-18		36	
Matrix	Sediment		Sediment		Sediment	
Units	ng/kg		ng/kg		ng/kg	
Analyte	Result	MDL	Result	MDL	Result	MDL
2,3,7,8-TCDD	0.332		7.83		15.9	
1,2,3,7,8-PeCDD	0.442		4.93	EMPC	4.88	EMPC
1,2,3,4,7,8-HxCDD	0.400		41.4		12.8	
1,2,3,6,7,8-HxCDD	0.604		13.4	EMPC	92.7	
1,2,3,7,8,9-HxCDD	0.784		30.1		49.8	
1,2,3,4,6,7,8-HpCDD	2.31		798		1130	
OCDD	10.5		5770		6850	
2,3,7,8-TCDF	0.330		250		359	
1,2,3,7,8-PeCDF	0.364		293		676	
2,3,4,7,8-PeCDF	0.202		106		209	
1,2,3,4,7,8-HxCDF	0.364		700		1370	
1,2,3,6,7,8-HxCDF	0.436		192		413	
1,2,3,7,8,9-HxCDF	0.556		15.9		33	
2,3,4,6,7,8-HxCDF	0.330		120		185	
1,2,3,4,6,7,8-HpCDF	0.562		1210		2000	
1,2,3,4,7,8,9-HpCDF	0.564	EMPC	187		372	
OCDF	1.31		1560		2870	
TCDDs (Total)	0.332	NA	49.8	NA	51.8	NA
PeCDDs (Total)	0.542	NA	81.4	NA	75.1	NA
HxCDDs (Total)	2.04	NA	588	NA	713	NA
HpCDDs (Total)	3.47	NA	3170	NA	4881	NA
TCDFs (Total)	0.334	NA	1320	NA	1245	NA
PeCDFs (Total)	0.566	NA	1380	NA	2262	NA
HxCDFs (Total)	1.85	NA	2160	NA	4099	NA
HpCDFs (Total)	0.562	NA	2330	NA	3992	NA

Table 1.19 (Cont) Results of the Analysis for Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans
WA # 0–113 LCP Chemical Site
(based on dry weight)
(ALTA)

Sample ID	Blank		113035		113036		113037	
Location			Grid Marsh		Process South		Cell Bldg	
Matrix	Soil		Soil		Soil		Soil	
% Solids	100		26		85		92	
Units	ng/kg		ng/kg		ng/kg		ng/kg	
Analyte	Result	MDL	Result	MDL	Result	MDL	Result	MDL
2,3,7,8–TCDD	U	0.19	7.4		1.5		2.2	
TCDDs (Total)	U	NA	15	NA	16	NA	18	NA
1,2,3,7,8–PeCDD	U	0.48	U	1.6	U	2.8	U	0.8
PeCDDs (Total)	U	NA	15	NA	19	NA	4.5	NA
1,2,3,4,7,8–HxCDD	U	0.73	4.0		13		5.0	
1,2,3,6,7,8–HxCDD	U	0.77	8.9		6.8		5.2	
1,2,3,7,8,9–HxCDD	U	0.70	8.2		5.0		1.8	
HxCDDs (Total)	U	NA	190	NA	190	NA	42	NA
1,2,3,4,6,7,8–HpCDD	U	0.27	170		110		56	
HpCDDs (Total)	U	NA	470	NA	410	NA	120	NA
OCDD	U	1.30	1600		370		380	
2,3,7,8–TCDF	U	0.38	220		53		99	
TCDFs (Total)	U	NA	1100	NA	940	NA	380	NA
1,2,3,7,8–PeCDF	U	0.65	170		130		190	
2,3,4,7,8–PeCDF	U	0.57	120		340		110	
PeCDFs (Total)	U	NA	860	NA	2900	NA	720	NA
1,2,3,4,7,8–HxCDF	U	0.22	240		3400		1200	
1,2,3,6,7,8–HxCDF	U	0.21	61		440		280	
2,3,4,6,7,8–HxCDF	U	0.20	52		1300		120	
1,2,3,7,8,9–HxCDF	U	0.24	53		71		99	
HxCDFs (Total)	U	NA	800	NA	13000	NA	2500	NA
1,2,3,4,6,7,8–HpCDF	U	0.62	260		12000		1700	
1,2,3,4,7,8,9–HpCDF	U	0.29	50		340		340	
HpCDFs (Total)	U	NA	540	NA	16000	NA	2800	NA
OCDF	1.3		390		5900		4100	

QA/QC for BNA in Soil

Before extraction, each sample was spiked with a six component mixture of CLP surrogate standards consisting of nitrobenzene-d_5, 2-fluorobiphenyl, terphenyl-d_{14}, phenol-d_5, 2-fluorophenol, and 2,4,6-tribromophenol. The surrogate percent recoveries, listed in Table 2.1, ranged from 44 to 121. All two hundred and seventy-six values were within the acceptable QC limits.

Samples 113037, 113117 and 116 SED were chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, ranging from 58 to 134, are listed in Table 2.2. Fifty-seven out of sixty-six values were within the acceptable QC limits. Thirty out of thirty-three relative percent differences were within the acceptable QC limits. The relative percent differences are also listed in Table 2.2.

Table 2.1 Results of the Surrogate Recoveries for BNA in Soil
WA # 0–113 LCP Chemical Site

Sample ID	S1 (2FP)	S2 (PHL)	S3 (NBZ)	S4 (FBP)	S5 (TBP)	S6 (TPH)	Total Out
Method–Blk (a0072.d)	89	87	112	114	94	96	0
113037–MS	84	87	96	103	107	101	0
113037–MSD	84	87	98	107	106	97	0
113035	99	99	98	102	112	97	0
113043	104	103	103	107	112	95	0
113044	104	108	105	110	110	95	0
113047	93	98	98	103	109	94	0
113036	105	110	104	113	110	97	0
113037	83	92	88	98	75	83	0
113104	95	97	95	102	108	93	0
113108	100	102	99	106	114	92	0
113110	104	110	104	110	121	93	0
113106	102	104	99	111	107	92	0
Method–Blk (a0099.d)	104	106	102	103	111	89	0
113048	80	87	89	100	96	91	0
113051	72	76	95	98	69	89	0
113093	81	89	94	104	69	102	0
113095	82	88	95	100	74	92	0
113097	83	89	102	104	82	94	0
113098	89	92	105	109	78	103	0
113100	77	79	103	104	53	97	0
113102	85	88	107	115	76	106	0
113117 -MS	84	90	101	103	69	95	0
113117–MSD	62	70	77	87	58	85	0
113113	70	69	91	97	44	96	0
113115	84	89	103	105	67	100	0
113117	84	89	101	104	43	96	0
113119	78	84	99	102	66	92	0
113121	73	80	97	101	79	96	0
Method–Blk (a0245.d)	106	108	92	97	101	97	0
111–SED	100	93	88	90	111	104	0
112–SED	96	94	88	90	115	103	0
113–SED	105	104	94	96	118	108	0
115–SED	98	104	90	93	116	107	0
116–SED	101	105	91	93	113	105	0
113077	100	101	91	93	112	104	0
113081	100	101	92	95	112	112	0
117–SED	95	100	87	88	107	103	0
118–SED	99	99	94	95	112	110	0
119–SED	100	100	91	95	116	108	0
120–SED	99	96	89	92	114	108	0
121–SED	106	101	97	98	112	110	0
100–SED	94	97	86	91	110	98	0
106–SED	97	98	85	90	103	96	0
116–SED MS	102	99	94	95	118	109	0
116–SED MSD	102	101	92	94	114	106	0

	QC Limits
S1 (2FP) = 2–Fluorophenol	25–121
S2 (PHL) = Phenol–d5	24–113
S3 (NBZ) = Nitrobenzene–d5	23–120
S4 (FBP) = 2–Fluorobiphenyl	30–115
S5 (TBP) = 2,4,6–Tribromophenol	19–122
S6 (TPH) = Terphenyl–d14	18–137

Table 2.2 Results of the MS/MSD Analysis for BNA in Soil
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID 113037

Parameter	MS Spike Added (ug/kg)	MSD Spike Added (ug/kg)	Sample Conc. (ug/kg)	MS Recov. (ug/kg)	% Rec	MSD Recov. (ug/kg)	% Rec	RPD	QC Limits RPD	QC Limits Rec.
Phenol	10500	10173	U	9030	86	8568	84	2	35	26-90
2-Chlorophenol	10500	10173	U	8925	85	8588	84	1	50	25-102
1,4-Dichlorobenzene	5250	5086	U	4410	84	4385	86	3	27	28-104
N-Nitroso-di-n-propylamine	5250	5086	U	5200	99	4937	97	2	38	41-126
1,2,4-Trichlorobenzene	5250	5086	U	4885	93	4828	95	2	23	38-107
4-Chloro-3-methylphenol	10500	10173	U	10285	98	9587	94	4	33	26-103
Acenapthene	5250	5086	U	5602	107	5593	110	3	19	31-137
4-Nitrophenol	10500	10173	U	10693	102	10589	104	2	50	11-114
2,4-Dinitrotoluene	5250	5086	U	5035	96 *	5133	101 *	5	47	28-89
Pentachlorophenol	10500	10173	U	12945	123 *	12397	122 *	1	47	17-109
Pyrene	5250	5086	390	6105	109	5690	104	4	36	35-142

Sample ID 113117

Parameter	MS Spike Added (ug/kg)	MSD Spike Added (ug/kg)	Sample Conc. (ug/kg)	MS Recov. (ug/kg)	% Rec	MSD Recov. (ug/kg)	% Rec	RPD	QC Limits RPD	QC Limits Rec.
Phenol	23400	24000	U	18954	81	15360	64	24	35	26-90
2-Chlorophenol	23400	24000	U	19188	82	14880	62	28	50	25-102
1,4-Dichlorobenzene	11700	12000	U	9828	84	6960	58	37 *	27	28-104
N-Nitroso-di-n-propylamine	11700	12000	U	11232	96	9840	82	16	38	41-126
1,2,4-Trichlorobenzene	11700	12000	U	10012	86	7920	66	26 *	23	38-107
4-Chloro-3-methylphenol	23400	24000	U	16380	70	15120	63	11	33	26-103
Acenapthene	11700	12000	U	11232	96	10320	86	11	19	31-137
4-Nitrophenol	23400	24000	U	24336	104	21600	90	14	50	11-114
2,4-Dinitrotoluene	11700	12000	U	10764	92 *	10080	84	9	47	28-89
Pentachlorophenol	23400	24000	U	23400	100	20880	87	14	47	17-109
Pyrene	11700	12000	U	10062	86	8880	74	14	36	35-142

Sample ID 116 SED

Parameter	MS Spike Added (ug/kg)	MSD Spike Added (ug/kg)	Sample Conc. (ug/kg)	MS Recov. (ug/kg)	% Rec	MSD Recov. (ug/kg)	% Rec	RPD	QC Limits RPD	QC Limits Rec.
Phenol	30400	29600	U	26448	87	25456	86	1	35	26-90
2-Chlorophenol	30400	29600	U	29184	96	28120	95	1	50	25-102
1,4-Dichlorobenzene	15200	14800	U	13680	90	13912	94	4	27	28-104
N-Nitroso-di-n-propylamine	15200	14800	U	15504	102	15392	104	2	38	41-126
1,2,4-Trichlorobenzene	15200	14800	U	14896	98	14504	98	0	23	38-107
4-Chloro-3-methylphenol	30400	29600	U	29184	96	27528	93	3	33	26-103
Acenapthene	15200	14800	U	15200	100	14208	96	4	19	31-137
4-Nitrophenol	30400	29600	U	31920	105	29304	99	6	50	11-114
2,4-Dinitrotoluene	15200	14800	U	14288	94 *	13616	92 *	2	47	28-89
Pentachlorophenol	30400	29600	U	40736	134 *	37888	128 *	5	47	17-109
Pyrene	15200	14800	U	17632	116	16872	114	2	36	35-142

QA/QC for PCBs in Soil

Each sample that was run at REAC was spiked with a surrogate solution of dibutyl chlorendate; percent recoveries ranged from 62 to 119 and are listed in Table 2.3. QC limits are not available for the percent recovery of dibutyl chlorendate when soil samples are analyzed for Aroclor 1268. The suggested limits for tetrachloro-m-xylene and decachlorobiphenyl for pesticides in soil samples are 60-150. If these suggested limits are used, all 94 samples would have been within the acceptable criteria.

Samples A 113012, A 113007, B 113037, A 113091, Blank 233 and A 113113 were chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses. Aroclor 1268 was added to the sample. The percent recoveries, ranging from 63 to 120, are listed in Table 2.4. The relative percent differences (RPDs) ranged from 3 to 27. QC limits are not available for the percent recoveries or RPDs for Aroclor 1268 in soil samples.

Each sample that was run at SWRI was spiked with a surrogate solution of tetrachloro-m-xylene and decachlorobiphenyl; percent recoveries ranged from 26 to 39 and are also listed in Table 2.3. All three samples exceeded the QC limits.

Table 2.3 Results of the Surrogate Recoveries for Aroclor 1268 in Soil WA # 0-113 LCP Chemical Site

Sample ID	Percent Recovery DCE
Blank 229	83
A 113008	69
A 113009	76
A 113010	76
A 113011	78
A 113012	72
A 113012 MS	73
A 113012 MSD	74
A 113013	82
A 113014	83
A 113015	85
A 113016	84
A 113017	72
A 113018	82
A 113019	86
A 113020	82
A 100-SED	79
A 101-SED	84
A 102-SED	85
A 103-SED	86
Blank 230	102
A 113001	106
A 113002	82
A 113003	83
A 113004	77
A 113005	80
A 113006	85
A 113007	91
A 113007 MS	69
A 113007 MSD	69

DCE denotes Dibutyl Chlorendate

	Advisory QC Limits
DCE	60-150

Table 2.3 (Cont) Results of the Surrogate Recoveries for Aroclor 1268 in Soil WA # 0-113 LCP Chemical Site

Sample ID	Percent Recovery DCE
Blank 231	76
A1-SEDREF	77
A104-SED	96
A105-SED	73
A106-SED	75
A107-SED	75
B 113035	76
B 113036	84
B 113037	72
B 113037 MS	79
B 113037 MSD	78
A 113039	80
A 113040	84
A 113042	77
A 113043	75
A 113044	78
A 113047	73
A 113048	73
B 113051	80
A 113073	82
A 113074	82
A 113076	88
A 113077	90
Blank 232	90
A 113079	96
A 113081	81
A 113093	78
A 113095	79
A 113097	77
A 113098	83
A 113100	81
A 113102	76
A 113082	84
A 113084	93
A 113086	85
A 113089	81
A 113091	106
A 113091 MS	67
A 113091 MSD	89
A 113104	87
A 113106	87
A 113108	109
A 113110	79

DCE denotes Dibutyl Chlorendate

	Advisory QC Limits
DCE	60-150

Table 2.3 (Cont) Results of the Surrogate Recoveries for Aroclor 1268 in Soil
WA # 0-113 LCP Chemical Site

Sample ID	Percent Recovery DCE
Blank 233	119
Blank 233 MS	101
Blank 233 MSD	88
A111-SED	75
A112-SED	75
A113-SED	64
A 113113	70
A 113113 MS	73
A 113113 MSD	78
A 113115	80
A 113117	74
A 113119	81
A 113121	72
A115-SED	73
A116-SED	75
A117-SED	69
A118-SED	74
A119-SED	73
A120-SED	62
A121-SED	73
A122-SED	71

DCE denotes Dibutyl Chlorendate

	Advisory QC Limits
DCE	60-150

Table 2.4 Results of the MS/MSD Analysis for Aroclor 1268 in Soil
WA # 0-113 LCP Chemical
Based on dry weight

Spike Compound Aroclor 1268

Sample ID	Sample Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MS % Rec	MSD Spike Added ug/kg	MSD Conc ug/kg	MSD % Rec	RPD
A 113012	4644	18182	18418	76	18182	19747	83	9
A 113007	15552	28701	46486	108	28701	45614	105	3
B 113037	53371	5593	58467	91	5593	60061	120	27
A 113091	5379	17493	16442	63	17493	19613	81	25
Blank 233	U	5000	4825	97	5000	4094	82	16
A 113113	253	6784	5330	75	6784	5667	80	6

QA/QC for PCBs in Tissue

Each sample was spiked with a surrogate solution of tetrachloro-m-xylene and decachlorobiphenyl; percent recoveries ranged from 40 to 151 and are listed in Table 2.5. Although QC limits are not available for Aroclor 1268 in tissue, twenty-one out of sixty-two values are within the advisory QC limits. The percent recoveries for decachlorobiphenyl were not calculated because it co-eluted with the last peak of Aroclor 1268.

Samples A 113056, A 113136, A 113131, A 113154 and A 113159 were chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses. Aroclor 1260 was added to the samples. The percent recoveries, ranging from 81 to 120, are listed in Table 2.6. Two percent recoveries were not calculated because of matrix interference. The relative percent differences (RPDs) ranged from 4 to 29. One relative percent difference was not calculated because of matrix interference. QC limits are not available for the percent recoveries or RPDs for Aroclor 1260 in tissue samples.

Table 2.5 Results of the Surrogate Recoveries for Aroclor 1268 in Tissue WA # 0-113 LCP Chemical Site

CLIENT ID	Percent Recovery TCMX	DCBP
METHOD BLANK 102195	47 *	NC
METHOD BLANK 102395	73	NC
METHOD BLANK 102495	73	NC
A113056 MS	53 *	NC
A113056 MSD	72	NC
A113131 MS	61	NC
A113131 MSD	63	NC
A113136 MS	151 *	NC
A113136 MSD	54 *	NC
A113154 MS	61	NC
A113154 MSD	54 *	NC
A113159 MS	58 *	NC
A113159 MSD	54 *	NC
A113052	46 *	NC
A113053	59 *	NC
A113054	47 *	NC
A113055	59 *	NC
A113056	53 *	NC
A113057	58 *	NC
A113058	45 *	NC
A113059	55 *	NC
A113060	48 *	NC
A113061	56 *	NC
A113062	47 *	NC
A113063	56 *	NC
A113064	47 *	NC
A113065	59 *	NC
A113066	55 *	NC
A113067	64	NC
A113068	56 *	NC
A113069	61	NC
A113070	66	NC
A113071	59 *	NC
A113072	65	NC

Tetrachloro-m-xylene (TCMX)
Decachlorobiphenyl (DCBP)

	Advisory QC Limits
Tetrachloro-m-xylene	60-150
Decachlorobiphenyl	60-150

Table 2.5 (Cont) Results of the Surrogate Recoveries
for Aroclor 1268 in Tissue
WA # 0-113 LCP Chemical Site

CLIENT ID	Percent Recovery TCMX	DCBP
A113137	58 *	NC
A113138	57 *	NC
A113139	53 *	NC
A113140	56 *	NC
A113141	53 *	NC
A113142	61	NC
A113143	61	NC
A113144	53 *	NC
A113145	70	NC
A113146	55 *	NC
A113147	70	NC
A113133	69	NC
A113132	58 *	NC
A113159	64	NC
A113130	58 *	NC
A113131	52 *	NC
A113151	63	NC
A113152	47 *	NC
A113134	56 *	NC
A113135	51 *	NC
A113153	57 *	NC
A113136	59 *	NC
A113154	61	NC
A113155	63	NC
A113156	62	NC
A113157	62	NC
A113158	47 *	NC
A113148	40 *	NC

Tetrachloro-m-xylene (TCMX)
Decachlorobiphenyl (DCBP)

	Advisory QC Limits
Tetrachloro-m-xylene	60-150
Decachlorobiphenyl	60-150

Table 2.6 Results of the MS/MSD Analysis for Aroclor 1260 in Tissue
WA#0-113 LCP Chemical
Based on dry weight

Spike Compound Aroclor 1260

Sample ID	Sample Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MS % Rec	MSD Spike Added ug/kg	MSD Conc ug/kg	MSD % Rec	RPD
A113056	U	342	278	81	342	374	109	29
A113136	U	498	574	115	496	593	120	4
A113131	U	475	412	87	475	474	100	14
A113154	U	395	419	106	393	397	101	5
A113159	U	401	814	MI	401	690	MI	NC

QA/QC for PCBs in Whole Body Rat Tissue

Each sample was spiked with a solution of tetrachloro-m-xylene and decachlorobiphenyl as surrogates. The percent recoveries ranged from 26 to 90 and are listed in Table 2.7. Seven values (for decachlorobiphenyl) were not calculated because the surrogate coeluted with interfering peaks. Although QC limits are not available for surrogates in tissue, three out of eleven values were within the advisory QC limits.

Sample 113200 was chosen for the matrix spike/matrix spike duplicate (MS/MSD) analyses. Aroclor 1254 was spiked to each sample; the percent recoveries were 60 and 52 and are listed in Table 2.8. The relative percent difference (RPD), also listed in Table 2.8, was 15. QC limits are not available for the percent recoveries or the RPDs for Aroclors in tissue samples

The blank was also spiked with Aroclor 1254 and the results are reported as a blank spike in Table 2.9. The percent recovery was 97.

Table 2.7 Results of the Surrogate Recoveries for PCBs In Whole Body Rat WA # 0-113 LCP Chemical Site

Sample ID	Percent Recovery TCMX	Percent Recovery DCBP
BLK	69	90
BLK MS	57 *	81
113200	43 *	NC
113200 MS	47 *	NC
113200 MSD	46 *	NC
113201	44 *	NC
Blank**	38 *	NC
113200**	26 *	NC
113201**	32 *	NC

** denotes that these are the extract samples on chain of custody 00189

TCMX denotes Tetrachloro-m-xylene
DCBP denotes Decachlorobiphenyl

	Advisory QC Limits
Tetrachloro-m-xylene	60-150
Decachlorobiphenyl	60-150

Table 2.8 Results of the MS/MSD Analysis for PCBs in Whole Body Rat
WA#0-113 LCP Chemical
Based on dry weight

Spike mixture: Aroclor 1254

Sample ID	Matrix	Sample Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MS % Rec	MSD Spike Added ug/kg	MSD Conc ug/kg	MSD % Rec	RPD
113200	Rat	117	1195	839	60	1243	785	52	15

Table 2.9 Results of the MS Analysis for PCBs
in Whole Body Rat
WA#0-113 LCP Chemical
Based on dry weight

Spike mixture: Aroclor 1254

Sample ID	Sample Conc ug/kg	Spike Added ug/kg	Conc ug/kg	% Rec
Blank	U	400	388	97

0113\DEL\AR\9601\PCBSWRI

QA/QC for Metals in Sediment

Samples A 111037, B 111-SED and C 113106 were chosen for matrix spike (MS) analyses. The percent recoveries, listed in Table 2.10, ranged from 80 to 112 and forty-nine out of forty-nine values were within the acceptable QC limits. Seven additional values were not calculated because the concentration of analyte spiked was less than that contained in the sample.

Samples A 111037, B 111-SED and C 113106 were chosen for the duplicate analyses. The relative percent differences, listed in Table 2.11, ranged from 0 (zero) to 30 and forty-eight out of forty-nine values were within the acceptable QC limits. Nineteen additional values were not calculated because the analyte was not detected in either analysis.

Table 2.10 Results of the Matrix Spike Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc mg/kg	Spike Conc mg/kg	Rec Conc mg/kg	% Rec	QC Limit
Aluminum	A 113037	1380	1110	2370	89	75-125
Antimony	A 113037	U	166.5	186	112	75-125
Arsenic	A 113037	0.41	27.75	22.6	80	75-125
Barium	A 113037	18.2	166.5	168	90	75-125
Beryllium	A 113037	U	27.75	25.6	92	75-125
Cadmium	A 113037	U	27.75	25.4	92	75-125
Chromium	A 113037	5.4	111	111	95	75-125
Cobalt	A 113037	U	555	533	96	75-125
Copper	A 113037	20.2	111	124	94	75-125
Iron	A 113037	2970	555	3080	NC	75-125
Lead	A 113037	14.7	111	120	95	75-125
Manganese	A 113037	20.4	277.5	280	94	75-125
Mercury	A 113037	14.5	0.2775	16.7	NC	75-125
Nickel	A 113037	6.3	111	109	93	75-125
Selenium	A 113037	U	111	99.8	90	75-125
Silver	A 113037	U	27.75	27.3	98	75-125
Thallium	A 113037	U	2.22	2.01	91	75-125
Vanadium	A 113037	3.12	555	511	92	75-125
Zinc	A 113037	34.8	111	137	92	75-125

Table 2.10 (Cont) Results of the Matrix Spike Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc mg/kg	Spike Conc mg/kg	Rec Conc mg/kg	% Rec	QC Limit
Antimony	B 111-SED	U	372	379	102	75-125
Arsenic	B 111-SED	10.9	62	61	81	75-125
Barium	B 111-SED	52.6	372	376	87	75-125
Beryllium	B 111-SED	1.65	62	59.7	94	75-125
Cadmium	B 111-SED	U	62	57.1	92	75-125
Chromium	B 111-SED	112	248	334	90	75-125
Cobalt	B 111-SED	U	1240	1190	96	75-125
Copper	B 111-SED	17.6	248	240	90	75-125
Lead	B 111-SED	36.3	248	270	94	75-125
Manganese	B 111-SED	416	620	1007	95	75-125
Nickel	B 111-SED	23.5	248	252	92	75-125
Selenium	B 111-SED	U	248	233	94	75-125
Silver	B 111-SED	U	77.5	78.3	101	75-125
Thallium	B 111-SED	U	4.96	4.46	90	75-125
Zinc	B 111-SED	82.1	248	310	92	75-125

Table 2.10 (Cont) Results of the Matrix Spike Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc mg/kg	Spike Conc mg/kg	Rec Conc mg/kg	% Rec	QC Limit
Aluminum	B 111-SED	57300	2480	52800	NC	75-125
Iron	B 111-SED	33100	2480	3800	NC	75-125
Vanadium	B 111-SED	84	1240	1200	90	75-125

Table 2.10 (Cont) Results of the Matrix Spike Analysis for Metals in Sediment
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc mg/kg	Spike Conc mg/kg	Rec Conc mg/kg	% Rec	QC Limit
Aluminum	C 113106	35900	2856	52100	NC	75-125
Antimony	C 113106	U	428.4	411	96	75-125
Arsenic	C 113106	4	71.4	68.7	91	75-125
Barium	C 113106	35.00	428.4	434	93	75-125
Beryllium	C 113106	1.42	71.4	66.9	92	75-125
Cadmium	C 113106	U	71.4	64.3	90	75-125
Chromium	C 113106	45.9	285.6	315	94	75-125
Cobalt	C 113106	U	1428	1320	92	75-125
Copper	C 113106	34.1	285.6	317	99	75-125
Iron	C 113106	22300	2856	27700	NC	75-125
Lead	C 113106	654	285.6	1230	NC	75-125
Manganese	C 113106	107	714	815	99	75-125
Mercury	C 113106	0.787	0.8925	1.74	107	75-125
Nickel	C 113106	16.1	285.6	281	93	75-125
Selenium	C 113106	U	285.6	262	92	75-125
Silver	C 113106	U	89.25	83.1	93	75-125
Thallium	C 113106	U	5.712	5.33	93	75-125
Vanadium	C 113106	60.7	1428	1410	94	75-125
Zinc	C 113106	107	285.6	357	88	75-125

Table 2.11 Results of the Duplicate Analysis
for Metals in Sediment
WA # 0-113 LCP Chemical Site

Sample ID A 113037

Metal	Initial Analysis mg/kg	Duplicate Analysis mg/kg	RPD	Control Limit
Aluminum	1380	1470	6	20
Antimony	U	U	NC	NA
Arsenic	0.41	0.43	5	20
Barium	18.2	17	7	20
Beryllium	U	U	NC	NA
Cadmium	U	U	NC	NA
Calcium	413	490	17	20
Chromium	5.4	5.84	8	20
Cobalt	U	U	NC	NA
Copper	20.2	20.5	1	20
Iron	2970	2840	4	20
Lead	14.7	12.3	18	20
Magnesium	207	214	3	20
Manganese	20.4	20.8	2	20
Mercury	14.5	17	16	20
Nickel	6.3	5.63	11	20
Potassium	83.3	76.8	8	20
Selenium	U	U	NC	NA
Silver	U	U	NC	NA
Sodium	228	221	3	20
Thallium	U	U	NC	NA
Vanadium	3.12	3.69	17	20
Zinc	34.8	39.6	13	20

Table 2.11 (Cont) Results of the Duplicate Analysis for Metals in Sediment WA # 0-113 LCP Chemical Site

Sample ID C 113106

Metal	Initial Analysis mg/kg	Duplicate Analysis mg/kg	RPD	Control Limit
Aluminum	35900	43200	18	20
Antimony	U	U	NC	NA
Arsenic	4.00	5.40	30 *	20
Barium	34.99	39.8	13	20
Beryllium	1.42	1.55	9	20
Cadmium	U	U	NC	NA
Calcium	3080	3120	1	20
Chromium	45.9	48.1	5	20
Cobalt	U	U	NC	NA
Copper	34.1	34.6	1	20
Iron	22300	24600	10	20
Lead	654	673	3	20
Magnesium	6020	6230	3	20
Manganese	107	129	19	20
Mercury	0.787	0.82	4	20
Nickel	16.1	18.3	13	20
Potassium	2900	3050	5	20
Selenium	U	U	NC	NA
Silver	U	U	NC	NA
Sodium	14400	14600	1	20
Thallium	U	U	NC	NA
Vanadium	60.7	69.4	13	20
Zinc	107	101	6	20

QA/QC for Mercury in Sediment

Samples B 113073, C 113106, 1-SEDREF, B 113113, B 113001 and B 113014 were chosen for the matrix spike (MS) analyses. The percent recoveries, listed in Table 2.12, ranged from 93 to 107 and all three values were within the acceptable QC limits. Three additional values were not calculated because the concentration of mercury spiked was less than that contained in the sample.

Samples B 113073, C 113106, 1-SEDREF, B 113113, B 113001 and B 113014 were chosen for the duplicate analyses. The relative percent differences, listed in Table 2.13, ranged from 4 to 24 and five out of six values were within the acceptable QC limits.

Table 2.12 Results of the Matrix Spike Analysis for Mercury in Sediment
WA # 0-113 LCP Chemical Site

Metal	Sample ID	Sample Conc mg/kg	Spike Conc mg/kg	Rec Conc mg/kg	% Rec	QC Limit
Mercury	B 113073	281	1.26	289	NC	75-125
Mercury	C 113106	0.787	0.892	1.74	107	75-125
Mercury	1-SEDREF	0.126	1.06	1.11	93	75-125
Mercury	B 113113	0.089	0.343	0.408	93	75-125
Mercury	B 113001	85	1.07	70.3	NC	75-125
Mercury	B 113014	13.7	0.84	15.2	NC	75-125

Table 2.13 Results of the Duplicate Analysis
for Mercury in Sediment
WA # 0–113 LCP Chemical Site

Metal	Sample ID	Initial Analysis mg/kg	Duplicate Analysis mg/kg	RPD	Control Limit
Mercury	1–SEDREF	0.126	0.118	7	20
Mercury	B 113113	0.069	0.065	6	20
Mercury	C 113106	0.787	0.82	4	20
Mercury	B 113073	281	220	24 *	20
Mercury	B 113001	85	77	10	20
Mercury	B 113014	13.7	14.5	6	20

QA/QC for Mercury in Tissue

QC standard TMMA #1 was used to check the accuracy of the calibration curve. The percent recoveries were 101 and 102 and both were within the 95% confidence limits. The recoveries are listed in Table 2.14.

Samples A 113054, A 113061, A 113066, A 113137, A 113130 and A 113156 were chosen for matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recoveries, listed in Table 2.15, ranged from 75 to 124. The relative percent differences (RPDs), also listed in Table 2.15 ranged from 1 to 27. QC limits do not exist for the percent recoveries or RPDs of mercury in tissue samples.

The results of the spike blank analysis are reported in Table 2.16. The percent recoveries were 100 and 103 and both were within the acceptable QC limits.

Table 2.14 Results of the QC Standard Analysis for Mercury in Tissue
WA# 0-113 LCP Chemical Site

Metal	Date Analyzed	Quality Control Standard	Conc Rec ug/l	True Value ug/l	95 % Confidence Interval	% Rec
Mercury	10/23/95	TMMA #1	2.01	2.00	1.40–2.49	101
Mercury	10/25/95	TMMA #1	2.03	2.00	1.40–2.49	102

Table 2.15 Results of the MS/MSD Analysis for Mercury in Tissue
WA# 0-113 LCP Chemical Site

Metal	Sample ID	Matrix	Sample Conc ug/kg	Original Conc Spike ug/kg	Original Conc Dup ug/kg	Recovered Conc Spike ug/kg	Recovered Conc Dup ug/kg	% Recovery Spike	% Recovery Dup	RPD
Mercury	A113054	Spartina Grass	25	920	1169	984	1257	104	105	1
Mercury	A113061	Brown shrimp	139	1695	1695	1746	1771	95	96	2
Mercury	A113066	Blue Claw Crab	151	1352	920	1535	1065	102	102	1
Mercury	A113137	Fiddler Crab	2873	2105	3810	4453	6610	75	98	27
Mercury	A113130	Brown shrimp	693	1279	1023	1969	1693	100	98	2
Mercury	A113156	Blue Claw Crab	3315	1808	1808	5552	5262	124	108	14

Table 2.16 Results of the Blank Spike Analysis
for Mercury in Tissue
WA# 0-113 LCP Chemical Site

Metal	Spiked Conc ug/l	Rec Conc ug/l	% Rec	QC Limits
Mercury	2.00	1.99	100	75-125
Mercury	2.00	2.05	103	75-125

QA/QC for Mercury in Whole Body Rat

Sample 113200 was chosen for matrix spike (MS) analyses. The percent recovery, listed in Table 2.17, was 117.

The results of the analysis of the laboratory control sample are reported in Table 2.18. The percent recovery was 89. QC limits are not available for this analysis.

The results of the duplicate analysis are reported in Table 2.19. The relative percent difference was 8.

Table 2.17 Results of the MS Analysis for Whole Body Rat (SWR8)
WA# 0-113 LCP Chemical Site
on an as received basis

Metal	Sample ID	Matrix	Sample Conc ug/kg	Spike Conc ug/kg	Rec Conc ug/kg	% Rec Spike
Mercury	113200	Whole Body Rat	297.05	45.45	350.45	117

Table 2.18 Results of the Analysis of the Laboratory Control Sample (SWRI)
WA# 0-113 LCP Chemical Site

Metal	True Value mg/kg	Analyzed Value mg/kg	% Rec
Mercury	64.0	57.1	89

Table 2.19 Results of the Duplicate Analysis
for Mercury in Whole Body Rat
WA # 0-113 LCP Chemical Site

Analyte	Sample	Initial Analysis ug/kg	Duplicate Analysis ug/kg	RPD
Mercury	113200	257.05	321.05	6

QA/QC for Moisture in Whole Body Rat

The results of the duplicate analysis are reported in Table 2.20. The relative percent difference was 0 (zero).

Table 2.20 Results of the Duplicate Analysis
for Moisture in Whole Body Rat
WA # 0–113 LCP Chemical Site

Analyte	Sample	Initial Analysis %	Duplicate Analysis %	RPD
Moisture	113200	70.3	70.4	0

QA/QC for Total Petroleum Hydrocarbons

REAC samples 116-SED and 113037 and non-REAC sample 2518-001 were chosen for matrix spike (MS) analyses. The percent recoveries, listed in Table 2.21, were 97 and 115. The percent recovery for the non-REAC sample was not calculated because the concentration of total petroleum hydrocarbon in the sample was greater than the concentration spiked. Both calculated percent recoveries were within the acceptable QC limits.

REAC samples 116-SED and 113037 and non-REAC sample 2518-001 were chosen for the duplicate analyses. The relative percent differences, listed in Table 2.22, ranged from 1 to 15. All three relative percent differences were within the acceptable QC limits.

Table 2.21 Results of the Matrix Spike Analysis for TPH in Sediment
WA # 0-113 LCP Chemical Site
(based on dry weight)

Analyte	Sample ID	Sample Conc mg/kg	Spike Conc mg/kg	Rec Conc mg/kg	% Rec	Control Limit
TPH	116-SED	36.5	420.33	445	97	75-125
TPH	113037	110	147.30	279	115	75-125
TPH	2518-001*	3480	134.8	4780	NC	75-125

* denotes that this is a non-REAC sample

Table 2.22 Results of the Duplicate Analysis for TPH in Sediment WA # 0-113 LCP Chemical Site

Analyte	Sample ID	Initial Analysis mg/kg	Duplicate Analysis mg/kg	RPD	Control Limit
TPH	116-SED	36.5	42.5	15	20
TPH	113037	110	104	6	20
TPH	2518-001*	3480	3530	1	20

* denotes that this is a non-REAC sample

QA/QC for Dioxin (SWRI)

Before extraction, each sample was spiked with an internal standard mixture. The percent recovery of the internal standards ranged from 61 to 113. The results of the analysis are listed in Table 2.23. All sixty-three percent recoveries were within the acceptable QC limits.

Sample B 04452 was chosen for the matrix spike/matrix spike duplicate (MS/MSD) analysis. The percent recoveries, listed in Table 2.24, ranged from 34 to 112. Eight out of ten values were within the acceptable QC limits. Twenty-four values were not calculated because the concentrations spiked were less than those contained in the sample. The RPDs, also listed in Table 2.24, ranged from 3 to 107. Two out of five calculated values were within the acceptable QC limits. Twelve values were not calculated because the concentrations spiked were less than those contained in the sample.

Table 2.23 Results of the Internal Standard Recoveries for Polychlorinated Dibenzo-dioxins and Polychlorinated Dibenzofurans in Sediment (SWRI)
WA # 0-113 LCP Chemical Site

Sample ID	Blank	A 04456	A 04471	B 04446	B 04452	C 03875	C 03877
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Units	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Internal Standard							
13C-2,3,7,8-TCDD	69	73	75	75	78	83	76
13C-1,2,3,6,7,8-HxCDD	76	87	73	83	74	82	76
13C-2,3,7,8-TCDF	71	74	72	80	63	82	61
13C-1,2,3,4,7,8-HxCDF	89	90	69	84	69	78	73
13C-1,2,3,7,8-PeCDD	82	94	86	100	82	102	75
13C-1,2,3,4,6,7,8-HpCDD	80	108	76	99	85	90	83
13C-1,2,3,7,8-PeCDF	102	83	85	91	80	93	79
13C-1,2,3,4,6,7,8-HpCDF	82	84	65	82	69	80	75
13C-OCDD	94	113	79	97	92	97	98

QC Limit

40-120

Table 2.24 Results of the MS/MSD Analysis
for Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans in Sediment
(SWRI)
WA # 0-113 LCP Chemical Site
(based on dry weight)

Sample ID B 04452

Parameter	Sample ng/kg	Spike Added ng/kg	MS Recov. ng/kg	% Rec	MSD Recov. ng/kg	% Rec	RPD	QC Limits % Rec	QC Limits RPD
Dioxins									
Tetra (2,3,7,8)	20.6	64.5	71.2	78	72.7	81	3	60-140	20
Penta (1,2,3,7,8)	7.74	64.5	62.1	84	68.6	94	11	60-140	20
Hexa (1,2,3,4,7,8)	24.3	161	79.1	34 *	204	112	107 *	60-140	20
Hexa (1,2,3,6,7,8)	48.7	161	211	101	163	71	35 *	60-140	20
Hexa (1,2,3,7,8,9)	48.2	161	132	52 *	169	75	36 *	60-140	20
Hepta (1,2,3,4,6,7,8)	2140	161	1720	NC	1860	NC	NC	60-140	20
Octa (Total)	14800	323	11700	NC	12400	NC	NC	60-140	20
Furans									
Tetra (2,3,7,8)	682	64.5	581	NC	688.0	NC	NC	60-140	20
Penta (1,2,3,7,8)	1240	64.5	1000	NC	1030	NC	NC	60-140	20
Penta (2,3,4,7,8)	401	64.5	389	NC	430	NC	NC	60-140	20
Hexa (1,2,3,4,7,8)	2640	161	2230	NC	2560	NC	NC	60-140	20
Hexa (1,2,3,6,7,8)	734	161	724	NC	782	NC	NC	60-140	20
Hexa (1,2,3,7,8,9)	387	161	408	NC	188	NC	NC	60-140	20
Hexa (2,3,4,6,7,8)	384	161	406	NC	132	NC	NC	60-140	20
Hepta (1,2,3,4,6,7,8)	4860	161	3670	NC	4190	NC	NC	60-140	20
Hepta (1,2,3,4,7,8,9)	608	161	804	NC	721	NC	NC	60-140	20
Octa (Total)	3960	323	3630	NC	3520	NC	NC	60-140	20

QA/QC for Dioxin (Alta)

Before extraction, each sample was spiked with an internal standard mixture. The percent recovery of the internal standards ranged from 50 to 137. The results of the analysis are listed in Table 2.25. Sixty-nine out of seventy-two percent recoveries were within the acceptable QC limits.

Sample 113037 was chosen for the matrix spike/matrix spike duplicate (MS/MSD) analysis. The percent recoveries, listed in Table 2.26, ranged from 76 to 142. Twenty-five out of twenty-six values were within the acceptable QC limits. Eight values were not calculated because the concentrations spiked were less than those contained in the sample. The RPDs, also listed in Table 2.26, ranged from 0 (zero) to 47. Twelve out of thirteen values were within the acceptable QC limits. Four values were not calculated because the concentrations spiked were less than those contained in the sample.

The laboratory control sample was also spiked and run as an MS/MSD (LCS/LCSD) analysis. The percent recoveries, listed in Table 2.27, ranged from 100 to 124. The RPDs, also listed in Table 2.28, ranged from 0 (zero) to 5. QC limits are not available for this analysis.

Table 2.25 Results of the Internal Standard Recoveries
for Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans in Sediment and Soil
(ALTA)
WA # 0-113 LCP Chemical Site

Sample ID	Blank	113035	113036	113037	113037 MS	113037 MSD	LCS1	LCS2
Matrix	Soil	Sediment	Soil	Soil	Soil	Soil		
Units	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Internal Standard								
13C-2,3,7,8-TCDD	93	70	93	87	84	85	102	102
13C-1,2,3,7,8-PeCDD	92	65	89	75	82	82	120	129 *
13C-1,2,3,6,7,8-HxCDD	90	73	78	68	70	69	96	95
13C-1,2,3,4,6,7,8-HpCDD	90	74	72	74	86	86	84	83
13C-OCDD	86	71	65	65	78	73	76	74
13C-2,3,7,8-TCDF	89	73	77	82	102	85	105	103
13C-1,2,3,7,8-PeCDF	76	59	71	70	93	73	137 *	135 *
13C-1,2,3,4,7,8-HxCDF	86	70	70	74	82	79	101	101
13C-1,2,3,4,6,7,8-HpCDF	80	65	50	61	67	63	86	89

QC Limit

40-120

C113\DELIVAR\9601\DIOXIN

Table 2.28 Results of the MS/MSD Analysis for Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans in Sediment (ALTA) WA # 0-113 LCP Chemical Site (based on dry weight)

Sample ID 113037

Parameter	Sample pg/g	Spike Added pg/g	MS Recov. pg/g	% Rec	MSD Recov. pg/g	% Rec	RPD	QC Limits % Rec	QC Limits RPD
Dioxins									
Tetra (2,3,7,8)	2.2	21.82	23.2	96	22	91	6	60-140	20
Penta (1,2,3,7,8)	U	109.1	90.5	83	83.4	76	8	60-140	20
Hexa (1,2,3,4,7,8)	5.0	109.1	115	101	112	98	3	60-140	20
Hexa (1,2,3,6,7,8)	5.2	109.1	101	88	101	88	0	60-140	20
Hexa (1,2,3,7,8,9)	1.8	109.1	120	108	119	107	1	60-140	20
Hepta (1,2,3,4,6,7,8)	56	109.1	156	92	151	87	5	60-140	20
Octa (Total)	380	218.2	572	88	690	142 *	47 *	60-140	20
Furans									
Tetra (2,3,7,8)	99	21.82	117	82	121	101	20	60-140	20
Penta (1,2,3,7,8)	190	109.1	320	119	283	85	33	60-140	20
Penta (2,3,4,7,8)	110	109.1	219	100	201	83	18	60-140	20
Hexa (1,2,3,4,7,8)	1200	109.1	1610	NC	1500	NC	NC	60-140	20
Hexa (1,2,3,6,7,8)	280	109.1	458	163	427	135	19	60-140	20
Hexa (1,2,3,7,8,9)	120	109.1	262	130	244	114	14	60-140	20
Hexa (2,3,4,6,7,8)	99	109.1	216	107	207	99	8	60-140	20
Hepta (1,2,3,4,6,7,8)	1700	109.1	2130	NC	2107	NC	NC	60-140	20
Hepta (1,2,3,4,7,8,9)	340	109.1	715	NC	701	NC	NC	60-140	20
Octa (Total)	4100	218.2	4910	NC	5470	NC	NC	60-140	20

Table 2.27 Results of the Analysis of the Laboratory Control Sample for Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans in Sediment (ALTA)
WA # 0–113 LCP Chemical Site

Analyte	Spike Added	Spike Rec LCS1	% Rec LCS1	Spike Rec LCS2	% Rec LCS2	Average Percent Recovery	RPD
2,3,7,8–TCDD	20	20	100	20	100	100	0
1,2,3,7,8–PeCDD	100	110	110	110	110	110	0
1,2,3,4,7,8–HxCDD	100	110	110	108	108	109	2
1,2,3,6,7,8–HxCDD	100	108	108	105	105	107	3
1,2,3,7,8,9–HxCDD	100	108	108	107	107	108	1
1,2,3,4,6,7,8–HpCDD	100	110	110	108	108	109	2
OCDD	200	219	110	214	107	108	2
2,3,7,8–TCDF	20	22	110	21	105	108	5
1,2,3,7,8–PeCDF	100	122	122	122	122	122	0
2,3,4,7,8–PeCDF	100	120	120	119	119	120	1
1,2,3,4,7,8–HxCDF	100	111	111	110	110	111	1
1,2,3,6,7,8–HxCDF	100	115	115	113	113	114	2
2,3,4,6,7,8–HxCDF	100	110	110	109	109	110	1
1,2,3,7,8,9–HxCDF	100	112	112	109	109	111	3
1,2,3,4,6,7,8–HpCDF	100	114	114	111	111	113	3
1,2,3,4,7,8,9–HpCDF	100	115	115	111	111	113	4
OCDF	200	247	124	242	121	122	2

REAC, Ed   , NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: LCP CHEMICAL, GA
Project Number: 03347-040-001-0113
REW Contact: MARK HUSTON Phone: 9083214200

No: 00189

SHEET NO. 1 OF 1

12/11/95

Sample Identification / Analyses Requested

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	SOUTHWEST RESEACH #	DATE EXTRACTED	PCBs	(INCL. 1268)
	~~61831~~									
922	113200	NORTH 8	X1	10/20/95	1	4ml GLASS 4°C	61831	11/13/95	X	
923	113201	NORTH 14	X1	10/20/95	1		61832	11/13/95	X	
924	MB	BLANK	X1	—	1		BLANK	11/13/95	X	
925	*	BLANK MS	X1	—	1		BLANK MS	11/13/95	X	
926		MATRIX SPIKE	X1	—	1		MS 61831	11/13/95	X	
927		MATRIX S.D	X1	—	1		MSD 61831	11/13/95	X	
121195 920	113200	NORTH 8	X2	10/20/95	1	16oz GLASS 0°C	113200	—	ARCHIVE	
121195 921	113201	NORTH 14	X2	10/20/95	1	16oz AMBER 0°C	113201	—	ARCHIVE	

MB

Matrix:
SD - Sediment; DS - Drum Solids; DL - Drum Liquids; X - Other
PW - Potable Water; GW - Groundwater; SW - Surface Water; SL - Sludge
S - Soil; W - Water; O - Oil; A - Air

* see southwest research #

Special Instructions:
X1 = EXTRACT
X2 = HOMOGENATE

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All Analyses	Mark Huston	12/11/95	B Lewa	12/11/95	1350	1/ Analyses	B Lewa	12/11/95	Mark Bernick	12/11/95	14:15
						2/ Archive	B Lewa	12/11/95	Mark Bernick	12/11/95	14:15

8/94

00117

REAC, Jison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

C IN OF CUSTODY RECORD

Project Name LCP CHEMICAL SITE
Project Number 03347-040-001-0113-01
RFW Contact M. HUSTON Phone: (908) 321-4200

No: 00584

SHEET NO. 1 OF 1

02395

Sample Identification | Analyses Requested

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg			
003	CO2BOL-	HEI/TISSUE LAB	CO2	10/20/95	ONE	1-32oz/0°C	✓		YN	

YN

Matrix:

SD - Sediment	PW - Potable Water	S - Soil
DS - Drum Solids	GW - Groundwater	W - Water
DL - Drum Liquids	SW - Surface Water	O - Oil
X - Other	SL - Sludge	A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/analysis	J. Hensch	10/23/95	B Lewin	10/23/95	4:45	V [illegible]	B Lewin	10/23/95	[illegible]	10/24/95	9:40

00118

REAC, [illegible] NJ
(908) 321 4200
EPA Contract 68 C4 0022

CH[illegible] CUSTODY RECORD

Project Name LCP Chemical Site
Project Number 03347-040-01-0113-01
REW Contact John Johnson Phone (908) 321-4200

No: 01091

SHEET NO. 1 OF 1

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Dioxin		Intact	
	C03877	36	SD	13Jul95	1	8oz glass/4°C	✓			
	C03875	17-18								
	B04446	61		10Jul95						
	B04452	68								
	A04456	111								
	A04471	E-3								

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:

Cooler temp. is 12.5°C w/#5. J.H.Q

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY # 00941

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
6/analysis	[illegible]	7/20/95									

E4570028

REAC, E on, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CH OF CUSTODY RECORD

Project Name: LCP CHEMICAL SITE
Project Number: 03347-040-001-0113-01
RFW Contact: M. HUSTON Phone: (908) 321-4200

No: 09800

SHEET NO. 1 OF 1

162495

Sample Identification | **Analyses Requested**

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Hg			
019	CO2 BLK/MET.	TISSUE LAB	CO2	10/23/95	ONE	32 oz/0°C	X			

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

FOR SUBCONTRACTING USE ONl

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Ti
All/analysis	G. Vesuch	10/24/95	B Lewa	10/24/95	0820	1/Analysis	B Lewa	10/24/95	Collen Gr	10/24/95	9.

00120

EA650020

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USEPA

CHAIN OF CUS RECORD

COC # 011

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO#: 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road Brunswick, GA
Site Phone: 912-264-9533

Page No.: 1 of 2
Cooler #:004603
Lab: Integrated Analytic
Contact: Huston, Mark
908-321-4200

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
2345 .01	B	113001	D4	Sediment	10/16/95	8 oz glass/4 C	mercury	
2	B	113002	E4	Sediment	10/16/95	8 oz glass/4 C	mercury	
3	B	113003	F4	Sediment	10/16/95	8 oz glass/4 C	mercury	
4	B	113004	G4	Sediment	10/16/95	8 oz glass/4 C	mercury	
5	B	113005	H4	Sediment	10/16/95	8 oz glass/4 C	mercury	
6	B	113006	I4	Sediment	10/16/95	8 oz glass/4 C	mercury	
7	B	113007	J4	Sediment	10/16/95	8 oz glass/4 C	mercury	
8	B	113008	A5	Sediment	10/17/95	8 oz glass/4 C	mercury	
9	B	113009	A7	Sediment	10/17/95	8 oz glass/4 C	mercury	
10	B	113010	B4	Sediment	10/17/95	8 oz glass/4 C	mercury	
11	B	113011	B6	Sediment	10/17/95	8 oz glass/4 C	mercury	
12	B	113012	B7	Sediment	10/17/95	8 oz glass/4 C	mercury	
13	B	113013	C5	Sediment	10/17/95	8 oz glass/4 C	mercury	
14	B	113014	E5	Sediment	10/17/95	8 oz glass/4 C	mercury	
15	B	113015	G5	Sediment	10/17/95	8 oz glass/4 C	mercury	
16	B	113016	I5	Sediment	10/17/95	8 oz glass/4 C	mercury	
17	B	113017	K5	Sediment	10/17/95	8 oz glass/4 C	mercury	
18	B	113018	M5	Sediment	10/17/95	8 oz glass/4 C	mercury	
19	B	113019	E7	Sediment	10/17/95	8 oz glass/4 C	mercury	
20	B	113020	G7	Sediment	10/17/95	8 oz glass/4 C	mercury	

ES20015

0012

Special Instructions:

REFERENCE COC: 2345

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all analysis	Mark Huston	9/17/95	[illegible]	10/18/95	11:00 Am						

246

USEPA

CHAIN OF CUS RECORD

COC # 011

002
612

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO#: 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name LCP Chemical Site
Location 65 Ross Road Brunswick, GA
Site Phone 912-264-9533

Page No.: 2 of 2
Cooler #:004603
Lab: Integrated Analytic
Contact: Huston, Mark
908-321-4200

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
2345-21	B	100-SED	Purvis Creek	Sediment	10/17/95	8 oz glass/4 C	mercury	
22	B	101-SED	Purvis Creek	Sediment	10/17/95	8 oz glass/4 C	mercury	
23	B	102-SED	Purvis Creek	Sediment	10/17/95	8 oz glass/4 C	mercury	
24	B	103-SED	Purvis Creek	Sediment	10/17/95	8 oz glass/4 C	mercury	

ES200160

Special Instructions:

REFERENCE COC: 2345

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all analyses	Mark Huston	10/18/95	[illegible]	10/19/95	1100 am						

0012
24

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-003

REAC Edison NJ
Contact Huston Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name LCP Chemical Site
Location 65 Ross Road Brunswick, GA
Site Phone 912-264-9533

Page No.: 1 of 2
Cooler #:00480
Lab: Weston/REAC
Contact: Huston, Mark
908-321-4200

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
	A	113001	D4 Not Received gl	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113002	E4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113003	F4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113004	G4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113005	H4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113006	I4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113007	J4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113008	A5	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113009	A7	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113010	B4	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113011	B6	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113012	B7	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113013	C5	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113014	E5	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113015	G5	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113016	I5	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113017	K5	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113018	M5	Sediment	~~10/17/95~~ 10/17/95	4 oz glass/4 C	PCB	
	A	113019	E7	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	113020	G7	Sediment	10/17/95	4 oz glass/4 C	PCB	

Special Instructions: A113001 → A113007 not Received on the date
Recorded 10/19/95

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/analyses	Mark Huston	10/17/95	[illegible]	10/18/95	1400						

EAS80029

001.3

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-004

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road Brunswick, GA
Site Phone: 912 264-9533

Page No.: 2 of 2
Cooler #:00460
Lab: Weston/REAC
Contact: Huston, Mark
908-321-4200

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
	A	100-SED	Purvis Creek	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	101-SED	Purvis Creek	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	102-SED	Purvis Creek	Sediment	10/17/95	4 oz glass/4 C	PCB	
	A	103-SED	Purvis Creek	Sediment	10/17/95	4 oz glass/4 C	PCB	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/analyzed	[signature]	10/17/95	[signature]	10/18/95	1400						

001124

EAS0030

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-006

Page No.: 1 of 1

REAC Edison NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road Brunswick, GA
Site Phone: 912-264-9533

Cooler # 002390
Lab: Weston/REAC
Contact: Huston, Mark
908-321-4200

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
	A	113001	D4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113002	E4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113003	F4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113004	G4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113005	H4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113006	I4	Sediment	10/16/95	4 oz glass/4 C	PCB	
	A	113007	J4	Sediment	10/16/95	4 oz glass/4 C	PCB	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/analyses	Donna Getty	10/17/95	[illegible]	10/17/95	14:00						

EA580031

001.5

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-008

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road, Brunswick, GA
Site Phone: 912-264-9533

Page No.: 1 of 1
Cooler #:
Lab: Alta
Contact: Bob Mitzel
916-933-1640

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
	C	113035	Grid marsh	Sediment	10/18/95	4 oz glass/4 C	dioxin/furan	
	C	113036	Process south	Soil	10/18/95	4 oz glass/4 C	dioxin/furan	
	C	113037	Cell bldg	Soil	10/18/95	4 oz glass/4 C	dioxin/furan	

Special Instructions: Perform 8290 Analysis w/ MSMSD

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By ALTA	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
3/Analysis	[signature]	10/19/95	[signature] FedEx	10-20-95	1000	Analysis					

00120

EA63018

USEPA L..T

CHAIN OF CUSTODY RECORD

COC # 011. 1

111
GK

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road Brunswick, GA
Site Phone: 912-264-9533

Page No.: 1 of 2
Cooler #:004646
Lab: Weston/REAC
Contact: Huston, Mark
908-321-4200

102095

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments (weight)
√1945	A	113052	Little Satilla	marsh grass	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	282.4 g.
√1946	A	113053	Little Satilla	marsh grass	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	268 g
√1947	A	113054	Little Satilla	marsh grass	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	211 g
√1948	A	113055	Little Satilla	marsh grass	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	87.2 g
√1949	A	113056	Little Satilla	marsh grass	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	108.3 g
√1950	A	113057	Little Satilla	marsh grass	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	308.1 g
√1951	A	113058	Little Satilla	marsh grass	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	213.6 g
√1952	A	113059	Little Satilla	Brown Shrimp	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	29.7 g
√1953	A	113060	Little Satilla	Brown Shrimp	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	30.8 g
√1954	A	113061	Little Satilla	Brown Shrimp	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	29.1 g
√1955	A	113062	Little Satilla	Brown Shrimp	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	29.6 g
√1956	A	113063	Little Satilla	Brown Shrimp	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	31.2 g
√1957	A	113064	Little Satilla	Brown Shrimp	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	29.2 g
√1958	A	113065	Little Satilla	Brown Shrimp	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	30.9 g
√1959	A	113066	Little Satilla	BC Crab	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	102.4 g
√1960	A	113067	Little Satilla	BC Crab	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	91.5 g
√1961	A	113068	Little Satilla	BC Crab	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	28.8 g
√1962	A	113069	Little Satilla	BC Crab	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	95.2 g
√1963	A	113070	Little Satilla	BC Crab	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	146.5 g
√1964	A	113071	Little Satilla	BC Crab	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	67.4 g.

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
ALL/ANALYSIS	[signature]	10/19/95	B Lewa	10/20/95	1015	20/ Analyses	B Lewa	10/24/95	[signature]	10/24/95	1134
All/metals	Y. [signature]	10/23/95	B Lewa	10/23/95	0845	All/metals	B Lewa	10/23/95	[signature]	10/27/95	9:45

E4650014

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-..2

112
GK

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road Brunswick, GA
Site Phone: 912-264-9533

Page No.: 2 of 2
Cooler #:004645
Lab: Weston/REAC
Contact: Huston, Mark
908-321-4200

102095

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments (weight)
✓965	A	113072	Little Satilla	BC Crab	10/18/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	114 g.
		~~QC Blk~~	~~Met. Tissue Lab~~	~~BC~~	~~10/20/95~~	~~QC / Glass~~	~~Hg~~ Y. Nemsh	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/ANAL(-1)?)	[signature]	10/19/95	B Lewa	10/20/95	1015	1/Analysis	B Lewa	10/20/95	[signature]	10/20/95	1134
2/Analysis	Y. Nemsh	10/23/95	B Lewa	10/23/95	0845	1/Analysis	B Lewa	10/24/95	Jeustaff	10/24/95	9:40

001128

E4650015

USEPA ER

CHAIN OF CUSTODY RECORD

2318

COC # 0113-1

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO#: 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name LCP Chemical Site
Location 65 Ross Road Brunswick, GA
Site Phone 912-264-9533

Page No.: 1 of 2
Cooler #:002368
Lab: Integrated Analytic
Contact: Alan Balkin
201-361-4252

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
01	B	1-SEDREF	Little Satilla	Sediment	10/18/95	8 oz glass/4 C	mercury	
2	B	104-SED	Purvis Creek	Sediment	10/18/95	8 oz glass/4 C	mercury	
3	B	105-SED	Purvis Creek	Sediment	10/18/95	8 oz glass/4 C	mercury	
4	B	106-SED	Purvis Creek	Sediment	10/18/95	8 oz glass/4 C	mercury	
5	B	107-SED	Purvis Creek	Sediment	10/18/95	8 oz glass/4 C	mercury	
6	A	113035	Grid marsh	Sediment	10/18/95	32 oz glass/4 C	TAL metals, TPH, BNA	7 Day Rush
7	A	113036	Process south	Soil	10/18/95	32 oz glass/4 C	TAL metals, TPH, BNA	7 Day Rush
8	A	113037	Cell bldg	Soil	10/18/95	32 oz glass/4 C	TAL metals, TPH, BNA	7 Day Rush
9	B	113039	Turtle River US 0-6 108	Sediment	10/18/95	8 oz glass/4 C	mercury	
10	B	113040	Turtle River 24-30 108	Sediment	10/18/95	8 oz glass/4 C	mercury	
11	B	113042	Turtle River 48-54 108	Sediment	10/18/95	8 oz glass/4 C	mercury	
12	B	113043	Gibson Creek 0-6 109	Sediment	10/18/95	8 oz glass/4 C	mercury	
13	C	113043	Gibson Creek 0-6 109	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
14	B	113044	Gibson Creek 18-24 109	Sediment	10/18/95	8 oz glass/4 C	mercury	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/analyses	[illegible]	10/19/95	[illegible]	10/20/95	10:00						

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USEPA EF

CHAIN OF CUSTODY RECORD

2378

COC # 0113-11

Page No.: 2 of 2

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO#: 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name LCP Chemical Site
Location 65 Ross Road Brunswick, GA
Site Phone 912-264-9533

Cooler #:002366
Lab: Integrated Analytic
Contact: Alan Belkin
201-361-4252

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
15	C	113044	Gibson Creek 18-24 109	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
16	B	113047	Gibson Creek 48-54 109	Sediment	10/18/95	8 oz glass/4 C	mercury	
17	C	113047	Gibson Creek 48-54 109	Sediment	10/18/95	8 oz glass/4 C	TAL metals,TPH,BNA	
18	B	113048	H3 0-12	Sediment	10/18/95	8 oz glass/4 C	mercury	
15	A	113051	H3 30+	Sediment	10/18/95	4 oz glass/4 C	mercury	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analyses	[signature]	10/19/95	[signature]	10/20/95	1200						

0013100027

000130

629

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-115

REAC Edison NJ
Contact Huston Mark
908 321 4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name LCP Chemical Site
Location 65 Ross Road Brunswick, GA
Site Phone 912-264-9533

Page No.: 1 of 2
Cooler #:002375
Lab: Weston/REAC- Penta
Contact: John Syslo
715-349-7741

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
	A	1-SEDREF	Little Satilla	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	104-SED	Purvis Creek	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	105-SED	Purvis Creek	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	106-SED	Purvis Creek	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	107-SED	Purvis Creek	Sediment	10/18/95	4 oz glass/4 C	PCB	
	B	113035	Grid marsh	Sediment	10/18/95	4 oz glass/4 C	PCB	
	B	113036	Process south	Soil	10/18/95	4 oz glass/4 C	PCB	
	B	113037	Cell bldg	Soil	10/18/95	4 oz glass/4 C	PCB	
	A	113039	Turtle River US 0-6 108	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113040	Turtle River 24-30 108	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113042	Turtle River 48-54 108	Sediment	10/18/95	4 oz. sept/4 C	PCB	
	A	113043	Gibson Creek 0-6 109	Sediment	10/18/95	4 oz. sept/4 C	PCB	
	A	113044	Gibson Creek 18-24 109	Sediment	10/18/95	4 oz. sept/4 C	PCB	
	A	113047	Gibson Creek 48-54 109	Sediment	10/18/95	4 oz glass/4 C	PCB	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analyses	[signature]	10/19/95	[signature]	10/20/95	13:30						

EA580032

001131

CHAIN OF CUSTODY RECORD

COC # 0113-116

USEPA ERT

Page No.: 2 of 2

Project Name LCP Chemical Site
Location 65 Ross Road Brunswick, GA
Site Phone 912 264 9533

Cooler #:002375
Lab: Weston/REAC-Penta
Contact: John Syslo
715-349-7741

REAC Edison NJ
Contact Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
	A	113048	H3 0-12	Sediment	10/18/95	4 oz glass/4 C	PCB	
	B	113051	H3 30+	Sediment	10/18/95	8 oz glass/4 C	PCB	
	A	113073	J1 0-6	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113074	L1 0-6	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113076	L1 12-18	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113077	F2 0-6	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113079	F2 12-18	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113081	F2 24-30	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113093	H4 0-6	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113095	H4 12-18	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113097	H4 24-30	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113098	B1 0-6	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113100	B1 12-18	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113102	B1 24-30	Sediment	10/18/95	4 oz glass/4 C	PCB	

REFERENCE COC:

Special Instructions:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analyses	[signature]	10/19/95	[signature]	10/20/95	1200						

EAS00013

00132

USEPA EF

CHAIN OF CUSTODY RECORD

2379

COC # 0113-1

Page No.: 1 of 2

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road Brunswick, GA
Site Phone: 912 264-9533

Cooler #:
Lab: Integrated Analytic
Contact: Alan Belkin
201-361-4252

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
2379-01	C	113048	H3 0-12	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
2	C	113051	H3 30+	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
3	B	113073	J1 0-8	Sediment	10/18/95	8 oz glass/4 C	mercury	
4	B	113074	L1 0-8	Sediment	10/18/95	8 oz glass/4 C	mercury	
5	B	113076	L1 12-18	Sediment	10/18/95	8 oz glass/4 C	mercury	
6	B	113077	F2 0-8	Sediment	10/18/95	8 oz glass/4 C	mercury	
7	B	113079	F2 12-18	Sediment	10/18/95	8 oz glass/4 C	mercury	
8	B	113081	F2 24-30	Sediment	10/18/95	8 oz glass/4 C	mercury	
9	B	113082	E3 0-8	Sediment	10/18/95	8 oz glass/4 C	mercury	
10	B	113084	E3 12-18	Sediment	10/18/95	8 oz glass/4 C	mercury	
11	B	113086	E3 24-30	Sediment	10/18/95	8 oz glass/4 C	mercury	
12	B	113089	B2 0-8	Sediment	10/18/95	8 oz glass/4 C	mercury	
13	B	113091	B2 12-18	Sediment	10/18/95	8 oz glass/4 C	mercury	
14	B	113093	H4 0-8	Sediment	10/18/95	8 oz glass/4 C	mercury	
15	C	113093	H4 0-8	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
16	B	113095	H4 12-18	Sediment	10/18/95	8 oz glass/4 C	mercury	
17	B	113097	H4 24-30	Sediment	10/18/95	8 oz glass/4 C	mercury	
18	B	113098	B1 0-8	Sediment	10/18/95	8 oz glass/4 C	mercury	
19	B	113100	B1 12-18	Sediment	10/18/95	8 oz glass/4 C	mercury	
20	B	113102	B1 24-30	Sediment	10/18/95	8 oz glass/4 C	mercury	

E5100046

00123

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/analyses	Donna Getty	10/19/95	[signature]	10/20	[illegible]						

577

USEPA ER CHAIN OF CUSTODY RECORD 2379 118

COC # 0113-1... K

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO#: 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road Brunswick, GA
Site Phone: 912-264-8533

Page No.: 2 of 2
Cooler #:
Lab: Integrated Analytic
Contact: Alan Belkin
201-361-4252

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
21	C	113095	H4 12-18	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
22	C	113097	H4 24-30	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
23	C	113098	B1 0-6	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
24	C	113100	B1 12-18	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
25	C	113102	B1 24-30	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	

E510047

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all analyses	Denise Getty	10/19/95	[signature]	10/20	1200						

00124

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-119

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road Brunswick, GA
Site Phone: 912-264-9533

Page No.: 1 **of** 1
Cooler #:
Lab: Weston REAC Penta
Contact: John Syslo
715-349-7741

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
	A	113082	E3 0-6	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113084	E3 12-18	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113086	E3 24-30	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113089	B2 0-6	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113091	B2 12-18	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113104	H1 0-6	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113106	H1 12-18	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113108	H2 0-6	Sediment	10/18/95	4 oz glass/4 C	PCB	
	A	113110	H2 12-18	Sediment	10/18/95	4 oz glass/4 C	PCB	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/analyses	Anne Sitty	10/19/95	J Sysl	10/20/95	1030						

001153

EAS80034

USEPA ...

CHAIN OF CUSTODY RECORD

2380

12d

COC # 0113-12 K

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO#: 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name LCP Chemical Site
Location 65 Ross Road Brunswick, GA
Site Phone 912-264-9533

Page No.: 1 of 1
Cooler #:
Lab: Integrated Analytic
Contact: Alan Balkin
201-381-4252

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
01	B	111-SED	Drainage Channel	Sediment	10/19/95	8 oz glass/4 C	mercury	
2	B	112-SED	Purvis Creek	Sediment	10/19/95	8 oz glass/4 C	mercury	
3	B	113-SED	Main Tributary	Sediment	10/19/95	8 oz glass/4 C	mercury	
4	B	113104	H1 0-6	Sediment	10/18/95	8 oz glass/4 C	mercury	
5	C	113104	H1 0-6	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
6	B	113106	H1 12-18	Sediment	10/18/95	8 oz glass/4 C	mercury	
7	C	113106	H1 12-18	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
8	B	113108	H2 0-6	Sediment	10/18/95	8 oz glass/4 C	mercury	
9	C	113108	H2 0-6	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
10	B	113110	H2 12-18	Sediment	10/18/95	8 oz glass/4 C	mercury	
11	C	113110	H2 12-18	Sediment	10/18/95	8 oz glass/4 C	TAL/BNA	
12	B	115-SED	Main Tributary	Sediment	10/19/95	8 oz glass/4 C	mercury	
13	B	116-SED	Main Tributary	Sediment	10/19/95	8 oz glass/4 C	mercury	

E5100088

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analyses	[signature]	10/19/95	[signature]	10/20	1200						

536

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-124

REAC Edison NJ
Contact Huston Mark
908 321 4200
WO# 03347 040 001 0113 01
EPA Contract 68 C4 0022

Project Name LCP Chemical Site
Location 65 Ross Road Brunswick, GA
Site Phone 912 264 9533

Page No.: 1 of 2
Cooler #:
Lab Roy F. Weston Penta
Contact: John Syslo
715-349-7741

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
	A	111 SED	Drainage Channel	Sediment	10/19/95	4 oz glass/4 C	PCB	
	A	112 SED	Purvis Creek	Sediment	10/19/95	4 oz glass/4 C	PCB	
	A	113 SED	Main Tributary	Sediment	10/19/95	4 oz glass/4 C	PCB	
	A	113113	Purvis Creek 0 6 110	Sediment	10/19/95	4 oz glass/4 C	PCB	
	A	113115	Purvis Creek 12 18 110	Sediment	10/19/95	4 oz glass/4 C	PCB	
	A	113117	Purvis Creek 24 30 110	Sediment	10/19/95	4 oz glass/4 C	PCB	
	A	113119	Drainage Channel 0 6 114	Sediment	10/19/95	4 oz glass/4 C	PCB	
	A	113121	Drainage Channel 12 18 11	Sediment	10/19/95	4 oz glass/4 C	PCB	
	A	115-SED	Main Tributary	Sediment	10/19/95	4 oz glass/4 C	PCB	
	A	116 SED	Main Tributary	Sediment	10/19/95	4 oz glass/4 C	PCB	
	A	117-SED	Outfall Purvis Creek 117	Sediment	10/19/95	8 oz glass/4 C	PCB	
	A	118-SED	South Marsh 118	Sediment	10/19/95	8 oz glass/4 C	PCB	
	A	119-SED	South Marsh 119	Sediment	10/19/95	8 oz glass/4 C	PCB	
	A	120-SED	North Marsh 120	Sediment	10/19/95	8 oz glass/4 C	PCB	
	A	121-SED	North Marsh 121	Sediment	10/19/95	8 oz glass/4 C	PCB	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/analyses	Donna Getty	10/20/95	[signature]	10/23	13:30						

E4580035

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-126

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road, Brunswick, GA
Site Phone: 912-264-9533

Page No.: 2 **of** 2
Cooler #:
Lab: Roy F. Weston Penta
Contact: John Syslo
715-340-7741

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
	A	122 SED	Turtle River 122	Sediment	10/20/95	4 oz glass/4 C	PCB	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/analyses	[signature]	10/21/95	[signature]	10/23	12:30						

EAS80136

0018

USEPA E... CHAIN OF CUSTO... RECORD COC # 0113 / 127 GK

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name LCP Chemical Site
Location 65 Ross Road Brunswick, GA
Site Phone 912-264-9533

Page No.: 1 of 2
Cooler #:
Lab: Roy F. Weston
Contact: Tony Loeurdo
908-321-4200

102495

	LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
038	037	A	113123		Spot	10/19/95	Foil/bag/0 C	Archive	
039	038	A	113124		Spot	10/19/95	Foil/bag/0 C	Archive	
040	039	A	113125		Spot	10/19/95	Foil/bag/0 C	Archive	
041	040	A	113126		Spot	10/19/95	Foil/bag/0 C	Archive	
042	041	A	113127		Spot	10/19/95	Foil/bag/0 C	Archive	
043	042	A	113128		Spot	10/19/95	Foil/bag/0 C	Archive	
044	043	A	113129		Spot	10/19/95	Foil/bag/0 C	Archive	
045	044	A	113130		Brown Shrimp	10/19/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	
046	045	A	113131		Brown Shrimp	10/19/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	
047	046	A	113132		Brown Shrimp	10/19/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	
048	047	A	113133		Brown Shrimp	10/19/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	
049	048	A	113134		Brown Shrimp	10/19/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	
050	049	A	113135		Brown Shrimp	10/19/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	
051	050	A	113136		Brown Shrimp	10/19/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	
052	051	A	113153		BC Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
053	052	A	113154 *		BC Crab	10/18/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
054	053	A	113155		BC Crab	10/18/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
055	054	A	113156 *		BC Crab	10/18/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
056	055	A	113157 *		BC Crab	10/18/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	

Special Instructions: * SAMPLES WERE HOMOGENIZED WITH CO2BLK 102395 (Y/N)

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/analyses	H. Kyle	10/20/95	Y. Kwush	10.21.95	12:00	All/analyses	Y. Kwush	10/24/95	B. Lew	10/24/95	08:20
All/Hg	B. Lew	10/24/95	C. Egw	10/24/95	9:30						

E4650019

0013

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 011 28

128
6K

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road Brunswick, GA
Site Phone: 912-264-8533

Page No.: 2 of 2
Cooler #:
Lab: Roy F. Weston
Contact: Tony Losurdo
908-321-4200

102495

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
Recc 036	A	113158		BC Crab	10/18/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
037	A	113159		BC Crab	10/18/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analyses	W. Hale	10/20/95	Y. Nemeth	10/21/95	12:00	All analyses	Y. Nemeth	10/21/95	B. Lewis	10/23/95	0820
All / Hg	B. Lewis	10/24/95	C. Egan	10/24/95	9:30						

E4650018

00140

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-12, ck

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name LCP Chemical Site
Location 85 Ross Road Brunswick, GA
Site Phone 912 264-9533

Page No.: 1 of 2
Cooler #:2411
Lab: Integrated Analytic
Contact: Alan Belkin
201-361-4252

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
2396-01	B	113113	Purvis Creek 0-6 110	Sediment	10/19/95	8 oz glass/4 C	mercury	
2	C	113113	Purvis Creek 0-6 110	Sediment	10/19/95	8 oz glass/4 C	TAL/BNA	
3	B	113115	Purvis Creek 12-18 110	Sediment	10/19/95	8 oz glass/4 C	mercury	
4	C	113115	Purvis Creek 12-18 110	Sediment	10/19/95	8 oz glass/4 C	TAL/BNA	
5	B	113117	Purvis Creek 24-30 110	Sediment	10/19/95	8 oz glass/4 C	mercury	
6	C	113117	Purvis Creek 24-30 110	Sediment	10/19/95	8 oz glass/4 C	TAL/BNA	
7	B	113119	Drainage Channel 0-6 114	Sediment	10/19/95	8 oz glass/4 C	mercury	
8	C	113119	Drainage Channel 0-6 114	Sediment	10/19/95	8 oz glass/4 C	TAL/BNA	
9	B	113121	Drainage Channel 12-18 11	Sediment	10/19/95	8 oz glass/4 C	mercury	
10	C	113121	Drainage Channel 12-18 11	Sediment	10/19/95	8 oz glass/4 C	TAL/BNA	
11	B	117-SED	Outfall Purvis Creek 117	Sediment	10/19/95	8 oz glass/4 C	mercury	
12	B	118-SED	South Marsh 118	Sediment	10/19/95	8 oz glass/4 C	mercury	

Special Instructions:

REFERENCE COC: 2396

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/analysis	[illegible signature]	10/20/95	[illegible signature]	10/20/95	10:20 AM						

E3100070

554

130

USEPA E[illegible] CHAIN OF CUSTO[illegible] [illegible]ECORD COC # 0113-13 511

REAC, Edison, NJ
Contact: Huston, Mark
908-321-4200
WO#: 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road Brunswick, GA
Site Phone: 912-264-9533

Page No.: 2 of 2
Cooler #:2411
Lab: Integrated Analytic
Contact: Alan Baikin
201-361-4252

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
2396-13	8	119-SED	South Marsh 119	Sediment	10/19/95	8 oz glass/4 C	mercury	
14	8	120-SED	North Marsh 120	Sediment	10/19/95	8 oz glass/4 C	mercury	
15	8	121-SED	North Marsh 121	Sediment	10/19/95	8 oz glass/4 C	mercury	
16	8	122-SED	Turtle River 122	Sediment	10/20/95	8 oz glass/4 C	mercury	

E5100071

Special Instructions:

REFERENCE COC: 2396

Name/Reason	Relinquished By	Date	Received By	Date	Time	Name/Reason	Relinquished By	Date	Received By	Date	Time
all analyses	[illegible]	10/20/95	[illegible]	10/23/95	10:20 Am						

001-12

555

USEPA [illegible] IT — CHAIN OF CUSTODY RECORD — COC # 011[illegible]31

131
GK

REAC Edison, NJ
Contact: Huston, Mark
908-321-4200
WO# 03347-040-001-0113-01
EPA Contract 68-C4-0022

Project Name: LCP Chemical Site
Location: 65 Ross Road, Brunswick, GA
Site Phone: 912-264-8533

Page No.: 1 of 1
Cooler #:
Lab: Roy F. Weston
Contact: Tony Losurdo
908-321-4200

1024 95

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
020	A	113137		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
021	A	113138		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
022	A	113139		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
023	A	113140		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
024	A	113141	19-30	Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
025	A	113142		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
026	A	113143		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
027	A	113144		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
028	A	113145		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
029	A	113146	17-18	Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
030	A	113147		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
031	A	113148		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
032	A	113149		Fid Crab	10/19/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
033	A	113150	REFERENCE	Fid Crab	10/18/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
034	A	113151	LITTLE	Fid Crab	10/18/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	
035	A	113152	SATILLA	Fid Crab	10/18/95	4 oz glass/0 C	Hg,PCB, %moisture,%lipids	

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all analyses	Mark Huston	10/20/95	G. [illegible]	10.21.95	12:00	All/analyses	G. [illegible]	10/24/95	B Lewa	10/24/95	0820
All/Hg	B Lewa	10/24/95	C Egr	10/26/95	9:30						

E4650017

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0113-132

REAC Edison NJ
Contact Huston Mark
908 321 4200
WO# 03347 040 001 0113 01
EPA Contract 68 C4 0022

Project Name LCP Chemical Site
Location 65 Ross Road Brunswick, GA
Site Phone 912 264 9533

Page No: 1 of 1
Cooler #:
Lab: Roy F. Weston
Contact: Huston, Mark
908-321-4200

0028

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	Comments
	A	113200	North 8	WHOLE BODY	10/20/95	Foil/bag/4 C	Hg,PCB, %moisture,%lipids	
	B	~~113200~~	~~North 8~~	~~Liver, Kidney, Testes~~	~~10/20/95~~	~~8 oz glass/Formalin~~	~~Histopathology~~	5 G.
	A	113201	North 14	WHOLE BODY	10/20/95	Foil/bag/0 C	Hg,PCB, %moisture,%lipids	
	B	113201	North 14	Liver, Kidney, Testes	10/20/95	8 oz glass/Formalin	Histopathology	5 G.

Special Instructions:

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all analyses	Mark Huston	10/21/95							R. P[illegible]	10/25	09:30

00114

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
908-321-4200 • Fax 908-494-4021

Integrated Analytical Labs
273 Franklin Road
Randolph, NJ. 07869

Attn: Alan Belkin

October 19, 1995

Project # 3347-040-001-0113, LCP Chemical

As per Weston REAC Purchase Order number 08-52897, please analyze samples according to the following parameters:

Analysis/Method	Matrix	# of samples
BNA/SW-846-8270B. See attached compound list.	Sediment	36
Hg/SW-846-7471A.	Sediment	100
TAL Metals/Series 6010 or 7000.	Sediment	36
TAL Metals/Series 6010 or 7000 **	Sediment	2
BNA/SW-846-8270 **	Sediment	2
TPH EPA 418.1 **	Sediment	2
Data package including diskette deliverables* as per attached Deliverables Requirements		

** Preliminary results for these samples are due 7 business days after sample receipt.

Samples are expected to arrive at your laboratory on between October 16-21, 1995. All applicable QA/QC (MS/MSD) analysis as per method, will be performed on our sample matrix. Except as listed above, preliminary results tables including MS/MSD's plus a signed copy of our Chain of Custody are due at REAC 10 business days after receipt of last sample, with the complete data package due 21 business days after receipt of last sample. The complete data package must include all items on the deliverables checklist.

These samples may be dioxin contaminated.

ALL ORGANIC EXTRACTIONS ON SOLIDS, IE: BNA, PEST/PCB MUST BE BY SOXHLET EXTRACTION.

Please submit all reports and technical questions concerning this project to **John Johnson at (908) 321-4248 or fax to (908) 494-4020**. Any contractual question, please call Cindy Ritchey at (908) 321-4296. Thank you

Sincerely,

Misty Barkley

Misty Barkley
Data Validation and Report Writing Group Leader
Roy F. Weston, Inc. / REAC Project

GA:jj Attachments

cc	R. Singhvi	V. Kansal	C. Ritchey
	M.Sprenger/J.Camacho	Subcontracting File	M. Huston/R. Tobia
	0113\non\mem\9510\sub\0113Con6	B. Lewan	M. Barkley

WESTON
MANAGERS DESIGNERS CONSULTANTS
Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
908-321-4200 • Fax 908-494-4021

Alta Analytical Laboratory, Inc.
5070 Robert J. Matthews Parkway, Suite 2
El Dorado Hills, CA 95630

Attn: Bob Mitzl

October 20, 1995

Project # 3347-040-001-0113, LCP Chemical

As per Weston REAC Purchase Order number 08-53025, please analyze samples according to the following parameters:

Analysis/Method	Matrix	# of samples
Dioxin/SW-846-8290	Soil/ Sediment	2 2
Data package including diskette deliverables* as per attached Deliverables Requirements		

Samples are expected to arrive at your laboratory on October 20,1995. All applicable QA/QC (MS/MSD) analysis as per method, will be performed on each of our sample matrix. Final report is due at REAC 10 business days after receipt of sample. The complete data package must include all items on the deliverables checklist:

ALL ORGANIC EXTRACTIONS ON SOLIDS IE: BNA, PEST/PCB MUST BE BY SOXHLET EXTRACTION

*Diskette deliverables are required in Lotus 1-2-3 spreadsheet. Please submit a 3.5" diskette with the data package

Please submit all reports and technical questions concerning this project to **John Johnson at (908) 321-4248** or fax to (908) 494-4020. Any contractual question, please call Cindy Ritchey at (908) 321-4296. Thank you

Sincerely,

Misty Barkley

Misty Barkley
Data Validation and Report Writing Group Leader
Roy F. Weston, Inc./REAC Project

GA:j Attachments

cc R. Singhvi
J. Camacho
0113\non\mem\9510\sub\0113Con8
V. Kansal
Subcontracting File
B. Lewan
C. Ritchey
R. Tobia
M. Barkley

Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
908-321-4200 • Fax 908-494-4021

WESTON
MANAGERS DESIGNERS-CONSULTANTS

Southwest Research Institute
PO Box 28510, 6220 Culebra
San Antonio, TX 78228-0510

Attn: Jo Ann Boyd

October 19, 1995

Project # 3347-040-001-0113, LCP Chemical

As per Weston REAC Purchase Order number 08-52936, please analyze samples according to the following parameters:

Analysis/Method	Matrix	# of samples
Tissue Homogenization/See attached method	Whole rat	21
PCB/SW-846-8080A	Homogenized rat tissue	21
Hg/SW-846-7471	Homogenized rat tissue	21
% Lipids/Gravimetric	Homogenized rat tissue	21
% Moisture/Gravimetric	Homogenized rat tissue	21
Data package as per attached Deliverables Requirements		

Samples are expected to arrive at your laboratory on October 20, 1995. All applicable QA/QC (MS/MSD) analysis as per method, will be performed on our sample matrix. Preliminary results tables including MS/MSD's plus a signed copy of our Chain of Custody is due at REAC 10 business days after receipt of sample, with the complete data package due 21 business days after receipt of last sample. The complete data package must include all items on the deliverables checklist.

ALL ORGANIC EXTRACTIONS ON SOLIDS IE: BNA, PEST/PCB MUST BE BY SOXHLET EXTRACTION

Homogenization of whole rats should be done in biohazard laboratory because of possible Hanta virus contamination. Tissues are to be homogenized immediately upon receipt and extraction of PCB must be done within 7 days of sample receipt.

A separate CO2 blank should be prepared for mercury by taking 500g of dry ice, blending in mixer, transfer to extraction vessel used for mercury analysis and let the dry ice sublime.

Please submit all reports and technical questions concerning this project to **John Johnson at (908) 321-4248** or fax to (908) 494-4020 Any contractual question, please call Cindy Ritchey at (908) 321-4296. Thank you

Sincerely,

Misty Barkley
Data Validation and Report Writing Group Leader
Roy F. Weston Inc./REAC Project

GA / Attachments

cc	R. Singhvi	V. Kansal	C. Ritchey
	M. Sprenger	Subcontracting File	M. Huston
	0113\non\mem\9510\sub\0113Con7	B. Lewan	M. Barkley

FAX MESSAGE

TO:	Brenda	FROM:	John Johnson
CO:	Integrated labs	CO:	WESTON/REAC
DEPT:	Analytical	PHONE #:	(908) 321-4248
FAX #	(201) 989-5288	FAX #	(908) 494-4020
DATE:	November 06, 1995	ADDITIONAL PAGES	01

SUBJECT: LCP Chemical

Please analyze the following samples for BNA, TAL Metals and THP except 113-113C and 113-119C which should be analyzed for TPH only. These samples were sent to you between 10/17-19/1995. We understand the BNA are out of hold time and the TPH sample are close to being out of hold time but we would still like the analysis done. Please invoice these samples against our purchase order 08-52897.

Sample Number	Location	Chain of Custody
100-SED	Purvis Creek	0113-002 (Pg. 2)
F2 (0-6)	South Marsh	0113-117
F2 (24-30)	South Marsh	0113-117
111-SED	Drainage Ditch	0113-120
112-SED	Purvis Creek	0113-120
113 SED	Main Tributary	0113-120
115 SED	Main Tributary	0113-120
116 SED	Main Tributary	0113-120
113-113C (0-6 110) TPH only	Purvis Creek	0113-129
113-119C (0-6 114) TPH only	Drainage Ditch	0113-129
117-SED	Outfall	0113-129
118 SED	South Marsh	0113-129
119-SED	South Marsh	0113-130 (Pg. 2)
120-SED	North Marsh	0113-130 (Pg. 2)
121 SED	North Marsh	0113-130 (Pg. 2)
106 SED	Purvis Creek	0113-113

cc: C. Davison
M. Huston
M. Barkley

113FAX6

LCP Chemical, Brunswick, GA - Base, Neutral, and Acid Extractable (BNA), Target Analyte List Metals, and Total Petroleum Hydrocarbons (TPH).

Sample Number	Location	Chain of Custody
100-SED	Purvis Creek	0113-002 (Pg. 2)
F2 (0-6)	South Marsh	0113-117
F2 (24-30)	South Marsh	0113-117
111-SED	Drainage Ditch	0113-120
112-SED	Purvis Creek	0113-120
113-SED	Main Tributary	0113-120
115-SED	Main Tributary	0113-120
116-SED	Main Tributary	0113-120
113-113C (0-6:110) **TPH only**	Purvis Creek	0113-129
113-119C (0-6:114) **TPH only**	Drainage Ditch	0113-129
117-SED	Outfall	0113-129
118-SED	South Marsh	0113-129
119-SED	South Marsh	0113-130 (Pg. 2)
120-SED	North Marsh	0113-130 (Pg. 2)
121-SED	North Marsh	0113-130 (Pg. 2)
106-SED	Purvis Creek	0113-113

All samples should be analyzed for BNAs, TAL metals, and TPHs, except for samples 113-113C and 113-119C. These 2 samples should only be analyzed for TPH

3 12 101

Appendix H
Benthological Report
LCP Site
Brunswick, GA
April 1997

RECEIVED
JAN - 4 1996
WESTON/REAC

23 Bree Drive
Hamilton, NJ 08690
2 January 1996

Mark Huston
Roy F. Weston Inc.
GSA Raritan Depot, Woodbridge
BLDG 209, Bay F
Edison, NJ 08837-3679

Dear Mark:

Enclosed please find the tabulated infauna densities of samples collected from the LCP Chemicals site in Brunswick, Georgia. As requested, I have provided these data in electronic format (as well as hard copy) using Microsoft's Excel for the MacIntosh. Please note that Replicate 4 from the Reference Location is not included in the tabulations, as I could not find the sample. I have revised the Purchase Order accordingly (please see attached copy) and sent it to Roy F. Weston Accounts Payable in Westchester, PA. If there are any questions please call. Thank you.

Sincerely,

John Sacco

Organism	Feeding Mode	Reference Mean	Reference Standard Deviation	OF Ditch Mean	OF Ditch Standard Deviation	Sample 10-11 Mean	Sample 10-11 Standard Deviation	Sample 17-18 Mean	Sample 17-18 Standard Deviation	Sample 19-20 Mean	Sample 19-20 Standard Deviation
Oligochaete A	Sub	5777	3523	6048	3126	10292	12772	9125	4671	2653	3978
Oligochaete B	Sub	4834	4314	2122	4063	3926	5247	8700	5359	5199	10059
Oligochaete C	Sub	0	0	3608	8373	0	0	0	0	0	0
Oligo. Other	Sub	118	354	424	895	0	0	531	1031	955	2668
Oligo. Juvenile	Sub	10139	6302	8913	13140	23131	14828	3077	3725	2240	2016
Manayunkia aestuarina	Surf	14029	11955	6578	8617	19947	18860	141436	77959	42547	37271
Streblospio benedicti	Surf	0	0	17931	20547	4562	4003	849	837	424	548
Capitella sp	Sub	118	354	212	447	0	0	212	671	1273	2335
Captellid A	Sub	236	468	6791	8565	4987	9929	955	1454	531	902
Capitellidae Other	Sub	707	1186	637	1674	2016	2572	6154	6183	424	1342
Nereidae sp	Surf	0	0	637	742	424	1025	106	336	318	513
Syllidae	Carn	0	0	0	0	106	336	0	0	0	0
Orbiniidae	Sub	0	0	106	336	0	0	0	0	0	0
Nematoda	???	5659	5884	3501	4034	73424	46146	2759	3848	2016	2317
Uca sp	Surf	0	0	106	336	0	0	743	716	106	336
Sesarma sp	Surf	0	0	0	0	0	0	0	0	212	447
Gammaridae	Surf	354	750	106	336	212	447	318	513	0	0
Cyathura polita	Surf	589	559	743	716	0	0	318	716	0	0
Leptochelia sp	Surf	0	0	0	0	106	336	0	0	0	0
Harpactocoid copapod	???	118	354	0	0	106	336	0	0	0	0
Crab larva	Surf	118	354	0	0	0	0	106	336	0	0
Collembola	Surf	1297	2107	0	0	106	336	106	336	0	0
Dolichopodidae	Carn	236	468	0	0	318	513	212	447	106	336
Tabanidae	Carn	118	354	0	0	0	0	0	0	0	0
Ceratopogonidae	Surf	118	354	0	0	0	0	0	0	0	0
Diptera Other	???	589	771	0	0	106	336	106	336	0	0
Gastropoda	Surf	707	1061	106	336	0	0	0	0	0	0
Rhynchocoela	Carn	0	0	106	336	106	336	0	0	0	0
Acarina	???	118	354	0	0	212	447	0	0	106	336

	A	B	C	D	E	F
1	Organism		Feeding Mode		Reference 1	Reference 2
2						
3	Oligochaete A		Sub		5	9
4	Oligochaete B		Sub		5	5
5	Oligochaete C		Sub		0	0
6	Oligo. Other		Sub		0	0
7	Oligo. Juvenile		Sub		20	7
8	Total Oligochaeta		Sub			
9						
10	Manayunkia aestuarina		Surf		4	19
11	Streblospio benedicti		Surf		0	0
12	Capitella spp		Sub		0	0
13	Captellid A		Sub		0	0
14	Capitellidae Other		Sub		0	2
15	Nereidae sp		Surf		0	0
16	Syllidae		Carn		0	0
17	Orbiniidae		Sub		0	0
18						
19	Nematoda		???		14	2
20						
21	Uca sp		Surf		0	0
22	Sesarma sp		Surf		0	0
23	Gammaridae		Surf		1	0
24	Cyathura polita		Surf		0	1
25	Leptochelia sp		Surf		0	0
26	Harpactocoid copapod		???		0	0
27	Crab larva		Surf		0	1
28						
29	Collembola		Surf		6	1
30	Dolichopodidae		Carn		0	0
31	Tabanidae		Carn		0	0
32	Ceratopogonidae		Surf		0	0
33	Diptera Other		???		1	0
34	Homoptera				0	0
35						
36	Gastropoda		Surf		0	1
37	Rhynchocoela		Carn		0	0
38	Acarina		???		1	0
39						
40						
41						
42						

	G	H	I	J	K	L
1	Reference 3	Reference 5	Reference 6	Reference 7	Reference 8	Reference 9
2						
3	1	6	0	5	9	5
4	5	1	1	8	3	0
5	0	0	0	0	0	0
6	0	0	0	0	1	0
7	1	14	9	10	6	4
8						
9						
10	21	11	36	7	17	0
11	0	0	0	0	0	0
12	1	0	0	0	0	0
13	0	0	0	0	1	1
14	0	1	0	0	0	0
15	0	0	0	0	0	0
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18						
19	3	12	10	0	0	0
20						
21	0	0	0	0	0	0
22	0	0	0	0	0	0
23	2	0	0	0	0	0
24	1	1	0	1	0	0
25	0	0	0	0	0	0
26	1	0	0	0	0	0
27	0	0	0	0	0	0
28						
29	0	0	0	2	2	0
30	0	0	1	0	0	0
31	0	0	0	0	1	0
32	0	0	0	0	0	1
33	2	0	0	1	1	0
34	0	0	0	0	0	0
35						
36	1	0	1	0	3	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39						
40						
41						
42						

	M	N	O	P	Q	R
1	Reference 10		OF Ditch 1	OF Ditch 2	OF Ditch 3	OF Ditch 4
2						
3	9		5	10	5	5
4	13		0	1	0	11
5	0		10	24	0	0
6	0		0	2	0	0
7	15		23	38	1	2
8						
9						
10	4		17	8	0	2
11	0		0	0	4	26
12	0		0	0	0	1
13	0		0	5	14	0
14	3		0	0	0	0
15	0		2	1	0	0
16	0		0	0	0	0
17	0		0	0	0	0
18						
19	7		11	7	4	0
20						
21	0		1	0	0	0
22	0		0	0	0	0
23	0		0	0	0	0
24	1		1	2	1	0
25	0		0	0	0	0
26	0		0	0	0	0
27	0		0	0	0	0
28						
29	0		0	0	0	0
30	1		0	0	0	0
31	0		0	0	0	0
32	0		0	0	0	0
33	0		0	0	0	0
34	0		0	0	0	0
35						
36	0		0	0	1	0
37	0		0	0	0	0
38	0		0	0	0	0
39						
40						
41						
42						

	S	T	U	V	W	X
1	OF Ditch 5	OF Ditch 6	OF Ditch 7	OF Ditch 8	OF Ditch 9	OF Ditch 10
2						
3	9	1	5	6	2	9
4	0	0	7	1	0	0
5	0	0	0	0	0	0
6	0	2	0	0	0	0
7	0	8	3	3	1	5
8						
9						
10	0	4	0	24	2	5
11	21	20	3	64	8	23
12	0	0	0	1	0	0
13	0	14	0	1	7	23
14	0	1	0	5	0	0
15	1	0	0	1	0	1
16	0	0	0	0	0	0
17	0	0	0	1	0	0
18						
19	0	6	0	1	4	0
20						
21	0	0	0	0	0	0
22	0	0	0	0	0	0
23	0	0	0	0	1	0
24	0	1	0	0	1	1
25	0	0	0	0	0	0
26	0	0	0	0	0	0
27	0	0	0	0	0	0
28						
29	0	0	0	0	0	0
30	0	0	0	0	0	0
31	0	0	0	0	0	0
32	0	0	0	0	0	0
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35						
36	0	0	0	0	0	0
37	0	0	1	0	0	0
38	0	0	0	0	0	0
39						
40						
41						
42						

	Y	Z	AA	AB	AC	AD
1		10-11 1	10-11 2	10-11 3	10-11 4	10-11 5
2						
3		43	2	11	8	6
4		0	9	1	11	12
5		0	0	0	0	0
6		0	0	0	0	0
7		44	35	35	21	23
8						
9						
10		14	23	12	63	12
11		9	8	2	1	3
12		0	0	0	0	0
13		30	0	0	0	0
14		3	2	0	0	0
15		0	0	0	0	1
16		0	0	1	0	0
17		0	0	0	0	0
18						
19		103	6	124	128	29
20						
21		0	0	0	0	0
22		0	0	0	0	0
23		0	0	0	0	0
24		0	0	0	0	0
25		0	0	0	0	0
26		0	0	1	0	0
27		0	0	0	0	0
28						
29		0	0	0	0	0
30		0	0	1	1	0
31		0	0	0	0	0
32		0	0	0	0	0
33		0	0	1	0	0
34		0	0	0	0	0
35						
36		0	0	0	0	0
37		1	0	0	0	0
38		1	1	0	0	0
39						
40						
41						
42						

	AE	AF	AG	AH	AI	AJ
1	10-11 6	10-11 7	10-11 8	10-11 9	10-11 10	
2						
3	4	7	9	3	4	
4	3	0	0	0	1	
5	0	0	0	0	0	
6	0	0	0	0	0	
7	27	9	18	4	2	
8						
9						
10	21	1	27	0	15	
11	3	8	9	0	0	
12	0	0	0	0	0	
13	0	8	3	0	6	
14	1	8	1	3	1	
15	0	0	3	0	0	
16	0	0	0	0	0	
17	0	0	0	0	0	
18						
19	98	85	43	31	45	
20						
21	0	0	0	0	0	
22	0	0	0	0	0	
23	1	0	0	0	1	
24	0	0	0	0	0	
25	0	0	0	0	1	
26	0	0	0	0	0	
27	0	0	0	0	0	
28						
29	0	0	0	1	0	
30	1	0	0	0	0	
31	0	0	0	0	0	
32	0	0	0	0	0	
33	0	0	0	0	0	
34	0	0	0	0	0	
35						
36	0	0	0	0	0	
37	0	0	0	0	0	
38	0	0	0	0	0	
39						
40						
41						
42						

	AK	AL	AM	AN	AO	AP
1	17-18 (1)	17-18 (2)	17-18 (3)	17-18 (4)	17-18 (5)	17-18 (6)
2						
3	18	4	10	4	12	10
4	14	7	6	0	3	15
5	0	0	0	0	0	0
6	1	0	1	3	0	0
7	1	2	1	1	3	11
8						
9						
10	198	80	126	34	87	250
11	2	0	0	0	1	0
12	0	0	0	2	0	0
13	4	0	0	0	1	0
14	11	7	19	0	7	6
15	1	0	0	0	0	0
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18						
19	1	4	0	0	1	8
20						
21	2	1	1	0	0	1
22	0	0	0	0	0	0
23	0	1	0	0	1	1
24	0	0	1	0	0	0
25	0	0	0	0	0	0
26	0	0	0	0	0	0
27	1	0	0	0	0	0
28						
29	0	0	0	0	0	0
30	0	1	0	0	0	0
31	0	0	0	0	0	0
32	0	0	0	0	0	0
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35						
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39						
40						
41						
42						

	AQ	AR	AS	AT	AU	AV
1	17-18 (7)	17-18 (8)	17-18 (9)	17-18 (10)		19-20 (1)
2						
3	10	7	4	7		11
4	9	11	4	13		29
5	0	0	0	0		0
6	0	0	0	0		0
7	7	0	0	3		4
8						
9						
10	188	212	99	59		76
11	2	1	1	1		1
12	0	0	0	0		2
13	2	2	0	0		0
14	4	3	1	0		0
15	0	0	0	0		1
16	0	0	0	0		0
17	0	0	0	0		0
18						
19	10	0	2	0		3
20						
21	1	0	1	0		0
22	0	0	0	0		0
23	0	0	0	0		0
24	2	0	0	0		0
25	0	0	0	0		0
26	0	0	0	0		0
27	0	0	0	0		0
28						
29	0	1	0	0		0
30	0	1	0	0		0
31	0	0	0	0		0
32	0	0	0	0		0
33	1	0	0	0		0
34	0	0	0	0		0
35						
36	0	0	0	0		0
37	0	0	0	0		0
38	0	0	0	0		0
39						
40						
41						
42						

	AW	AX	AY	AZ	BA	BB
1	19-20 (2)	19-20 (3)	19-20 (4)	19-20 (5)	19-20 (6)	19-20 (7)
2						
3	0	0	4	4	0	6
4	0	0	8	0	0	12
5	0	0	0	0	0	0
6	0	0	0	0	8	0
7	3	0	3	3		0
8						
9						
10	34	13	55	11	14	120
11	1	0	1	0	0	1
12	0	0	0	7	0	0
13	2	0	0	2	1	0
14	0	0	4	0	0	0
15	1	0	0	0	0	1
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18						
19	0	0	5	0	5	2
20						
21	1	0	0	0	0	0
22	0	1	1	0	0	0
23	0	0	0	0	0	0
24	0	0	0	0	0	0
25	0	0	0	0	0	0
26	0	0	0	0	0	0
27	0	0	0	0	0	0
28						
29	0	0	0	0	0	0
30	C	0	0	0	0	0
31	0	0	0	0	0	0
32	0	0	0	0	0	0
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35						
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39						
40						
41						
42						

	BC	BD	BE
1	19-20 (8)	19-20 (9)	19-20 (10)
2			
3	0	0	0
4	0	0	0
5	0	0	0
6	0	1	0
7	5	0	1
8			
9			
10	39	25	14
11	0	0	0
12	1	2	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18			
19	4	0	0
20			
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28			
29	0	0	0
30	1	0	0
31	0	0	0
32	0	0	0
33	0	0	0
34	0	0	0
35			
36	0	0	0
37	0	0	0
38	0	1	0
39			
40			
41			
42			

		Reference		OF Ditch		Sample 10-11		Sample 17-18		Sample 19-20	
Organism	Feeding Mode	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Oligochaete A	Sub	5777	3523	6048	3126	10292	12772	9125	4671	2653	3978
Oligochaete B	Sub	4834	4314	2122	4063	3926	5247	8700	5359	5199	10059
Oligochaete C	Sub	0	0	3608	8373	0	0	0	0	0	0
Oligo. Other	Sub	118	354	424	895	0	0	531	1031	955	2668
Oligo. Juvenile	Sub	10139	6302	8913	13140	23131	14828	3077	3725	2240	2016
Manayunkia aestuarina	Surf	14029	11955	6578	8617	19947	18860	141436	77959	42547	37271
Streblospio benedicti	Surf	0	0	17931	20547	4562	4003	849	837	424	548
Capitella sp	Sub	118	354	212	447	0	0	212	671	1273	2335
Capitellid A	Sub	236	468	6791	8565	4987	9929	955	1454	531	902
Capitellidae Other	Sub	707	1186	637	1674	2016	2572	6154	6183	424	1342
Nereidae sp	Surf	0	0	637	742	424	1025	106	336	318	513
Syllidae	Carn	0	0	0	0	106	336	0	0	0	0
Orbiniidae	Sub	0	0	106	336	0	0	0	0	0	0
Nematoda	???	5659	5884	3501	4034	73424	46146	2759	3848	2016	2317
Uca sp	Surf	0	0	106	336	0	0	743	716	106	336
Sesarma sp	Surf	0	0	0	0	0	0	0	0	212	447
Gammaridae	Surf	354	750	106	336	212	447	318	513	0	0
Cyathura polita	Surf	589	559	743	716	0	0	318	716	0	0
Leptochelia sp	Surf	0	0	0	0	106	336	0	0	0	0
Harpactocoid copapod	???	118	354	0	0	106	336	0	0	0	0
Crab larva	Surf	118	354	0	0	0	0	106	336	0	0
Collembola	Surf	1297	2107	0	0	106	336	106	336	0	0
Dolichopodidae	Carn	236	468	0	0	318	513	212	447	106	336
Tabanidae	Carn	118	354	0	0	0	0	0	0	0	0
Ceratopogonidae	Surf	118	354	0	0	0	0	0	0	0	0
Diptera Other	???	589	771	0	0	106	336	106	336	0	0
Gastropoda	Surf	707	1061	106	336	0	0	0	0	0	0
Rhynchocoela	Carn	0	0	106	336	106	336	0	0	0	0
Acarina	???	118	354	0	0	212	447	0	0	106	336

		Reference		OF Ditch		Sample 10-11		Sample 17-18		Sam [illegible] -20	
Organism	Feeding Mode	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Oligochaete A	Sub	5776.74	3523.49	6047.89	3125.60	10292.03	12772.13	9124.89	4670.69	2652.58	3977.89
Oligochaete B	Sub	4833.60	4313.57	2122.07	4063.45	3925.83	5247.08	8700.48	5359.13	5199.07	10059.01
Oligochaete C	Sub	0.00	0.00	3607.52	8372.54	0.00	0.00	0.00	0.00	0.00	0.00
Oligo. Other	Sub	117.89	353.68	424.41	894.74	0.00	0.00	530.52	1031.14	954.93	2667.87
Oligo. Juvenile	Sub	10138.77	6302.02	8912.68	13140.46	23130.54	14827.50	3077.00	3724.55	2239.96	2016.27
Manayunkia aestuarina	Surf	14029.23	11954.63	6578.41	8616.98	19947.44	18860.02	141435.81	77958.60	42547.46	37270.51
Streblospio benedicti	Surf	0.00	0.00	17931.47	20546.53	4562.45	4002.97	848.83	836.95	424.41	547.92
Capitella spp	Sub	117.89	353.68	212.21	447.37	0.00	0.00	212.21	671.06	1273.24	2335.35
Captellid A	Sub	235.79	467.87	6790.62	8564.56	4986.86	9928.84	954.93	1453.96	530.52	901.71
Capitellidae Other	Sub	707.36	1186.27	636.62	1673.91	2015.96	2572.38	6154.00	6182.79	424.41	1342.11
Nereidae sp	Surf	0.00	0.00	636.62	741.88	424.41	1025.06	106.10	335.53	318.31	512.53
Syllidae	Carn	0.00	0.00	0.00	0.00	106.10	335.53	0.00	0.00	0.00	0.00
Orbiniidae	Sub	0.00	0.00	106.10	335.53	0.00	0.00	0.00	0.00	0.00	0.00
Nematoda	???	5658.85	5883.72	3501.41	4034.10	73423.54	46145.96	2758.69	3848.43	2015.96	2316.52
Uca sp	Surf	0.00	0.00	106.10	335.53	0.00	0.00	742.72	716.14	106.10	335.53
Sesarma sp	Surf	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	212.21	447.37
Gammaridae	Surf	353.68	750.26	106.10	335.53	212.21	447.37	318.31	512.53	0.00	0.00
Cyathura polita	Surf	589.46	559.21	742.72	716.14	0.00	0.00	318.31	716.14	0.00	0.00
Leptochelia sp	Surf	0.00	0.00	0.00	0.00	106.10	335.53	0.00	0.00	0.00	0.00
Harpactocoid copepod	???	117.89	353.68	0.00	0.00	106.10	335.53	0.00	0.00	0.00	0.00
Crab larva	Surf	117.89	353.68	0.00	0.00	0.00	0.00	106.10	335.53	0.00	0.00
Collembola	Surf	1296.82	2107.28	0.00	0.00	106.10	335.53	106.10	335.53	0.00	0.00
Dolichopodidae	Carn	235.79	467.87	0.00	0.00	318.31	512.53	212.21	447.37	106.10	335.53
Tabanidae	Carn	117.89	353.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ceratopogonidae	Surf	117.89	353.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diptera Other	???	589.46	770.82	0.00	0.00	106.10	335.53	106.10	335.53	0.00	0.00
Gastropoda	Surf	707.36	1061.03	106.10	335.53	0.00	0.00	0.00	0.00	0.00	0.00
Rhynchocoela	Carn	0.00	0.00	106.10	335.53	106.10	335.53	0.00	0.00	0.00	0.00
Acarina	???	117.89	353.68	0.00	0.00	212.21	447.37	0.00	0.00	106.10	335.53

Appendix I
Sediment Toxicity Test Report
LCP Site
Brunswick, GA
April 1997

AQUA SURVEY, INC.

499 Point Breeze Road • Flemington, New Jersey 08822 • Telephone (908) 788-8700 FAX (908) 788-9165

DRAFT

DRAFT REPORT

TOXICITY EVALUATION OF SEDIMENTS
FROM THE LINDEN CHEMICAL
AND PLASTIC SITE TO THE
AMPHIPOD, *LEPTOCHEIRUS PLUMULOSUS*
AND THE SHRIMP, *PENAEUS VANNAMEI*

June 14, 1995

REPORT # 5177 JOB #95-177

Samples Collected by:

Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679

TABLE OF CONTENTS

DRAFT

Report:	Toxicity evaluation of sediments from the Linden Chemical and Plastic Site to the amphipod *Leptocheirus plumulosus* and the brown shrimp, *Penaeus vannamei*
Sponsor:	Roy F. Weston, Inc. GSA Raritan Depot Building 209 Annex (Bay F) 2890 Woodbridge Avenue Edison, New Jersey 08837-3679
Testing Facility:	Aqua Survey, Inc. 499 Point Breeze Road Flemington, NJ 08822
Study Number:	95-177
Report:	5177
Date Study Started:	May 20, 1995
Date Reported:	May 14, 1995
Personnel:	A. Daly S. Douglas C. Ezzard N. Hardtmann M. Horne

W. Scott Douglas
Project Manager

Date

DRAFT

QUALITY ASSURANCE STATEMENT

Study No.: 95-177 Study Director: Scott Douglas

Study Type: Testing Sediment Toxicity with *Leptocheirus plumulosus* and *Penaeus vannamei*

Inspection Date	Inspection Description	Date Reported to Management
6/14/95	Inspection of raw data and statistics	6/15/95
6/14/95	Raw data and report	6/15/95

The report as well as all records and raw data were audited and found to be an accurate reflection of the study. Copies of raw data will be maintained by Aqua Survey, 499 Point Breeze Road, Flemington, New Jersey, 08822.

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Quality Assurance Officer Date

SUMMARY

Five sediment samples for toxicity testing were collected by Weston personnel and shipped under chain of custody to Aqua Survey, Inc. (ASI) and received in good condition from May 20 to 23, 1995. At the request of the client, samples were not sieved. Samples were placed in a cold room and held at 4°C until test setup. Both the amphipod and shrimp tests were set up under guidance provided to ASI by Roy F. Weston, Inc.

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Leptocheirus plumulosus

The toxicity of salt marsh sediments from the Linden Chemical and Plastic Site to the amphipod *Leptocheirus plumulosus* was assessed using a ten day acute toxicity test. Test response variables were survival and sediment avoidance. There were no observable behavioral differences between animals exposed to control and reference sediments and the test sediments. Likewise, there was no statistical difference in survival between all treatments (see below). Complete details of the amphipod test are presented in Section One of this report.

Penaeus vennamei

The toxicity of salt marsh sediments from the Linden Chemical and Plastic Site to the brown shrimp *Penaeus vannamei* was assessed using a ten day acute toxicity test. Test response variables were survival and sediment avoidance. There were no observable behavioral differences between animals exposed to control and reference sediments and the test sediments. Likewise, there was no statistical difference in survival between all treatments (see below). Complete details of the shrimp test are presented in Section Two of this report.

Percent survival of *L. plumulosus* and *P. vannamei*

Sediment sample	*L. plumulosus*		*P. vannamei*	
	Mean	St. Dev.	Mean	St. Dev.
Control	90	9	97	5
Reference	78	8	94	5
10-11	92	3	—	—
17-18	83	12	100	0
19-20	63	21	—	—
36	68	14	97	5

Determination of Organic Matter Composition

Ten samples for determination of organic matter composition by loss on ignition techniques were collected by Weston personnel and shipped under chain of custody to Aqua Survey, Inc. (ASI) and received in good condition from May 20 to 23, 1995. Organic matter composition was determined by a standard method provided to ASI by Roy F. Weston, Inc. The percent organic matter ranged from 0.359 to 4.524 %. More details of the organic matter composition analysis is provided in Section Three of this report.

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SECTION ONE - AMPHIPOD TEST

I. Objective

The objective of this test was to determine potential toxic effects of test sediments from the LCP site to a representative estuarine aquatic benthic invertebrate. The measure of potency was a significant reduction in survival and sediment avoidance compared to a control during a 10 day acute toxicity test.

II. Test Material

Source:	Roy F. Weston, Inc. GSA Raritan Depot Building 209 Annex (Bay F) 2890 Woodbridge Avenue Edison, New Jersey 08837-3679	
Name:	Reference	A-H01508
	Sample 10-11	A-H24160
	Sample 17-18	A-H01545
	Sample 19-20	B-I01546
	Sample 36	B-I01540
Date Received:	May 20-23, 1995	

III. Materials and Methods

A. Method

The method employed was outlined by Roy F. Weston, Inc. A summary of these testing conditions follows.

B. Test Organisms

Species

The test species for this test was *Leptocheirus plumulosus*, which is a representative estuarine benthic invertebrate.

Size/Physical Condition

Animals used in this test were 2-4 mm, and appeared to be in good condition.

Source/Acclimation

Organisms were obtained from East Coast Amphipod, and acclimated in the culture unit at Aqua Survey, Inc. Organisms were acclimated to 22 ppt seawater at 20.5°C for a period of 48 hr. prior to stocking. The total acclimation period was 8 days.

C. Test System

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Source of Overlay Water

Overlay water was filtered seawater, diluted to the correct salinity (22 ppt) with deionized water.

Test Temperature

20±2°C

Test Vessels

The test vessels were 1-liter HDPE tri-pour beakers covered with petri plates and gently aerated through borosilicate glass tipped aeration lines.

Photoperiod

The test was conducted on a 16h light/8h dark photoperiod.

D. Test Design

Test Levels

Three replicates of undiluted test sediment was tested and compared to three replicates of control sediment.

Control

Control sediment was obtained from Jenny Creek in Great Bay, near Tuckerton, New Jersey. This area is considered a pristine area in which to obtain control muds for these types of tests. The controls were run using 100% control sediment and the same number of organisms as the test concentrations.

E. Test Procedure

Sample Preparation

Samples were homogenized with a hand drill fitted with a stainless steel mixing blade. Control, reference, and sample sediment were not sieved by request of the client. Samples were examined for predators and indigenous organisms by spreading the sample into thin layers and examining it under light. Approximately 200 cm^3 of homogenized test (or control) sediment was placed into each of three replicate test vessels. The vessels were then gently filled with overlay water. The test system was allowed to settle under gentle aeration overnight.

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Beginning the Test

Test chambers were monitored for temperature, pH, salinity, and dissolved oxygen.

Animals were chosen at random, using a transfer pipet, from the culture dishes and counted into 10 ml polyethylene holding cups. The cups were floated on the surface of the test chamber for 30 minutes prior to the introduction of the organisms into the test chamber.

The test began when organisms were introduced to all chambers.

Daily Maintenance

Dissolved oxygen, pH, salinity, and temperature was determined daily in every test vessel.

All test chambers were examined daily and observed behaviors noted.

Animals were fed 1 mL of a suspension of 10 mg/ml "Leptos chow" every other day as required by the work plan. Leptos chow is 1:1:1:1 mixture of Neo-novum, Tetra-min fish flake food, cereal leaves, and crushed rabbit chow.

A 50% renewal of the overlay water was completed on day 2, 4, 6, and 8 of the test. Water chemistry parameters were measured before and after water renewal.

Test Duration

The test was 10 days in duration.

Ending the Test

At the conclusion of the test, dissolved oxygen, temperature, pH, and salinity were determined.

Animals were removed by sieving the sediment through a 1-mm mesh screen placed over a 0.5-mm screen. A gentle stream of water was used to remove the fine sediment. The material retained on both screens was examined carefully using a light table, forceps, and a counter.

Surviving organisms were saved in a 100-mL cup of fresh overlay water. The surviving amphipods were then placed into 10 ml glass vials and preserved by freezing for further potential chemical analysis by Weston. These samples will be sent to weston with the report.

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F. Reference Toxicant

A standard reference toxicant test (SRT) with $CdCl_2$ was performed during the time period in which the test was running. SRT data is used to assess the condition of the organisms being placed in a test. The organisms added to this test were intermediate in their tolerance to the standard toxicant.

G. Data Analysis

Once all data was collected, the data was entered into a Quattro spreadsheet and sorted. The results were tabulated and checked for accuracy. Data was then entered into Minitab and analyzed for homogeneity of variance and normality. Survival data was entered as the proportion of organisms surviving and subsequently arcsine square root transformed. Analysis of variance was performed on all data sets, since the data met the assumptions of normality and homoscedasticity. The one-way analysis was followed by Dunnett's multiple comparisons tests. A table of descriptive statistics was generated for each treatment.

IV. Results

Survival in the LCP site samples ranged from 63 to 92 % for *Leptocheirus plumulosus*. There were, however, no significant differences either behaviorally, or in terms of survival across all treatments. Control survival was 90%, which meets the control survival criteria for this test. Control survival criteria are that there is at least 90% overall survival and that survival in any one replicate does not fall below 80%. Dissolved oxygen concentrations ranged from 6.1 to 8.0 mg/L. pH ranged from 7.3 to 8.6. Salinity ranged from 21.0 to 23.0 ppt. Temperature ranged from 19.0 to 20.0°C. There were no statistically significant correlations between measured water chemistry parameters and survival of the organisms.

The Standard Reference Toxicant test indicated that the LC_{50} for the amphipod was 0.82 μg/L $CdCl_2$ with a 95% confidence interval from 0.65-1.03. This is within acceptable range of the sensitivity of this organism in other tests conducted at Aqua Survey, Inc. The organisms used in this test were about average in their response to the standard toxicant. A control chart is provided in the appendix.

V. Source of Documentation

All original data documentation is being maintained at:

Aqua Survey, Inc.
499 Point Breeze Road
Flemington, NJ 08822

Table 1.1

AQUA SURVEY, INC.
LIVE COUNT

CLIENT:	Roy F. Weston	TEST START DATE:	5/26/95	PARAMETER:	Live Count
JOB #:	95-177	INITIAL COUNT:	20	ORGANISM:	*L. plumulosus*

Position #	ID#	SAMPLE	FINAL COUNT	PERCENT SURVIVAL
12	0.1	Control	20	
10	0.2		17	
15	0.3		17	90
1	1.1	Reference	14	
13	1.2		17	
11	1.3		16	78
5	2.1	36	12	
3	2.2		17	
4	2.3		12	68
9	3.1	17-18	18	
7	3.2		18	
16	3.3		14	83
18	4.1	19-20	8	
2	4.2		14	
6	4.3		16	63
8	5.1	10-11	18	
14	5.2		19	
17	5.3		18	92

JN QC 6/14/

Table 1.2

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Roy F. Weston　　TEST START DATE: 5/26/95　　PARAMETER: Temperature

JOB #: 95-177　　ORGANISM: *L. plumulosus*

INITIAL READINGS

Position	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control	19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
10	0.2		19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
15	0.3		19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0	19.0	20.0
1	1.1	Reference	19.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
13	1.2		19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
11	1.3		19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0	19.0	20.0
5	2.1	36	19.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
3	2.2		19.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
4	2.3		19.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0	19.0	20.0
9	3.1	17-18	19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
7	3.2		19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
16	3.3		19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0	19.0	20.0
18	4.1	19-20	19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
2	4.2		19.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
6	4.3		19.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0	19.0	20.0
8	5.1	10-11	19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
14	5.2		19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0		
17	5.3		19.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0	19.0	20.0
											Ranges			19.0	20.0

Table 1.3

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT Roy F. Weston | TEST START DATE: 5/26/95 | PARAMETER: Temperature

JOB #: 95-177 | ORGANISM: *L. plumulosus*

			FINAL READINGS											
Position	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control			20.0		20.0		20.0		19.0				
10	0.2				20.0		20.0		20.0		19.0				
15	0.3				20.0		20.0		20.0		19.0			19.0	20.0
1	1.1	Reference			20.0		20.0		20.0		19.0				
13	1.2				20.0		20.0		20.0		19.0				
11	1.3				20.0		20.0		20.0		19.0			19.0	20.0
5	2.1	36			20.0		20.0		20.0		19.0				
3	2.2				20.0		20.0		20.0		19.0				
4	2.3				20.0		20.0		20.0		19.0			19.0	20.0
9	3.1	17-18			20.0		20.0		20.0		19.0				
7	3.2				20.0		20.0		20.0		19.0				
16	3.3				20.0		20.0		20.0		19.0			19.0	20.0
18	4.1	19-20			20.0		20.0		20.0		19.0				
2	4.2				20.0		20.0		20.0		19.0				
6	4.3				20.0		20.0		20.0		19.0			19.0	20.0
8	5.1	10-11			20.0		20.0		20.0		19.0				
14	5.2				20.0		20.0		20.0		19.0				
17	5.3				20.0		20.0		20.0		19.0			19.0	20.0
											Ranges			19.0	20.0

6/14

Table 1.4

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT Roy F. Weston   TEST START DATE: 5/26/95   PARAMETER: D.O.

JOB #: 95-177   ORGANISM: *L. plumulosus*

INITIAL READINGS

Position	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control	6.3	7.8	6.7	7.4	7.3	7.2	7.2	7.4	7.3	7.6	7.4		
10	0.2		6.2	7.9	7.0	7.4	7.4	7.4	7.3	7.5	7.3	7.6	7.5		
15	0.3		6.2	7.8	7.0	7.4	7.4	7.6	7.3	7.4	7.3	7.6	7.5	6.2	7.9
1	1.1	Reference	6.1	7.8	6.2	7.4	7.1	7.0	6.9	7.3	7.3	7.6	7.5		
13	1.2		6.3	7.9	7.2	7.4	7.5	7.6	7.5	7.4	7.3	7.6	7.4		
11	1.3		6.3	7.9	7.2	7.4	7.4	7.5	7.3	7.4	7.3	7.6	7.5	6.1	7.9
5	2.1	36	6.3	7.8	7.0	7.4	7.0	7.3	7.2	7.3	7.3	7.6	7.5		
3	2.2		6.3	7.8	7.0	7.4	7.1	7.2	7.0	7.3	7.3	7.6	7.5		
4	2.3		6.2	7.8	6.8	7.4	7.2	7.2	7.1	7.3	7.3	7.6	7.5	6.2	7.8
9	3.1	17-18	6.2	7.9	7.2	7.4	7.4	7.4	7.4	7.5	7.3	7.6	7.4		
7	3.2		6.3	7.8	7.0	7.4	7.1	7.3	7.3	7.4	7.3	7.6	7.4		
16	3.3		6.3	7.8	6.9	7.4	7.4	7.5	7.4	7.4	7.4	7.6	7.4	6.2	7.9
18	4.1	19-20	6.2	7.9	7.0	7.4	7.4	7.5	7.5	7.4	7.3	7.6	7.5		
2	4.2		6.3	7.8	6.6	7.4	7.1	7.0	7.0	7.3	7.3	7.6	7.4		
6	4.3		6.1	7.8	6.8	7.4	7.1	7.2	7.2	7.3	7.3	7.6	7.5	6.1	7.9
8	5.1	10-11	6.3	7.9	7.1	7.4	7.3	7.4	7.4	7.3	7.3	7.6	7.5		
14	5.2		6.3	7.9	6.8	7.4	7.4	7.5	7.4	7.3	7.3	7.6	7.5		
17	5.3		6.3	7.9	7.0	7.4	7.4	7.5	7.4	7.4	7.3	7.6	7.5	6.3	7.9
										Ranges				6.1	7.9

Table 1.5

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT Roy F. Weston TEST START DATE: 5/26/95 PARAMETER: D.O.

JOB #: 95-177 ORGANISM: *L. plumulosus*

FINAL READINGS

Position	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control			8.0		7.0		7.3		7.1				
10	0.2				8.0		7.0		7.2		7.1				
15	0.3				8.0		7.0		7.3		7.1			7.0	8.0
1	1.1	Reference			8.0		7.0		7.1		7.1				
13	1.2				8.0		7.0		7.2		7.1				
11	1.3				8.0		7.0		7.2		7.1			7.0	8.0
5	2.1	36			8.0		7.0		7.2		7.1				
3	2.2				8.0		7.0		7.2		7.1				
4	2.3				7.9		7.0		7.2		7.1			7.0	8.0
9	3.1	17-18			8.0		7.0		7.2		7.1				
7	3.2				8.0		7.0		7.3		7.1				
16	3.3				7.9		7.0		7.3		7.1			7.0	8.0
18	4.1	19-20			8.0		7.0		7.3		7.1				
2	4.2				8.0		7.0		7.0		7.1				
6	4.3				8.0		7.0		7.2		7.1			7.0	8.0
8	5.1	10-11			8.0		7.0		7.3		7.1				
14	5.2				8.0		7.0		7.2		7.1				
17	5.3				8.0		7.0		7.3		7.1			7.0	8.0
												Ranges		7.0	8.0

AQUA SURVEY, INC.

Table 1.6

SOLID PHASE READINGS

CLIENT: Roy F. Weston   TEST START DATE: 5/26/95   PARAMETER: pH

JOB #: 95-177   ORGANISM: *L. plumulosus*

INITIAL READINGS

Position	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control	7.4	7.9	8.0	8.2	8.2	8.1	8.2	8.5	8.4	8.2	8.6		
10	0.2		7.3	7.9	8.1	8.2	8.1	8.0	8.3	8.5	8.4	8.2	8.5		
15	0.3		7.4	7.9	8.2	8.2	8.1	8.1	8.3	8.5	8.4	8.2	8.5	7.3	8.6
1	1.1	Reference	7.3	7.8	7.8	7.9	7.9	7.8	8.0	8.1	8.2	8.2	8.1		
13	1.2		7.3	7.9	8.1	8.2	8.2	8.0	7.9	8.1	8.2	8.2	8.0		
11	1.3		7.3	7.9	8.1	8.2	8.2	8.0	7.9	8.2	8.2	8.2	8.1	7.3	8.2
5	2.1	36	7.3	7.9	8.0	8.1	8.0	7.9	7.9	8.1	8.1	8.2	8.1		
3	2.2		7.3	7.8	8.0	8.0	8.0	7.9	8.0	8.1	8.1	8.2	8.0		
4	2.3		7.3	7.9	8.1	8.1	8.0	7.9	8.0	8.2	8.1	8.2	8.1	7.3	8.2
9	3.1	17-18	7.3	7.9	8.0	8.1	8.1	7.9	7.8	8.0	8.2	8.2	8.0		
7	3.2		7.3	7.9	7.9	8.1	8.0	7.9	7.9	8.1	8.1	8.2	8.0		
16	3.3		7.4	8.0	8.0	8.1	8.2	8.1	7.8	8.1	8.1	8.2	8.0	7.3	8.2
18	4.1	19-20	7.3	7.9	8.1	8.2	8.1	8.0	8.0	8.2	8.2	8.2	8.1		
2	4.2		7.4	7.8	8.0	8.0	8.0	7.9	8.0	8.1	8.1	8.2	/ 8.0		
6	4.3		7.3	7.9	8.0	8.1	8.0	7.9	8.0	8.1	8.1	8.2	8.0	7.3	8.2
8	5.1	10-11	7.3	7.9	8.0	8.1	8.0	7.9	8.0	8.1	8.1	8.2	8.1		
14	5.2		7.3	7.9	8.0	8.1	8.2	8.0	7.9	8.1	8.2	8.2	8.0		
17	5.3		7.3	8.0	8.0	8.1	8.1	8.0	7.9	8.1	8.1	8.2	8.0	7.3	8.2
												Ranges		7.3	8.6

JW QC 6/1

Table 1.7

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Roy F. Weston | TEST START DATE: 5/26/95 | PARAMETER: pH

B #: 95-177 | ORGANISM: *L. plumulosus*

FINAL READINGS

Position	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control			8.0		8.0		8.4		7.8				
10	0.2				8.0		8.0		8.4		7.8				
15	0.3				8.0		8.0		8.4		7.8			7.8	8.4
1	1.1	Reference			7.9		8.0		8.4		7.8				
13	1.2				8.0		8.0		8.4		7.8				
11	1.3				8.0		8.0		8.4		7.8			7.8	8.4
5	2.1	36			8.0		8.0		8.4		7.8				
3	2.2				8.0		8.0		8.4		7.8				
4	2.3				8.0		8.0		8.4		7.8			7.8	8.4
9	3.1	17-18			8.0		8.0		8.4		7.8				
7	3.2				7.9		8.0		8.4		7.8				
16	3.3				8.0		8.0		8.4		7.8			7.8	8.4
18	4.1	19-20			8.0		8.0		8.4		7.8				
2	4.2				7.9		8.0		8.4		7.8				
6	4.3				8.0		8.0		8.4		7.8			7.8	8.4
8	5.1	10-11			8.0		8.0		8.4		7.8				
14	5.2				7.9		8.0		8.4		7.8				
17	5.3				8.0		8.0		8.4		7.8			7.8	8.4
											Ranges			7.8	8.4

JL
QC
6/11

Table 1.8

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT Roy F. Weston   TEST START DATE: 5/26/95   PARAMETER: Salinity

JOB #: 95-177   ORGANISM: *L. plumulosus*

INITIAL READINGS

Position	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control	21.5	21.5	23.0	22.0	22.5	22.0	22.5	22.0	22.0	22.0	22.5		
10	0.2		21.5	21.5	23.0	21.0	22.5	22.0	23.0	22.0	22.0	22.0	22.5		
15	0.3		21.5	21.0	23.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.5	21.0	23.0
1	1.1	Reference	21.5	21.0	21.0	21.0	21.0	22.0	22.0	22.0	22.0	22.0	22.5		
13	1.2		21.5	21.0	21.0	22.0	21.0	22.0	21.5	22.0	22.0	22.0	22.5		
11	1.3		21.5	21.0	21.0	22.0	21.0	22.0	22.0	22.0	22.0	22.0	22.5	21.0	22.5
5	2.1	36	21.5	21.0	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.5		
3	2.2		21.5	21.0	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	23.0		
4	2.3		21.5	21.0	22.0	22.0	22.0	22.0	23.0	22.0	22.0	22.0	22.5	21.0	23.0
9	3.1	17-18	21.5	21.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.5		
7	3.2		21.5	21.0	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.5		
16	3.3		21.5	21.0	22.5	22.0	21.5	22.0	22.0	22.0	22.0	22.0	22.5	21.0	22.5
18	4.1	19-20	21.5	21.0	22.0	21.5	21.5	22.0	22.0	22.0	22.0	22.0	22.0		
2	4.2		21.5	21.0	22.0	21.5	22.0	22.0	22.5	22.0	22.0	22.0	22.5		
6	4.3		21.5	21.0	22.0	22.0	21.5	22.0	22.0	22.0	22.0	22.0	22.5	21.0	22.5
8	5.1	10-11	21.5	21.0	22.0	22.0	22.0	22.0	22.5	22.0	22.0	22.0	22.5		
14	5.2		21.5	21.0	22.0	22.0	21.5	22.0	22.0	22.0	22.0	22.0	22.5		
17	5.3		21.5	21.0	22.0	21.5	21.5	22.0	22.0	22.0	22.0	22.0	22.5	21.0	22.5
												Ranges		21.0	23.0

JN
QC
6/11

AQUA SURVEY, INC.
SOLID PHASE READINGS

Table 1.9

IENT: Roy F. Weston | TEST START DATE: 5/26/95 | PARAMETER: Salinity

B #: 95-177 | ORGANISM: *L. plumulosus*

FINAL READINGS

Position	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control			22.0		22.0		22.0		21.0				
10	0.2				22.0		22.0		22.0		21.0				
15	0.3				22.0		22.0		22.0		21.0			21.0	22.0
1	1.1	Reference			22.0		22.0		21.5		21.0				
13	1.2				22.0		22.0		22.0		21.0				
11	1.3				22.0		22.0		22.0		21.0			21.0	22.0
5	2.1	36			22.0		22.0		22.0		21.0				
3	2.2				22.0		22.0		22.0		21.0				
4	2.3				22.0		22.0		22.0		21.0			21.0	22.0
9	3.1	17-18			22.0		22.0		22.0		21.0				
7	3.2				22.0		22.0		22.0		21.0				
16	3.3				22.0		22.0		22.0		21.0			21.0	22.0
18	4.1	19-20			22.0		22.0		22.0		21.0				
2	4.2				22.0		22.0		22.0		21.0				
6	4.3				22.0		22.0		22.0		21.0			21.0	22.0
8	5.1	10-11			22.0		22.0		22.0		21.0				
14	5.2				22.0		22.0		22.0		21.0				
17	5.3				22.0		22.0		22.0		21.0			21.0	22.0
											Ranges			21.0	22.0

JD QC
6/14/

Table 1.10

Results of 96-hour Standard Reference Toxicant Bioassays with Cadmium Chloride.

Conc. (μg/L)	Final Live Counts *L. plumulosus*
Control	27
0.30	25
0.55	20
1.00	13
1.80	8
3.20	1

LC_{50} = 0.82 μg/L $CdCl_2$ (0.65-1.03)

Table 1.11

Chemical/Physical Data Ranges for *L.plumulosus* Standard Reference Toxicant Test with Cadmium Chloride

Conc. (mg/L)	Temp. (°C)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)
0.00	19.0-20.0	7.2-8.3	7.7-8.1	25.0-25.5
0.30	19.0-20.0	7.3-8.3	7.7-8.1	25.0-25.5
0.55	19.0-20.0	7.3-8.3	7.7-8.1	25.0-25.5
1.00	19.0-20.0	7.2-8.3	7.8-8.1	25.0-25.5
1.80	19.0-20.0	7.4-8.3	7.7-8.1	25.0-25.5
3.20	19.0-20.0	7.3-8.3	7.8-8.1	25.0-25.5

SECTION TWO - BROWN SHRIMP TEST

I. Objective

The objective of this test was to determine potential toxic effects of test sediments from the LCP site to a representative estuarine aquatic benthic invertebrate. The measure of potency was a significant reduction in survival and sediment avoidance compared to a control during a 10 day acute toxicity test.

II. Test Material

DRAFT

Source:	Roy F. Weston, Inc. GSA Raritan Depot Building 209 Annex (Bay F) 2890 Woodbridge Avenue Edison, New Jersey 08837-3679	
Name:	Reference	A-H01508
	Sample 17-18	A-H01545
	Sample 36	B-I01540
Date Received:	May 20-23, 1995	

III. Materials and Methods

A. Method

The method employed was outlined by Roy F. Weston, Inc. A summary of these testing conditions follows.

B. Test Organisms

Species

The test species for this test was *Penaeus vannamei*, which is a representative salt marsh epibenthic invertebrate.

Size/Age/Physical Condition

Animals used in this test were 20-30 mm, approximately 4 weeks old, and appeared to be in good condition.

Source/Acclimation

Organisms were obtained from Aquatic Research Organisms, and acclimated in the culture unit at Aqua Survey, Inc. Organisms were acclimated to 22 ppt seawater at 20.5°C for a period of 48 hr. prior to stocking. The total acclimation period for this organism was 6 days.

C. Test System

Source of Overlay Water

Overlay water was filtered seawater, diluted to the correct salinity (22 ppt) with deionized water.

Test Temperature

20±2°C

DRAFT

Test Vessels

The test vessels were 4-liter polyethylene containers covered with 1 mm mesh netting to prevent organism escape. They were gently aerated through borosilicate glass tipped aeration lines.

Photoperiod

The test was conducted on a 16h light/8h dark photoperiod.

D. Test Design

Test Levels

Three replicates of undiluted test sediment was tested and compared to three replicates of control sediment.

Control

Control sediment was obtained from Jenny Creek in Great Bay, near Tuckerton, New Jersey. This area is considered a pristine area in which to obtain control muds for these types of tests. The controls were run using 100% control sediment and the same number of organisms as the test concentrations.

E. Test Procedure

Sample Preparation

Samples were homogenized with a hand drill fitted with a stainless steel mixing blade. Control, reference, and sample sediment were not sieved by request of the client. Samples were then examined for predators and indigenous organisms. Approximately 400 cm^3 of homogenized test (or control) sediment was placed into each of three replicate test vessels. The vessels were then gently filled with overlay water. The test system was allowed to settle under gentle aeration overnight.

DRAFT

Beginning the Test

Test chambers were monitored for temperature, pH, salinity, and dissolved oxygen.

Animals were chosen at random, using a transfer pipet, from the culture dishes and counted into 10 ml polyethylene holding cups. The cups were floated on the surface of the test chamber for 30 minutes prior to the introduction of the organisms into the test chamber.

The test began when organisms were introduced to all chambers.

Daily Maintenance

Dissolved oxygen, pH, salinity, and temperature was determined daily in every test vessel.

All test chambers were examined daily and observed behaviors noted.

Animals were fed 1 mL of concentrated *Artemia* every other day as required by Weston.

A 50% renewal of the overlay water was completed on day 2, 4, 6, and 8 of the test. Water chemistry parameters were measured after each renewal.

Test Duration

The test was 10 days in duration.

Ending the Test

At the conclusion of the test, dissolved oxygen, temperature, pH, and salinity were determined .

Since the animals are epibenthic, animals were removed by gently pouring off the overlay water. Survival was then enumerated.

Surviving organisms were saved in a 100-mL cup of fresh overlay water. The surviving amphipods were then placed into 10 ml glass vials and preserved by freezing for further potential chemical analysis by Weston.

F. Reference Toxicant

DRAFT

A standard reference toxicant test (SRT) with $CdCl_2$ was performed during the time period in which the test was running. SRT data is used to assess the condition of the organisms being placed in a test. The organisms added to this test were intermediate in their tolerance to the standard toxicant.

G. Data Analysis

Once all data was collected, the data was entered into a Quattro spreadsheet and sorted. The results were tabulated and checked for accuracy. Data was then entered into Minitab and analyzed for homogeneity of variance and normality. Survival data was entered as the proportion of organisms surviving and subsequently arcsine square root transformed. Analysis of variance was performed on all data sets, since the data met the assumptions of normality and homoscedasticity. The one-way analysis was followed by Dunnett's multiple comparisons tests. A table of descriptive statistics was generated for each treatment.

IV. Results

Survival in the LCP site samples ranged from 93.9 to 100 % for *Penaeus vannamei*. There were no significant differences either behaviorally, or in terms of survival across all treatments. Control survival was 97% which met our testing survival criteria. Control survival criteria are that there is at least 90% overall survival and that survival in any one replicate does not fall below 80%. Dissolved oxygen concentrations ranged from 6.1 to 7.9 mg/L. pH ranged from 7.3 to 8.6. Salinity ranged from 21.0-23.5 ppt. Temperature ranged from 19.0 to 20.0°C. There were no statistically significant correlations between measured water chemistry parameters and survival of the organisms.

The Standard Reference Toxicant test indicated that the LC_{50} for the brown shrimp was 4.22 μg/L $CdCl_2$ with a 95% confidence interval from 3.57-4.99. Since the brown shrimp has never been utilized for toxicity screening at Aqua Survey, Inc., we have no control charts with which to compare this data. We can only qualify this by the fact that the animals appeared to be healthy upon addition to the test chambers and survived quite well during the test.

V. Source of Documentation

All original data documentation is being maintained at:

Aqua Survey, Inc.
499 Point Breeze Road
Flemington, NJ 08822

Table 2.1

AQUA SURVEY, INC.
LIVE COUNT

CLIENT:	Roy F. Weston	TEST START DATE:	5/26/95	PARAMETER:	Live Count
JOB #:	95-177	INITIAL COUNT:	11	ORGANISM:	*P. vannamei*

Position #	ID#	SAMPLE	FINAL COUNT	PERCENT SURVIVAL
12	0.1	Control	11	
5	0.2		11	
9	0.3		10	97
10	1.1	Reference	11	
3	1.2		10	
11	1.3		10	94
8	2.1	36	10	
7	2.2		11	
2	2.3		11	97
4	3.1	17-18	11	
1	3.2		11	
6	3.3		11	100

JN
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6/14

Table 2.2

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Roy F. Weston

JOB #: 95-177

TEST START DATE: 5/26/95

PARAMETER: Temperature

ORGANISM: *P.* [illegible]

INITIAL READINGS

Position #	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control	19.0	19.5	19.5	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0		
5	0.2		19.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0		
9	0.3		19.0	19.5	19.5	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0	19.0	20.0
10	1.1	Reference	19.0	19.5	19.5	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0		
3	1.2		19.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0		
11	1.3		19.0	19.5	19.5	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0	19.0	20.0
8	2.1	36	19.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0		
7	2.2		19.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0		
2	2.3		19.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0	19.0	20.0
4	3.1	17-18	19.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0		
1	3.2		19.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0		
6	3.3		19.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0	19.0	20.0
												Ranges		19.0	20.0

JR
QC
6/14/(

Table 2.3

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Roy F. Weston TEST START DATE: 5/26/95 PARAMETER: Temperature

JOB #: 95-177 ORGANISM: *P. vannamei*

FINAL READINGS

Position #	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control			20.0		20.0		20.0		19.0				
5	0.2				20.0		20.0		20.0		19.0				
9	0.3				20.0		20.0		20.0		19.0			19.0	20.0
10	1.1	Reference			20.0		20.0		20.0		19.0				
3	1.2				20.0		20.0		20.0		19.0				
11	1.3				20.0		20.0		20.0		19.0			19.0	20.0
8	2.1	36			20.0		20.0		20.0		19.0				
7	2.2				20.0		20.0		20.0		19.0				
2	2.3				20.0		20.0		20.0		19.0			19.0	20.0
4	3.1	17-18			20.0		20.0		20.0		19.0				
1	3.2				19.5		20.0		20.0		19.0				
6	3.3				20.0		20.0		20.0		19.0			19.0	20.0
												Ranges		19.0	20.0

JW
QC
6/14/9

Table 2.4

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Roy F. Weston　　TEST START DATE: 5/26/95　　PARAMETER: D.O.

JOB #: 95-177　　ORGANISM: P. [illegible]

INITIAL READINGS

Position #	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control	6.2	7.9	7.4	7.5	7.6	7.4	7.5	7.4	7.3	7.6	7.4		
5	0.2		6.1	7.8	7.2	7.6	7.6	7.6	7.5	7.4	7.3	7.6	7.5		
9	0.3		6.2	7.8	7.0	7.6	7.5	7.4	7.1	7.4	7.3	7.6	7.4	6.1	7.9
10	1.1	Reference	6.3	7.8	7.2	7.6	7.5	7.5	7.3	7.3	7.3	7.6	7.4		
3	1.2		6.3	7.7	7.1	7.6	7.6	7.6	7.5	7.3	7.3	7.6	7.5		
11	1.3		6.3	7.9	7.4	7.6	7.5	7.5	7.5	7.4	7.3	7.6	7.4	6.3	7.9
8	2.1	36	6.2	7.9	7.4	7.6	7.5	7.6	7.5	7.4	7.4	7.6	7.5		
7	2.2		6.2	7.9	7.2	7.6	7.5	7.6	7.5	7.4	7.3	7.6	7.5		
2	2.3		6.3	7.7	7.2	7.6	7.5	7.6	7.5	7.4	7.3	7.6	7.4	6.2	7.9
4	3.1	17-18	6.3	7.8	7.4	7.6	7.5	7.6	7.5	7.4	7.3	7.6	7.4		
1	3.2		6.1	7.6	7.2	7.6	7.5	7.6	7.5	7.4	7.3	7.6	7.5		
6	3.3		6.2	7.8	7.4	7.6	7.5	7.6	7.5	7.4	7.3	7.6	7.5	6.1	7.8
											Ranges			6.1	7.9

50 @ 6/14

Table 2.5

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Roy F. Weston   TEST START DATE: 5/26/95   PARAMETER: D.O.
JOB #: 95-177   ORGANISM: P. [redacted]

FINAL READINGS

Position #	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control			7.8		7.3		7.4		7.1				
5	0.2				7.8		7.3		7.4		7.1				
9	0.3				7.9		7.3		7.4		7.1			7.1	7.9
10	1.1	Reference			7.9		7.3		7.4		7.1				
3	1.2				7.9		7.3		7.3		7.1				
11	1.3				7.9		7.3		7.3		7.1			7.1	7.9
8	2.1	36			7.9		7.3		7.4		7.1				
7	2.2				7.9		7.3		7.3		7.1				
2	2.3				7.8		7.3		7.3		7.1			7.1	7.9
4	3.1	17-18			7.8		7.3		7.3		7.1				
1	3.2				7.8		7.3		7.3		7.1				
6	3.3				7.8		7.3		7.3		7.1			7.1	7.8
												Ranges		7.1	7.9

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QC
6/14

Table 2.6

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Roy F. Weston TEST START DATE: 5/26/95 PARAMETER: pH

JOB #: 95-177 ORGANISM: *P. vannamei*

INITIAL READINGS

Position #	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control	7.4	8.0	8.2	8.2	8.3	8.2	8.4	8.2	8.2	8.2	8.4		
5	0.2		7.3	8.0	8.2	8.3	8.3	8.2	8.4	8.5	8.3	8.2	8.4		
9	0.3		7.3	8.0	8.1	8.2	8.3	8.2	8.4	8.3	8.2	8.2	8.5	7.3	8.5
10	1.1	Reference	7.3	8.0	8.0	8.3	8.1	8.2	8.0	8.2	8.2	8.2	8.0		
3	1.2		7.4	8.0	7.9	8.1	8.1	8.2	8.0	8.1	8.2	8.2	7.9		
11	1.3		7.3	8.0	8.0	8.2	8.1	8.2	8.0	8.3	8.3	8.2	8.0	7.3	8.3
8	2.1	36	7.4	8.0	8.1	8.2	8.1	8.2	8.3	8.2	8.2	8.2	8.0		
7	2.2		7.3	8.0	8.1	8.2	8.2	8.2	8.2	8.1	8.2	8.2	8.0		
2	2.3		7.3	8.0	8.1	8.2	8.1	8.2	8.0	8.2	8.2	8.2	8.0	7.3	8.3
4	3.1	17-18	7.3	8.0	8.0	8.1	8.1	8.2	8.0	8.1	8.2	8.2	8.0		
1	3.2		7.3	8.0	7.9	8.2	8.1	8.2	7.9	8.1	8.2	8.2	8.0		
6	3.3		7.4	8.0	8.0	8.2	8.2	8.2	8.2	8.1	8.2	8.2	8.0	7.3	8.2
											Ranges			7.3	8.5

JN
QC
6/11

Table 2.7

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Roy F. Weston | TEST START DATE: 5/26/95 | PARAMETER: pH
JOB #: 95-177 | ORGANISM: *P. vannamei*

FINAL READINGS

Position #	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control			8.0		8.0		8.4		7.8				
5	0.2				8.0		8.0		8.6		7.8				
9	0.3				8.0		8.0		8.6		7.8			7.8	8.6
10	1.1	Reference			8.0		8.0		8.4		7.8				
3	1.2				8.1		8.0		8.3		7.8				
11	1.3				8.0		8.0		8.5		7.8			7.8	8.5
8	2.1	36			8.0		8.0		8.3		7.8				
7	2.2				8.0		8.0		8.4		7.8				
2	2.3				8.0		8.0		8.2		7.8			7.8	8.4
4	3.1	17-18			8.0		8.0		8.2		7.8				
1	3.2				8.0		8.0		8.2		7.8				
6	3.3				8.0		8.0		8.5		7.8			7.8	8.5
												Ranges		7.8	8.6

JR
QC
6/1

Table 2.8

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Roy F. Weston   TEST START DATE: 5/26/95   PARAMETER: Salinity

JOB #: 95-177   ORGANISM: P. vannamei

INITIAL READINGS

Position #	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control	21.5	21.0	23.0	22.0	22.5	22.0	22.5	22.0	22.0	22.0	22.5		
5	0.2		21.5	21.0	23.5	22.0	22.5	22.0	22.5	22.0	22.0	22.0	22.5		
9	0.3		21.5	21.5	23.5	22.0	22.5	22.0	22.5	22.0	22.0	22.0	22.0	21.0	23.[illegible]
10	1.1	Reference	21.5	21.0	22.0	22.0	21.0	22.0	22.5	22.0	22.0	22.0	22.5		
3	1.2		21.5	21.0	22.0	22.0	21.0	22.0	22.0	22.0	22.0	22.0	22.5		
11	1.3		21.5	21.5	22.0	22.0	21.0	22.0	22.5	22.0	22.0	22.0	22.5	21.0	22.5
8	2.1	36	21.5	21.5	23.0	22.0	21.5	22.0	22.5	22.0	22.0	22.0	22.5		
7	2.2		21.5	21.5	23.0	22.0	21.5	22.0	22.5	22.0	22.0	22.0	22.5		
2	2.3		21.5	21.0	23.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.5	21.0	23.[illegible]
4	3.1	17-18	21.5	21.0	23.0	22.0	21.0	22.0	22.0	22.0	22.0	22.0	22.5		
1	3.2		21.5	21.0	23.0	22.0	21.0	22.0	22.0	22.0	22.0	22.0	22.5		
6	3.3		21.5	21.0	23.0	22.0	21.5	22.0	22.5	22.0	22.0	22.0	22.5	21.0	23.0
												Ranges		21.0	23.[illegible]

JN
QC
6/1

Table 2.9

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Roy F. Weston | TEST START DATE: 5/26/95 | PARAMETER: Salinity

JOB #: 95-177 | ORGANISM: *P. vannamei*

FINAL READINGS

Position #	ID#	Sample	0	1	2	3	4	5	6	7	8	9	10	Low	High
12	0.1	Control			22.0		22.0		22.0		21.0				
5	0.2				22.0		22.0		22.0		21.0				
9	0.3				22.0		22.0		22.0		21.0			21.0	22.0
10	1.1	Reference			22.0		22.0		22.0		21.0				
3	1.2				22.0		22.0		22.0		21.0				
11	1.3				22.0		22.0		22.0		21.0			21.0	22.0
8	2.1	36			22.0		22.0		22.0		21.0				
7	2.2				22.0		22.0		22.0		21.0				
2	2.3				22.0		22.0		22.0		21.0			21.0	22.0
4	3.1	17-18			22.0		22.0		22.0		21.0				
1	3.2				22.0		22.0		22.0		21.0				
6	3.3				22.0		22.0		22.0		21.0			21.0	22.0
													Ranges	21.0	22.0

JW QC 6/14/4

Table 2.10

Results of 96-hour Standard Reference Toxicant Bioassays with Cadmium Chloride.

Conc. (μg/L)	Final Live Counts *P. vannamei*
Control	30
1.2	30
2.2	24
4.0	16
7.2	8
13.0	0

LC_{50} = 4.22 μg/l $CdCl_2$ (3.57-4.99)

Table 2.11

Chemical/Physical Data Ranges for *P. vannamei* Standard Reference Toxicant Test with Cadmium Chloride

Conc. (mg/L)	Temp. (°C)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)
0.00	18.5-20.0	5.6-7.8	7.9-8.4	21.0-22.0
1.20	18.5-20.0	5.9-8.0	8.0-8.4	21.0-22.0
2.20	18.5-20.0	5.8-7.9	7.9-8.4	21.0-22.0
4.00	18.5-20.0	6.0-8.0	8.0-8.4	21.0-22.0
7.20	18.5-20.0	5.4-7.9	8.0-8.4	21.0-22.0
13.00	18.5-20.0	5.8-7.8	8.1-8.5	21.0-22.0

SECTION THREE - ORGANIC MATTER DETERMINATION

I. OBJECTIVE

The objective of these analyses was to determine organic matter content for 10 salt marsh samples from the Linden Chemical and Plastic Site following methods provided to ASI by Roy F. Weston, Inc.

II. TEST MATERIAL

DRAFT

Source: LCP Chemical and Plastics Site

Samples:

Sample	**Number**
Reference	I01508
LCP 10-11	I24160
LCP 43	E24161
LCP 44	E24162
LCP 45	E24163
LCP 46	I24164
SED 17-18	I01545
SED 19-20	A01546
SED 35	C01510
SED 36	A01540

III. MATERIALS AND METHODS

A. Method

The method for loss on ignition organic content analysis was provided to ASI by Roy F. Weston, Inc

B. Sample Preparation

Sediment samples were homogenized with a stainless steel mixer, and analyzed as outlined in the protocol provided by Weston.

IV. RESULTS

The results of the analyses are provided in the table below. Total organic composition ranged from 0.78 to 4.52%.

Organic Matter Composition of 10 samples from the LCP site

Sample	Number	Percent Organic Matter
Reference	I01508	3.61
LCP 10-11	I24160	4.16
LCP 43	E24161	2.97
LCP 44	E24162	4.52
LCP 45	E24163	3.06
LCP 46	I24164	4.42
SED 17-18	I01545	1.27
SED 19-20	A01546	0.78
SED 35	C01510	1.73
SED 36	A01540	0.36

DRAFT

V. SOURCE OF DOCUMENTATION

All original data documentation is being maintained at:

Aqua Survey, Inc.
499 Point Breeze Road
Flemington, NJ 08822

A

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X

A

Roy F. Weston 95-177

L. plumulosus

Randomized by JN Minitab 5/23/95

	Beaker	Sample	Sediment	ASI No
20 ~~17~~	12	Control		*
17	10	Control		*
17	15	Control		*
14	1	Reference	A-H01508	5001
17	13	Reference	A-H01508	5001
16	11	Reference	A-H01508	5001
12	5	36	B-I01540	5007
17	3	36	B-I01540	5007
12	4	36	B-I01540	5007
18	9	17-18	A-H01545	5008
18	7	17-18	A-H01545	5008
14	16	17-18	A-H01545	5008
8	18	19-20	B-I01546	5005
14	2	19-20	B-I01546	5005
16	6	19-20	B-I01546	5005
18	8	10-11	A-H24160	5018
19	14	10-11	A-H24160	5018
18	17	10-11	A-H24160	5018

AQUA SURVEY, INC.

LIVE COUNTS

CLIENT: WESTON
JOB #: 95-177

INITIAL COUNTS: 20

TEST START DATE: 5/26/95
ORGANISM: L. plumulosus

Chamber #	ID #	Test Counts						Final		Sample Codes
		Day 1		Day 2		Day 3		#	Init.	
		#	Init.	#	Init.	#	Init.			
1		14	20	14						
2		14	20	14						
3		17	20	17						
4		13	20	12						
5		12	20	12						
6		16	20	16						
7		18	20	18						
8		18	20	18						
9		18	20	18						
10		17	20	17						
11		16	20	16						
12		20	20	20						
13		17	20	17						
14		19	20	19						
15		17	20	17						
16		14	20	14						
17		18	20	18						
18		8	20	8						
19										
20										
Date	6/5/95									
Initials	MTH									

NOTES:

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston
JOB #: 95-177

TEST START DATE: 5-26-95
ORGANISM LOG #: 95-0056

PARAMETER: Temperature

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		19.0	20.0	20.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
2		19.0	20.0	20.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
3		19.0	20.0	20.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
4		19.0	20.0	20.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
5		19.0	20.0	20.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
6		19.0	20.0	20.0	19.5	20.0	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
7		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
8		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
9		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
10		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
11		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
12		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
13		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
14		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
15		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
16		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
17		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
18		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.5	20.0	19.0	19.0	20.0	19.0
Initials		MTH	MTH	MTH	NMW	AMD	MTH AMD	MTH NMW	ES MTH	ES MTH	MTH CLE	MTH	MTH	MTH
Date		5/26	5/26	5/26	5/27	5/28	5/29	5/30	5/31	6/1	6/2	6/3	6/4	6/5

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston
JOB #: 95-177

TEST START DATE: 5-26-95
ORGANISM LOG #: 95-0056

PARAMETER: Temperature

FINAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1						20.0		20.0		20.0		19.0		
2						20.0		20.0		20.0		19.0		
3						20.0		20.0		20.0		19.0		
4						20.0		20.0		20.0		190		
5						20.0		20.0		20.0		19.0		
6						20.0		20.0		20.0		19.0		
7						20.0		20.0		20.0		19.0		
8						20.0		20.0		20.0		19.0		
9				TD		20.0	TD	20.0	TD	20.0	TD	19.0		
10						20.0		20.0		20.0		19.0	TD	
11						20.0		20.0		20.0		19.0		
12						20.0		20.0		20.0		19.0		
13						20.0		20.0		20.0		19.0		
14						20.0		20.0		20.0		19.0		
15						20.0		200		20.0		19.0		
16						20.0		200		20.0		19.0		
17						20.0		20.0		20.0		19.0		
18						20.0		20.0		20.0		19.0		
Initials						MTH		MTH		MTH		MTH		
Date						5/28		5/30		6/1		6/3		

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston
JOB #: 95-177

TEST START DATE: 5-26-95
ORGANISM LOG #: 95-0056
PARAMETER: D.O.

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		6.1	7.8	7.9	7.9	6.2	7.4	7.1	7.0	6.9	7.03	7.3	7.6	7.5
2		6.3	7.8	7.8	7.9	6.6	7.4	7.1	7.0	7.0	7.03	7.3	7.6	7.4
3		6.3	7.8	7.9	7.9	7.0	7.4	7.1	7.2	7.0	7.3	7.3	7.6	7.5
4		6.2	7.7	7.8	7.9	6.8	7.4	7.2	7.2	7.1	7.3	7.3	7.6	7.5
5		6.3	7.7	7.9	7.9	7.0	7.4	7.0	7.3	7.2	7.3	7.3	7.6	7.5
6		6.1	7.8	7.8	7.9	6.8	7.4	7.1	7.2	7.2	7.3	7.3	7.6	7.5
7		6.3	7.8	7.8	7.9	7.0	7.4	7.1	7.3	7.3	7.4	7.3	7.6	7.4
8		6.3	7.8	8.0	7.9	7.1	7.4	7.3	7.4	7.4	7.3	7.3	7.6	7.5
9		6.2	7.8	8.0	7.9	7.2	7.4	7.4	7.4	7.4	7.5	7.3	7.6	7.4
10		6.2	7.7	7.9	7.9	7.0	7.4	7.4	7.4	7.3	7.5	7.3	7.6	7.5
11		6.3	7.8	8.0	7.9	7.2	7.4	7.4	7.5	7.3	7.4	7.3	7.6	7.5
12		6.3	7.8	7.0	7.9	6.7	7.4	7.3	7.2	7.2	7.4	7.3	7.6	7.4
13		6.3	7.8	8.0	7.9	7.2	7.4	7.5	7.6	7.5	7.4	7.3	7.6	7.4
14		6.3	7.8	8.0	7.9	6.8	7.4	7.4	7.5	7.4	7.3	7.3	7.6	7.5
15		6.2	7.8	7.7	7.9	7.0	7.4	7.4	7.6	7.3	7.4	7.3	7.6	7.5
16		6.3	7.8	7.8	7.9	6.9	7.4	7.4	7.5	7.4	7.4	7.4	7.6	7.4
17		6.3	7.7	7.9	7.9	7.0	7.4	7.4	7.5	7.4	7.4	7.3	7.6	7.5
18		6.2	7.8	8.0	7.9	7.0	7.4	7.4	7.5	7.5	7.4	7.3	7.6	7.5
Initials		MTH	MTH	MTH	[illegible]	AMD	MTH AMD	MTH NMD	MTH ES	MTH ES	~~MTH~~ CLE	MTH	MTH	MTH
Date		5/26	5/26	5/26	5/27	5/28	5/29	5/30	5/31	6/1	6/2	6/3	6/4	6/5

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston **TEST START DATE:** 5-26-95 **PARAMETER:** D.O.
JOB #: 95-177 **ORGANISM LOG #:** 95-0056

FINAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1						8.0		7.0		7.1		7.1		
2						8.0		7.0		7.0		7.1		
3						8.0		7.0		7.2		7.1		
4						79		7.0		7.2		7.1		
5						8.0		7.0		7.2		7.1		
6						8.0		7.0		7.2		7.1		
7						8.0		7.0		7.3		7.1		
8						8.0		7.0		7.3		7.1		
9						8.0		7.0		7.2		7.1		
10						8.0		7.0		7.2		7.1		
11						8.0		7.0		7.2		7.1		
12						8.0		7.0		7.3		7.1		
13						8.0		7.0		7.2		7.1		
14						8.0		7.0		7.2		7.1		
15						8.0		7.0		7.3		7.1		
16						7.9		7.0		7.3		7.1		
17						8.0		7.0		7.3		7.1		
18						8.0		7.0		7.3		7.1		
Initials						MTH		MTH TKE		MTH		MTH		
Date						5/28		5/30		6/1		6/3		

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston
JOB #: 95-177

TEST START DATE: 5-26-95
ORGANISM LOG #: 95-0056

PARAMETER: pH

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		7.3	7.1	7.6	7.8	7.8	7.9	7.9	7.8	8.0	8.1	8.2	8.2	8.1
2		7.4	7.2	7.6	7.8	8.0	8.0	8.0	7.9	8.0	8.1	8.1	8.2	8.0
3		7.3	7.2	7.7	7.8	8.0	8.0	8.0	7.9	8.0	8.1	8.1	8.2	8.0
4		7.3	7.2	7.8	7.9	8.1	8.1	8.0	7.9	8.0	8.2	8.1	8.2	8.1
5		7.3	7.2	7.9	7.9	8.0	8.1	8.0	7.9	7.9	8.1	8.1	8.2	8.1
6		7.3	7.3	8.0	7.9	8.0	8.1	8.0	7.9	8.0	8.1	8.1	8.2	8.0
7		7.3	7.3	7.9	7.9	7.9	8.1	8.0	7.9	7.9	8.1	8.1	8.2	8.0
8		7.3	7.2	8.0	7.9	8.0	8.1	8.0	7.9	8.0	8.1	8.1	8.2	8.1
9		7.3	7.3	7.9	7.9	8.0	8.1	8.1	7.9	7.8	8.0	8.2	8.2	8.0
10		7.3	7.3	8.0	7.9	8.1	8.2	8.1	8.0	8.3	8.5	8.4	8.2	8.5
11		7.3	7.3	8.0	7.9	8.1	8.2	8.2	8.0	7.9	8.2	8.2	8.2	8.1
12		7.4	7.3	7.9	7.9	8.0	8.2	8.2	8.1	8.2	8.5	8.4	8.2	8.6
13		7.3	7.3	8.1	7.9	8.1	8.2	8.2	8.0	7.9	8.1	8.2	8.2	8.0
14		7.3	7.3	8.0	7.9	8.0	8.1	8.2	8.0	7.9	8.1	8.2	8.2	8.0
15		7.4	7.3	8.0	7.9	8.2	8.2	8.1	8.1	8.3	8.5	8.4	8.2	8.5
16		7.4	7.3	8.1	8.0	8.0	8.1	8.2	8.1	7.8	8.1	8.1	8.2	8.0
17		7.3	7.4	8.1	8.0	8.0	8.1	8.1	8.0	7.9	8.1	8.1	8.2	8.0
18		7.3	7.3	8.1	7.9	8.1	8.2	8.1	8.0	8.0	8.2	8.2	8.2	8.1
Initials		MTH	MTH	MTH	NAU	AMD	MTH AMD	MTH NMH	ES MTH	ES MTH	MTH CLE	MTH	MTH	MTH
Date		5-26	5-26	5-26	5/27	5/28	5/29	5/30	5/31	6/1	6/2	6/3	6/4	6/5

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston
JOB #: 95-177

TEST START DATE: 5-26-95 PARAMETER: pH
ORGANISM LOG #: 95-0056

FINAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1						7.9		8.0		8.4		7.8		
2						7.9		8.0		8.4		7.8		
3						8.0		8.0		8.4		7.8		
4						8.0		8.0		8.4		7.8		
5						8.0		8.0		8.4		7.8		
6						8.0		8.0		8.4		7.8		
7				NA		7.9	NA	8.0	NA	8.4	NA	7.8	NA	
8						8.0		8.0		8.4		7.8		
9						8.0		8.0		8.4		7.8		
10						8.0		8.0		8.4		7.8		
11						8.0		8.0		8.4		7.8		
12						8.0		8.0		8.4		7.8		
13						8.0		8.0		8.4		7.8		
14						7.9		8.0		8.4		7.8		
15						8.0		8.0		8.4		7.8		
16						8.0		8.0		8.4		7.8		
17						8.0		8.0		8.4		7.8		
18						8.0		8.0		8.4		7.8		
Initials						MTH		MTH		MTH		MTH		
Date						5/28		5/30		6/1		6/3		

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston TEST START DATE: 5-26-95 PARAMETER: Salinity
JOB #: 95-177 ORGANISM LOG #: 95-0056

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days	5 days
1		21.5	21.5	20.5	21.0	21.0	21.0	21.0	19.5	22.0	22.0	22.0	22.0	22.5	22.0
2		21.5	21.5	21.5	21.0	22.0	21.5	22.0	19.5	22.5	22.0	22.0	22.0	22.5	22.0
3		21.5	21.5	21.5	21.0	22.0	22.0	22.0	19.5	22.5	22.0	22.0	22.0	23.0	22.0
4		21.5	21.5	21.5	21.0	22.0	22.0	22.0	19.5	23.0	22.0	22.0	22.0	22.5	22.0
5		21.5	21.5	20.5	21.0	22.0	22.0	22.0	19.5	22.5	22.0	22.0	23.0	22.5	22.0
6		21.5	21.5	21.0	21.0	22.0	22.0	21.5	19.5	22.0	22.0	22.0	22.0	22.5	22.0
7		21.5	21.5	20.5	21.0	22.0	22.0	22.0	19.5	22.5	22.0	22.0	23.0	22.5	22.0
8		21.5	21.5	21.5	21.0	22.0	22.0	22.0	19.5	22.5	22.0	22.0	23.0	22.5	22.0
9		21.5	21.5	21.5	21.0	22.0	22.0	22.0	19.5	22.0	22.0	22.0	22.0	22.5	22.0
10		21.5	21.5	22.0	21.5	23.0	21.0	22.5	19.5	23.0	22.0	22.0	23.0	22.5	22.0
11		21.5	21.5	21.0	21.0	21.0	22.0	21.0	19.5	22.0	22.0	22.0	22.0	22.5	22.0
12		21.5	21.5	22.0	21.5	23.0	22.0	22.5	19.5	22.5	22.0	22.0	23.0	22.5	22.0
13		21.5	21.5	20.5	21.0	21.0	22.0	21.0	19.5	21.5	22.0	22.0	23.0	22.5	22.
14		21.5	21.5	20.5	21.0	22.0	22.0	21.5	19.5	22.0	22.0	22.0	23.0	22.5	22.0
15		21.5	21.5	22.0	21.0	23.0	22.0	22.0	19.5	22.5	22.0	22.0	22.0	22.5	22.0
16		21.5	21.5	21.5	21.0	22.5	22.0	21.5	19.5	22.0	22.0	22.0	23.0	22.5	22.0
17		21.5	21.5	21.5	21.0	22.0	21.5	21.5	19.5	22.0	22.0	22.0	23.0	22.5	22.0
18		21.5	21.5	21.0	21.0	22.0	21.5	21.5	19.5	22.0	22.0	22.0	23.0	22.0	22.0
Initials		MTH	MTH	MTH	NMH	AMD	MTH AMD	MTH NMH	ES MTH	ES MTH	MTH CLE	MTH	MTH	MTH	ES MTH
Date		5-26	5-26	5-26	5-27	5-28	5/29	5/30	5/31	6/1	6/2	6/3	6/4	6/5	5/31

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston
JOB #: 95-177

TEST START DATE: 5-26-95
ORGANISM LOG #: 95-0056
PARAMETER: Salinity

FINAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1						22.0		22.0		21.5		21.0		
2						22.0		22.0		22.0		21.0		
3						22.0		22.0		22.0		21.0		
4						22.0		22.0		22.0		21.0		
5						22.0		22.0		22.0		21.0		
6						22.0		22.0		22.0		21.0		
7						22.0		22.0		22.0		21.0		
8						22.0		22.0		22.0		21.0		
9						22.0		22.0		22.0		21.0		
10						22.0		22.0		22.0		21.0		
11						22.0		22.0		22.0		21.0		
12						22.0		22.0		22.0		21.0		
13						22.0		22.0		22.0		21.0		
14						22.0		22.0		22.0		21.0		
15						22.0		22.0		22.0		21.0		
16						22.0		22.0		22.0		21.0		
17						22.0		22.0		22.0		21.0		
18						22.0		22.0		22.0		21.0		
Initials						MTH		MTH		MTH		MTH		
Date						5/28		5/30		6/1		6/3		

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston   TEST START DATE: 5-26-95   PARAMETER: Observations
JOB #: 95-177   ORGANISM LOG #: 95-0056

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		N	N	N	N	N	N	N	N	N	N	N	N	N
2		N	N	N	N	N	N	N	N	N	N	N	N	N
3		N	N	N	N	N	N	N	N	N	N	N	N	N
4		N	N	N	N	N	N	N	N	N	N	N	N	N
5		N	N	N	N	N	N	N	N	N	N	N	N	N
6		N	N	N	N	N	N	N	N	N	N	N	N	N
7		N	N	N	N	N	N	N	N	N	N	N	N	N
8		N	N	N	N	N	N	N	N	N	N	N	N	N
9		N	N	N	N	N	N	N	N	N	N	N	N	N
10		N	N	N	N	N	N	N	N	N	N	N	N	N
11		N	N	N	N	N	N	N	N	N	N	N	N	N
12		N	N	N	N	N	N	N	N	N	N	N	N	N
13		N	N	N	N	N	N	N	N	N	N	N	N	N
14		N	N	N	N	N	N	N	N	N	N	N	N	N
15		N	N	N	N	N	N	N	N	N	N	N	N	N
16		N	N	N	N	N	N	N	N	N	N	N	N	N
17		N	N	N	N	N	N	N	N	N	N	N	N	N
18		N	N	N	N	N	N	N	N	N	N	N	N	N
Initials		MTH	MTH	MTH	NAH	AMD	MTH AMD	MTH NAH	MTH ES	MTH ES	MTH CCE	MTH	MTH	MTH
Date		5/26	5/26	5/26	5/27	5/28	5/29	5/30	5/31	6/1	6/2	6/3	6/4	6/5

Caution. be careful that air tubing does not pinch and cause air to stop.

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston TEST START DATE: 5-26-95 PARAMETER: Feeding
JOB #: 95-177 ORGANISM LOG #: 95-0056

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		✓			✓		✓		✓		✓		✓	
2		✓			✓		✓		✓		✓		✓	
3		✓			✓		✓		✓		✓		✓	
4		✓			✓		✓		✓		✓		✓	
5		✓			✓		✓		✓		✓		✓	
6		✓			✓		✓		✓		✓		✓	
7		✓			✓		✓		✓		✓		✓	
8		✓			✓		✓		✓		✓		✓	
9		✓			✓		✓		✓		✓		✓	
10		✓			✓		✓		✓		✓		✓	
11		✓			✓		✓		✓		✓		✓	
12		✓			✓		✓		✓		✓		✓	
13		✓			✓		✓		✓		✓		✓	
14		✓			✓		✓		✓		✓		✓	
15		✓			✓		✓		✓		✓		✓	
16		✓			✓		✓		✓		✓		✓	
17		✓			✓		✓		✓		✓		✓	
18		✓			✓		✓		✓		✓		✓	
Initials		MTH			MTH		MTH		MTH		MTH		MTH	
Date		5-26			5-27		5-29		5-31		6/2		6/4	

CULTURE LAB RECEIVING FORM

RECEIVING LOG #: 95-0056
DATE: 5/19/95

SHIPPING CARRIER: Fed Ex.
CARRIER LOG #: 4785709401

SPECIES: L. plumulosus
NUMBER SHIPPED:

LIVESTOCK SOURCE/SHIPPER: East Coast Amphipod

SHIPPER INVOICE #: Void
PACKER'S NAME: C.M.

ASI ORDER REF. DATE: 5/17/95
ASI REF INITIALS: EL

AGE/SIZE CHARACTERISTICS: 2-4mm

TAXONOMIC CERTIF. BY:
DATE:

RECEIVING/WATER QUALITY PARAMETERS:

D.O.: Sat
TEMP: 11.0°C
NH_3/NO_2: 0/0

SALINITY/~~HARDNESS~~: 14.0ppt
ALK: 56
pH: 7.3

WATER (CLEAR/CLOUDY)
CONTAINER SIZE/NUMBER: 1l jar 12

OF BLUE ICE: 2
TYPE OF PACKING: Styrofoam box

OBSERVATION/CONDITION OF LIVESTOCK: Appear healthy

RECEIVING TECH. INT.: CD
SUPERVISOR'S INITIALT: CD

East Coast Amphipod
Field Collection Data Sheet

Collection Date: 5/8/95

Time: 8:30 AM

Field Temperature:

Water: 14 °C Air: 15 °C

Physical Data: Sample enclosed

Animal Collected: *L. plumulosus*

Number Collected: 600 Sediment Provided: Yes No

Jar Number	No. of Amphipods	Amphipod Size		Sediment
1	300	<1.7mm >1.0mm		
		<1.0mm >.71mm	X	
2	300	<1.7mm >1.0mm		
		<1.0mm >.71mm	X	
3		<1.7mm >1.0mm		
		<1.0mm >.71mm		
4		<1.7mm >1.0mm		
		<1.0mm >.71mm		
5		<1.7mm >1.0mm		
		<1.0mm >.71mm		
6		<1.7mm >1.0mm		
		<1.0mm >.71mm		
7		<1.7mm >1.0mm		
		<1.0mm >.71mm		
8		<1.7mm >1.0mm		
		<1.0mm >.71mm		
9		<1.7mm >1.0mm		
		<1.0mm >.71mm		
10		<1.7mm >1.0mm		
		<1.0mm >.71mm		

Location Narrow River

Animals shipped in water

Collected By: [signature]

Christopher M. McManus

Comments

L.p. shipped in collection site water.

AQUA SURVEY, INC.

CULTURE LAB ACCLIMATIZATION FORM

Acclimatization

[ ] NO ACCLIMATIZATION REQUIRED
[ ] TEMP. ACCLIMATIZATION
[X] WATER ACCLIMATIZATION

JOB #: ____________ TEST SPECIES: L. plumulosus

ACCLIMATIZATION INITIAL PARAMETERS

TEMP: 22.0°C SALINITY: 25.0 ppt TYPE OF WATER: Manasquan

ACCLIMATIZATION TARGET PARAMETERS

TEMP: 22.0°C SALINITY: 23.0 ppt TYPE OF WATER: Manasquan

ACCLIMATIZATION CHAMBER VOLUME (LITERS): 38 l tank

ACCLIMATIZATION LOCATION: Culture Annex Room

ACCLIMATIZATION WATER TYPE: Manasquan

ACCLIMATIZATION WATER TEMP.: 22.0°C

ACCLIMATIZATION COMMENCEMENT - DATE/TIME: 5/24/95 / 0900 hrs

CHANGE OVER RATE (APPROX. mL/MINUTE): 10-20 ml/min

ACCLIMATIZATION CONCLUSION - DATE/TIME: 5/26/95 / 1030 hrs

TECHNICIAN INITIALS/COMMENCEMENT: CD

TECHNICIAN INITIALS/CONCLUSION: CD

SUPERVISOR INITIALS: CD

REMARKS: ____________

AQUA SURVEY, INC.
CULTURE LABORATORY

15 DAY - GENERAL SPECIES STATUS LOG

SPECIES: L. plumulosus DATES: 5/19/95

RECEIVING [X] CULTURE [ ] LOG #: 95-0056 INITIAL STOCK @: 600+

TEST JOB #: ______ CLIENT: ______ FOOD TYPE: ______

		Temp/DO	NH_3/NO_2	pH	Sal/~~Hard~~	Alkalinity	Mortality	Remarks/Initials
5/19	Day 1	11.0°C/Sat	0/0	7.3	14.0 ppt	56	Ø	Acclimation started CI
5/20	Day 2	14.5°C/8.8	0/0	7.4	18.0 ppt	72	Ø	Acclimation continued Moved to Algae Lab CI
5/21	Day 3	19.0°C/7.8	0/0	8.1	21.0 ppt	88	Ø	Acclimation continued Moved to Amph. Lab CI
5/22	Day 4	22.0°C/6.8	0/0	8.1	24.5 ppt	104	Ø	Acclimation concluded CI
5/23	Day 5	22.0°C/6.7	0/0	8.2	25.0 ppt	112	Ø	CI
5/24	Day 6	22.0°C/7.0	0/0	8.0	25.0 ppt	100	Ø	Acclimation to 22 ppt started (for to SCT) CI
5/25	Day 7	23.0°C/7.1	0/0	8.1	23.0 ppt	80	Ø	Acclimation concluded CI
5/26	Day 8	22.5°C/7.5	0/0	8.1	22.0 ppt	84	Ø	To Test 300+ CI
	Day 9							
	Day 10							
	Day 11							
	Day 12							
	Day 13							
	Day 14							
	Day 15							

A-16

AQUA SURVEY, INC.

CULTURE LAB DISTRIBUTION FORM

DATE: 5/26/95

TEST JOB #: ____________ CLIENT: Weston

TEST LOCATION: IN-LAB [✓] FIELD [ ]

TEST SPECIES: L. plumulosus

TOTAL NUMBER OF ORGANISMS TRANSFERRED: 300+

AQUA SURVEY, INC. CULTURE LAB INVESTIGATORS: CD

A. ORGANISMS

1. ASI CULTURE/HOLDING UNIT: 38 l tank 95-0412
2. RECEIVING LOG #: 95-0056 East Coast Amphipod
3. CULTURE LOT #: 0011
4. AGE/SIZE INFORMATION: 2-4 mm long

B. HOLDING [X] CULTURE [ ] WATER PARAMETERS

1. TEMPERATURE: 22.5 °C
2. SALINITY: 22.0 ppt
3. WATER SOURCE: Manasquan

C. TRANSFER CUSTODY & TRANSFER

1. LIVESTOCK RELINQUISHMENT DATE: 5/26/95 TIME: 1000 BY: CD
2. LIVESTOCK RECEIVING DATE: 5/26/95 TIME: 1000 BY: MTH
3. CULTURE SUPERVISOR OR LEAD CULTURIST INITIALS: CD

REMARKS: ____________

Homogeneity of Variance

Response assrpsur
Factors trtment
ConfLvl 95.0000

Bonferroni confidence intervals for standard deviations

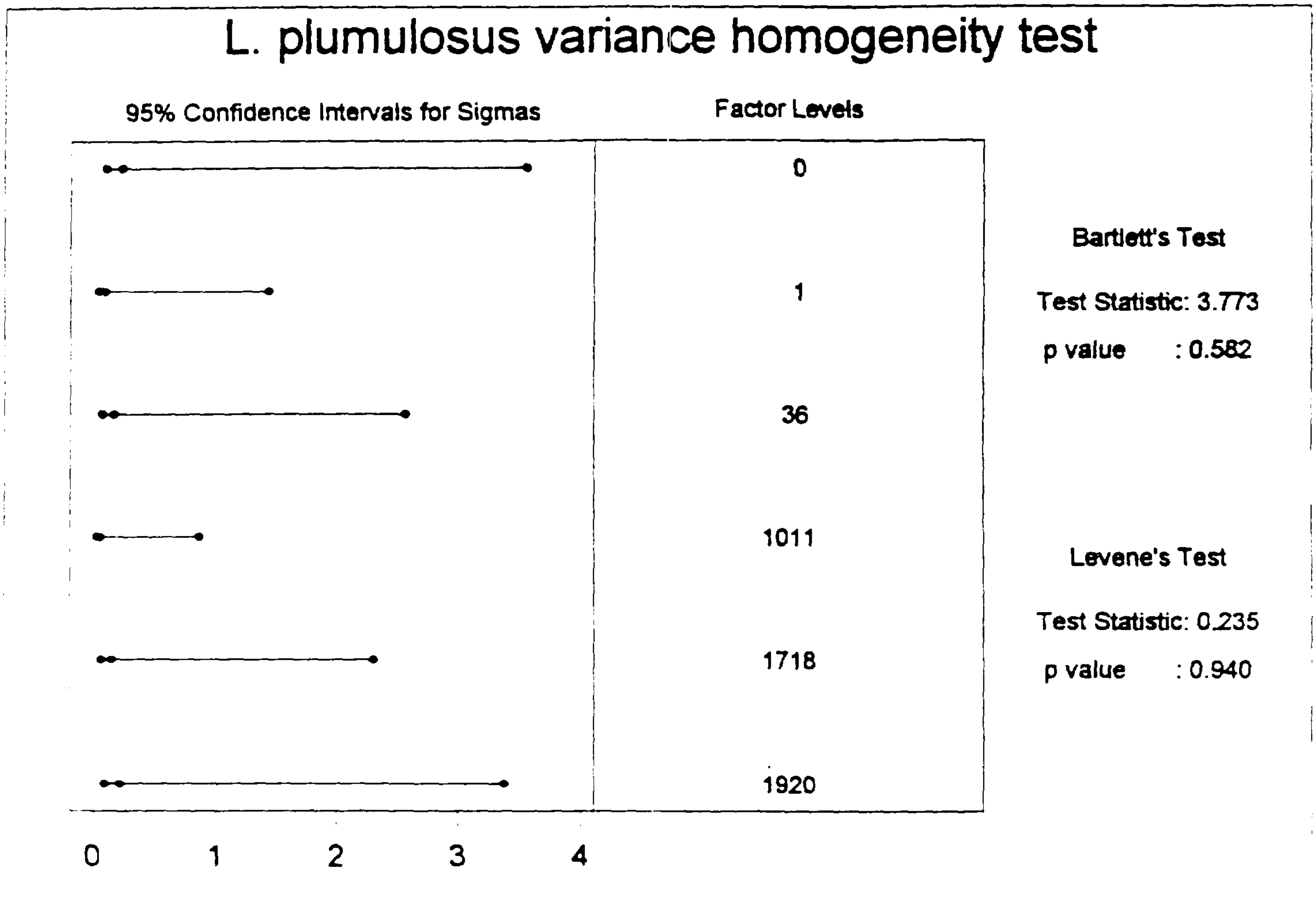
Lower	Sigma	Upper	n	Factor Levels
9.81E-02	0.229612	3.55342	3	0
3.93E-02	0.092110	1.42548	3	1
7.08E-02	0.165711	2.56450	3	36
2.37E-02	0.055563	0.85987	3	1011
6.36E-02	0.148892	2.30422	3	1718
9.32E-02	0.218252	3.37763	3	1920

Bartlett's Test (normal distribution)

Test Statistic: 3.773
p value : 0.582

Levene's Test (any continuous distribution)

Test Statistic: 0.235
p value : 0.940


L. plumulosus variance homogeneity test
95% Confidence Intervals for Sigmas
Factor Levels
0
1
36
1011
1718
1920
0
1
2
3
4
Bartlett's Test
Test Statistic: 3.773
p value : 0.582
Levene's Test
Test Statistic: 0.235
p value : 0.940

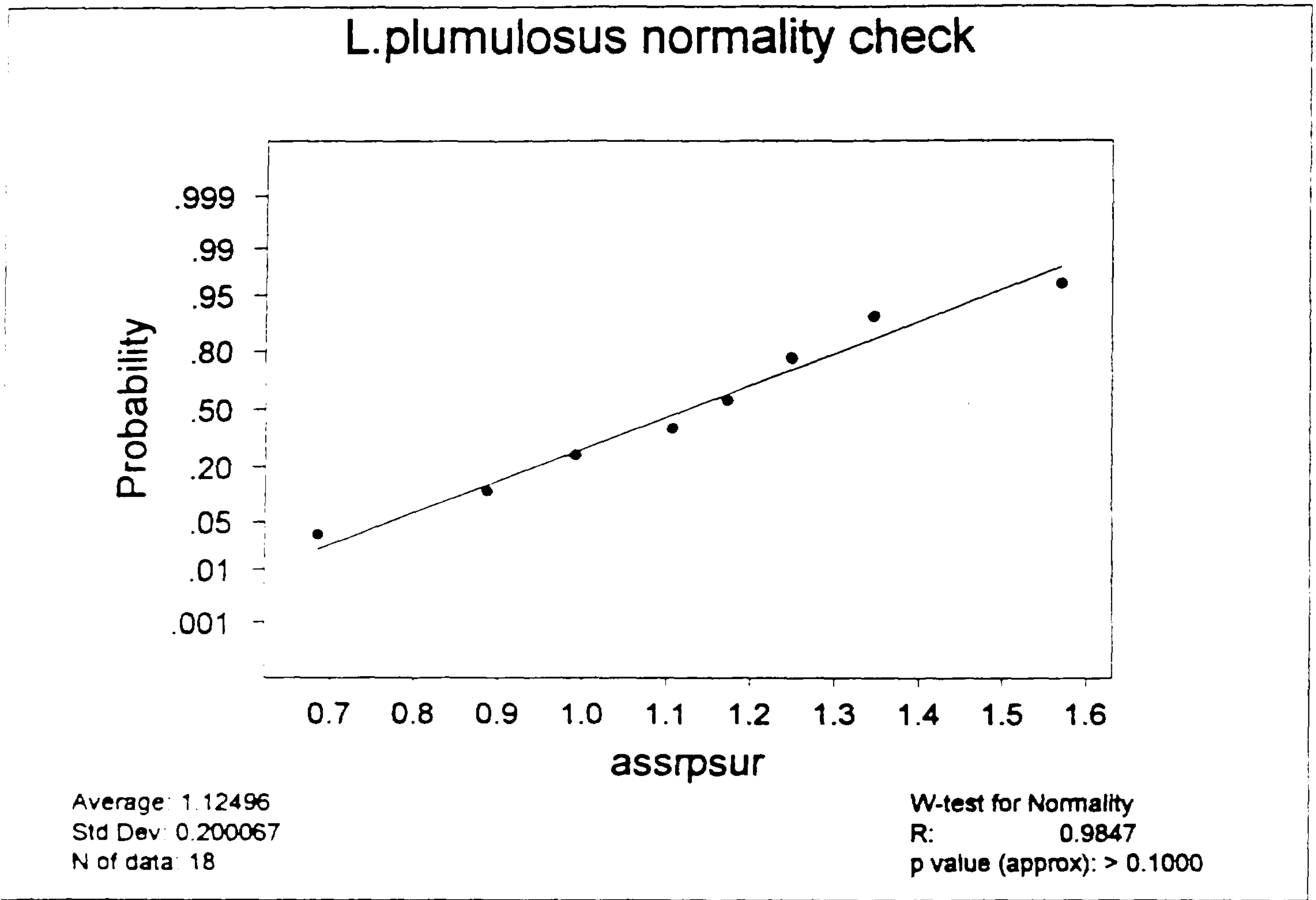
One-Way Analysis of Variance

```
Analysis of Variance on assrpsur
Source     DF        SS          MS          F        p
trtment     5    0.3573      0.0715       2.65    0.077
Error      12    0.3231      0.0269
Total      17    0.6805
                                       Individual 95% CIs For Mean
                                       Based on Pooled StDev
Level       N      Mean       StDev  --+---------+---------+---------+----
    0       3    1.3057      0.2296                   (-------*-------)
    1       3    1.0905      0.0921           (--------*-------)
   36       3    0.9818      0.1657       (-------*--------)
 1011       3    1.2811      0.0556                  (-------*--------)
 1718       3    1.1631      0.1489              (--------*-------)
 1920       3    0.9277      0.2183    (-------*-------)
                                     --+---------+---------+---------+----
Pooled StDev =   0.1641                0.75      1.00      1.25      1.50

Dunnett's intervals for treatment mean minus control mean

    Family error rate = 0.0500
Individual error rate = 0.0133

Critical value = 2.90

Control = level 0 of trtment

Level      Lower      Center       Upper  ------+---------+---------+---------+-----
    1    -0.6037     -0.2152      0.1733       (------------*------------)
   36    -0.7125     -0.3239      0.0646   (------------*------------)
 1011    -0.4131     -0.0245      0.3640             (------------*------------)
 1718    -0.5311     -0.1426      0.2460         (------------*------------)
 1920    -0.7665     -0.3780      0.0106  (------------*------------)
                                          ------+---------+---------+---------+-----
                                              -0.60     -0.30     -0.00      0.30
```

Descriptive Statistics

Variable	trtment	N	Mean	Median	TrMean	StDev	SEMean
propsurv	0	3	0.9000	0.8500	0.9000	0.0866	0.0500
	1	3	0.7833	0.8000	0.7833	0.0764	0.0441
	36	3	0.6833	0.6000	0.6833	0.1443	0.0833
	1011	3	0.9167	0.9000	0.9167	0.0289	0.0167
	1718	3	0.8333	0.9000	0.8333	0.1155	0.0667
	1920	3	0.633	0.700	0.633	0.208	0.120

Variable	trtment	Min	Max	Q1	Q3
propsurv	0	0.8500	1.0000	0.8500	1.0000
	1	0.7000	0.8500	0.7000	0.8500
	36	0.6000	0.8500	0.6000	0.8500
	1011	0.9000	0.9500	0.9000	0.9500
	1718	0.7000	0.9000	0.7000	0.9000
	1920	0.400	0.800	0.400	0.800


L.plumulosus normality check
Probability
.999
.99
.95
.80
.50
.20
.05
.01
.001
0.7
0.8
0.9
1.0
1.1
1.2
1.3
1.4
1.5
1.6
assrpsur
Average: 1.12496
Std Dev: 0.200067
N of data: 18
W-test for Normality
R: 0.9847
p value (approx): > 0.1000

SAMPLE ID: SRt L. plumulosus 5/24/96 CdCl2 CdCl2

CONCENTRATION	NUMBER EXPOSED	NUMBER AFFECTED	PERCENT AFFECTED	BINOMIAL PROBABILITY (%)
3.2000	30	29	96.6666600	0.0000029
1.8000	30	22	73.3333400	0.8062400
1.0000	30	17	56.6666700	29.2332400
0.5500	30	10	33.3333400	4.9368570
0.3000	30	5	16.6666700	0.0162457

------------------------------ RESULTS ------------------------------------

METHOD	SPAN	G	EC50	95 PERCENT CONFIDENCE LIMITS
BINOMIAL			0.844552	0.300000 - 1.800000
MOVING AVERAGE	4	0.074173	0.849457	0.667939 - 1.051917
PROBIT		0.085333	0.824234	0.647761 - 1.029213

INTERPRETATION OF STATISTICS

The order of preference of results is:
BEST: Probit Method
BETTER: Moving Average
GOOD: Binomial
GOOD: Graphic Interpolation (Graph drawn by hand)
assuming all are statistically valid.

To Determine if a method has given valid results:
GRAPHICAL: Always valid
BINOMIAL: The program will tell you if this is not valid.
MOVING AVERAGE: The number of spans needs to be no less than one lower than the number of concentrations tested (excluding control).
PROBIT: The program will tell you if this is not valid

96 HOUR REFERENCE TOXICANT TEST

CLIENT: Weston TOXICANT: $CdCl_2$ SPECIES: [illegible] TEST WATER: 25ppt [illegible] TEST VOL: 250 ml

TEST TEMP.: 20 ± 2 START DATE: 5-24 END DATE: 5/28/95 START TIME: ______ END TIME: ______

SAMPLE CONC.	LIVE COUNT					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
Control A	10	10	10	10	9	7.2	7.9	7.7	7.9	8.1	25.0	25.5	25.0	25.0	~~23.0~~ 25.0
Control B	10	10	10	10	10	7.2	7.9	7.7	7.9	8.1	25.0	25.5	25.0	25.0	~~23.0~~ 25.0
Control C	10	10	10	9	8^1	7.2	7.9	7.7	7.9	8.1	25.0	25.5	25.0	25.0	~~23.0~~ 25.0
0.30 A	10	10	10	9	8^1	7.2	7.9	7.7	7.9	8.1	25.0	25.5	25.0	25.0	25.0
0.30 B	10	10	10	10	9^1	7.2	7.9	7.7	7.9	8.1	25.0	25.5	25.0	25.0	25.0
0.30 C	10	10	10	10	8^2	7.2	7.9	7.9	7.9	8.1	25.0	25.5	25.0	25.0	25.0
0.55 A	10	10	10	10	8^1	7.2	7.9	7.7	7.9	8.1	25.0	25.5	25.0	25.0	25.0
0.55 B	10	10	9^1	9	6^2	7.2	8.0	7.8	7.9	8.1	25.0	25.5	25.0	25.0	25.0
0.55 C	10	10	9^1	9	6^2	7.2	7.9	7.8	7.9	8.1	25.0	25.5	25.0	25.0	25.0
1.0 A	10	10	9^1	9	3^6	7.2	7.9	7.8	7.9	8.1	25.0	25.5	25.0	25.0	25.0
1.0 B	10	10	9^1	9	6^2	7.2	7.9	7.8	7.8	8.1	25.0	25.5	25.0	25.0	25.0
1.0 C	10	10	7^3	7	4^3	7.2	7.9	7.8	7.9	8.1	25.0	25.5	25.0	25.0	25.0
1.8 A	10	10	9^1	9	5^4	7.2	7.9	7.7	7.9	8.1	25.0	25.5	25.0	25.0	25.0
1.8 B	10	10	7^3	6^1	1^5	7.2	7.9	7.7	7.9	8.1	25.0	25.5	25.0	25.0	25.0
1.8 C	10	9^1	9	9	3^6	7.2	7.9	7.7	7.9	8.1	25.0	25.5	25.0	25.0	25.0
3.2 A	10	9^1	5^4	5	0^5	7.2	7.9	7.8	7.9	8.1	25.0	25.5	25.0	25.0	25.0
3.2 B	10	10	7^3	6^1	0^6	7.8	7.9	7.8	7.9	8.1	25.0	25.5	25.0	25.0	25.0
3.2 C	10	10	6^4	5^1	1^4	7.8	7.9	7.8	7.9	8.1	25.0	25.5	25.0	25.0	25.0
Date/Initials	5-23 MTH	5-25 MTH	5-26 MTH		5-28 AMO	5-23 MTH	5-25 MTH	5-26 MTH		5-28 AMO	5-23 MTH	5-25 MTH	5-26 MTH	5	5/28 AMO

w.o km

SAMPLE CONC.	TEMPERATURE					DISSOLVED OXYGEN (mg/L)				
	00	24	48	72	96	00	24	48	72	96
Control A	20.0	19.0	19.0	19.5	19.5	8.2	8.2	8.0	9.0	7.2
Control B	20.0	19.0	19.0	19.5	19.5	8.2	8.3	8.1	9.0	7.2
Control C	20.0	19.0	19.0	19.5	19.5	8.2	8.3	8.1	9.0	7.3
0.30 A	20.0	19.0	19.0	19.5	19.5	8.2	8.3	8.0	9.1	7.4
0.30 B	20.0	19.5	19.0	19.5	19.5	8.2	8.2	8.0	9.0	7.3
0.30 C	20.0	19.0	19.0	19.5	19.5	8.2	8.2	8.0	9.1	7.4
0.55 A	20.0	19.0	19.0	19.5	19.5	8.2	8.2	8.0	9.1	7.4
0.55 B	20.0	19.0	19.0	19.5	19.5	8.2	8.2	8.0	9.1	7.3
0.55 C	20.0	19.0	19.0	19.5	19.5	8.2	8.2	8.0	9.1	7.4
1.0 A	20.0	19.0	19.0	19.5	19.5	8.2	8.3	8.0	9.1	7.2
1.0 B	20.0	19.0	19.0	19.5	19.5	8.2	8.3	8.0	9.1	7.3
1.0 C	20.0	19.0	19.0	19.5	19.5	8.2	8.3	8.0	9.1	7.3
1.8 A	20.0	19.0	19.0	19.5	19.5	8.2	8.3	8.1	9.1	7.4
1.8 B	20.0	19.0	19.0	19.5	19.5	8.2	8.2	8.0	9.0	7.4
1.8 C	20.0	19.0	19.0	19.5	19.5	8.2	8.3	8.1	9.0	7.4
3.2 A	20.0	19.0	19.0	19.5	19.5	8.2	8.3	8.0	9.1	7.4
3.2 B	20.0	19.0	19.0	19.5	19.5	8.2	8.2	8.0	9.1	7.3
3.2 C	20.0	19.0	19.0	19.5	19.5	8.2	8.3	8.0	9.1	7.4
Date/Initials	5-23 MTH	5-25 MTH	5-26 MTH		5-28 AMO	5-23 MTH	5-25 MTH	5-26 MTH		AMO 5/28

Notes & Observations:

AQUA SURVEY, INC.

CULTURE LAB RECEIVING FORM

RECEIVING LOG #: 95-0056

DATE: 5/19/95

SHIPPING CARRIER: Fed Ex.

CARRIER LOG #: 478570940/

SPECIES: L. plumulosus

NUMBER SHIPPED: ______

LIVESTOCK SOURCE/SHIPPER: East Coast Amphipod

SHIPPER INVOICE #: Void

PACKER'S NAME: C.M.

ASI ORDER REF. DATE: 5/17/95

ASI REF INITIALS: EL

AGE/SIZE CHARACTERISTICS: 2-4mm

TAXONOMIC CERTIF. BY: ______

DATE: ______

RECEIVING/WATER QUALITY PARAMETERS:

D.O.: Sat

TEMP: 11.0°C

NH_3/NO_2: 0/0

SALINITY/~~HARDNESS~~: 14.0ppt

ALK: 56

pH: 7.3

WATER (CLEAR/CLOUDY)

CONTAINER SIZE/NUMBER: 1l jug 12

OF BLUE ICE: 2

TYPE OF PACKING: Styrofoam box

OBSERVATION/CONDITION OF LIVESTOCK: Appear healthy

RECEIVING TECH INT.: CI

SUPERVISOR'S INITIALT: CI

East Coast Amphipod
Field Collection Data Sheet

Collection Date: 5/8/95

Time: 8:30 AM

Field Temperature:

Water: 14 °C Air: 15 °C

Physical Data: Sample enclosed

Animal Collected: *L. plumulosus*

Number Collected: 600 Sediment Provided: Yes No

Jar Number	No. of Amphipods	Amphipod Size		Sediment
1	300	<1.7mm >1.0mm		
		<1.0mm >.71mm	X	
2	300	<1.7mm >1.0mm		
		<1.0mm >.71mm	X	
3		<1.7mm >1.0mm		
		<1.0mm >.71mm		
4		<1.7mm >1.0mm		
		<1.0mm >.71mm		
5		<1.7mm >1.0mm		
		<1.0mm >.71mm		
6		<1.7mm >1.0mm		
		<1.0mm >.71mm		
7		<1.7mm >1.0mm		
		<1.0mm >.71mm		
8		<1.7mm >1.0mm		
		<1.0mm >.71mm		
9		<1.7mm >1.0mm		
		<1.0mm >.71mm		
10		<1.7mm >1.0mm		
		<1.0mm >.71mm		

Location: Narrow River

Animals shipped in water

Collected By:

Christopher M. McManus

Comments:

L.p. shipped in collection site water.

AQUA SURVEY, INC.
CULTURE LABORATORY

15 DAY - GENERAL SPECIES STATUS LOG

SPECIES: L. plumulosus DATES: 5/19/95

RECEIVING [X] CULTURE [ ] LOG #: 95-0056 INITIAL STOCK @: 600+

TEST JOB #: ____ CLIENT: ____ FOOD TYPE: ____

		Temp/DO	NH_3/NO_2	pH	Sal/~~Hard~~	Alkalinity	Mortality	Remarks/Initials
5/19	Day 1	11.0°C/9.1	0/0	7.3	14.0 ppt	56	Ø	Acclimation started CI
5/20	Day 2	14.5°C/8.8	0/0	7.9	18.0 ppt	72	Ø	Acclimation continued moved to Algae cup CI
5/21	Day 3	19.0°C/7.8	0/0	8.1	21.0 ppt	88	Ø	Acclimation continued moved to Aquarium CI
5/22	Day 4	22.0°C/6.8	0/0	8.1	24.5 ppt	104	Ø	Acclimation concluded CI
5/23	Day 5	22.0°C/6.7	0/0	8.2	25.0 ppt	112	Ø	CI
5/24	Day 6	22.0°C/7.0	0/0	8.0	25.0 ppt	100	Ø	Acclimation to 22 ppt started then to SCT CI
	Day 7							
	Day 8							
	Day 9							
	Day 10							
	Day 11							
	Day 12							
	Day 13							
	Day 14							
	Day 15							

AQUA SURVEY, INC.

CULTURE LAB ACCLIMATIZATION FORM

Acclimatization

[ ] NO ACCLIMATIZATION REQUIRED
[X] TEMP. ACCLIMATIZATION
[✓] WATER ACCLIMATIZATION

JOB #: ______ TEST SPECIES: L. plumulosus

ACCLIMATIZATION INITIAL PARAMETERS

TEMP: 11.0 °C SALINITY: 14.0 ppt TYPE OF WATER: Receiving water

ACCLIMATIZATION TARGET PARAMETERS

TEMP: ______ SALINITY: ______ TYPE OF WATER: Manasquan

ACCLIMATIZATION CHAMBER VOLUME (LITERS): 38 l tank

ACCLIMATIZATION LOCATION: see below

ACCLIMATIZATION WATER TYPE: Manasquan

ACCLIMATIZATION WATER TEMP.: 20.0 °C

ACCLIMATIZATION COMMENCEMENT - DATE/TIME: 5/14/95 / 1130 hrs

CHANGE OVER RATE (APPROX. mL/MINUTE): 10-20 ml / min

ACCLIMATIZATION CONCLUSION - DATE/TIME: 5/22/95 / 0800 hrs

TECHNICIAN INITIALS/COMMENCEMENT: CD

TECHNICIAN INITIALS/CONCLUSION: CD

SUPERVISOR INITIALS: CD

REMARKS: ______

AQUA SURVEY, INC.

CULTURE LAB DISTRIBUTION FORM

DATE: 5/24/95

TEST JOB #: SRT

CLIENT: In house

TEST LOCATION:

IN-LAB [X] FIELD [ ]

TEST SPECIES: L. plumulosus

TOTAL NUMBER OF ORGANISMS TRANSFERRED: 180+

AQUA SURVEY, INC. CULTURE LAB INVESTIGATORS: CD

A. ORGANISMS

1. ASI CULTURE/HOLDING UNIT: 38 l tank 95-0407
2. RECEIVING LOG #: 95-0056 East Coast Amphipod
3. CULTURE LOT #: U011D
4. AGE/SIZE INFORMATION: 2-4 mm long

B. HOLDING [X] CULTURE [ ] WATER PARAMETERS

1. TEMPERATURE: 22.0 °C
2. SALINITY: 25.0 ppt
3. WATER SOURCE: Manasquan

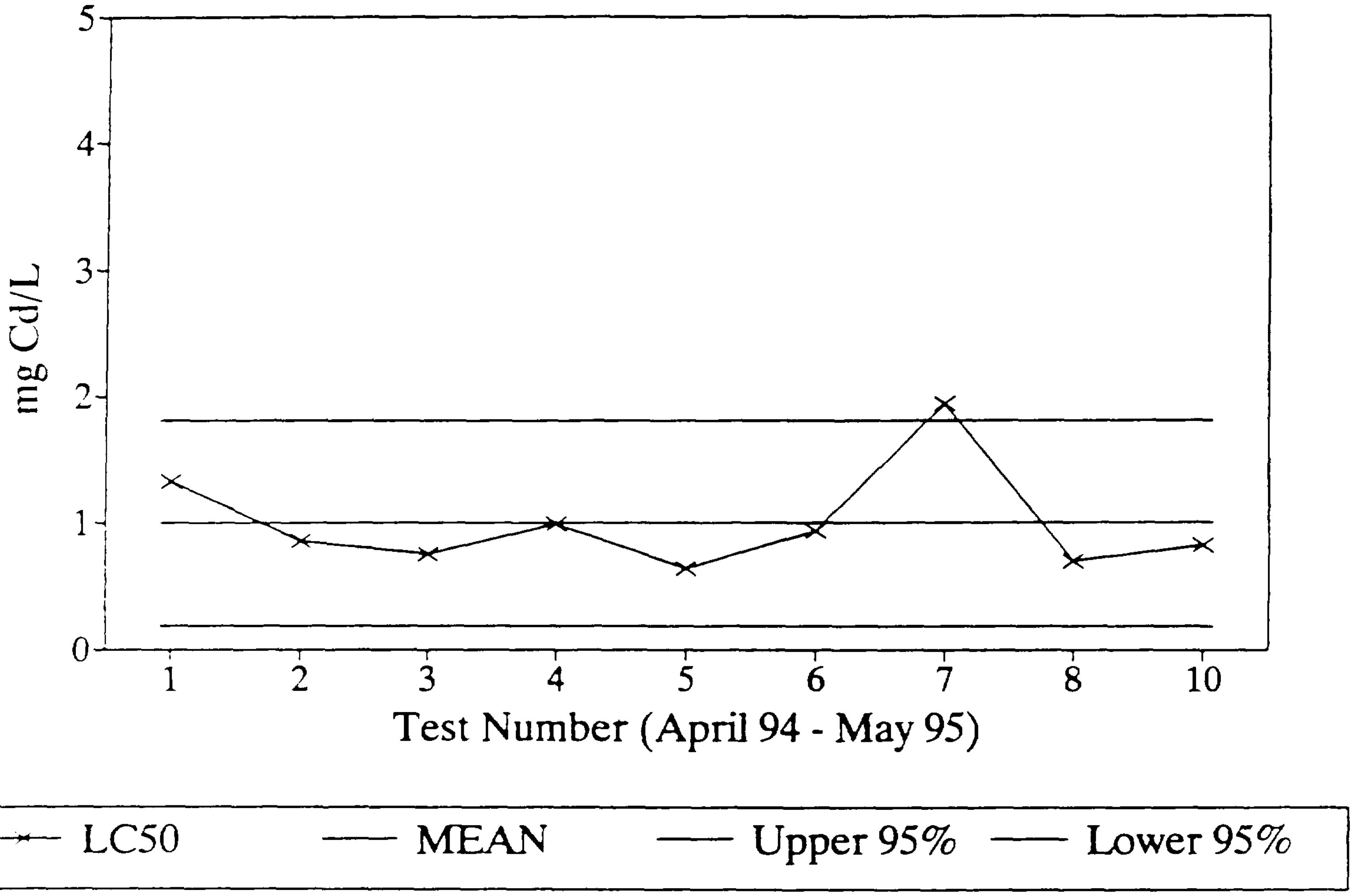
C. TRANSFER CUSTODY & TRANSFER

1. LIVESTOCK RELINQUISHMENT DATE: 5/24/95 TIME: 1300 BY: CD
2. LIVESTOCK RECEIVING DATE: 5/24/95 TIME: 1300 BY: MTH
3. CULTURE SUPERVISOR OR LEAD CULTURIST INITIALS: CD

REMARKS:

Control Chart of Point Estimate Values

Acute SRT Tests with L. plumulosus



A

P

P

E

N

D

I

X

B

Roy F. Weston 95-177

Penaeus vannamei

Randomized by JN

Minitab 5/23/95

Beaker	Sample		Sediment	ASI No
11	12	Control		*
11	5	Control		*
10	9	Control		*
11	10	Reference	A-H01508	5001
10	3	Reference	A-H01508	5001
10	11	Reference	A-H01508	5001
10	8	36	B-I01540	5007
11	7	36	B-I01540	5007
11	2	36	B-I-1540	5007
11	4	17-18	A-H01545	5008
11	1	17-18	A-H01545	5008
11	6	17-18	A-H01545	5008

AQUA SURVEY, INC.
LIVE COUNTS

CLIENT: WESTON INITIAL COUNTS: 11 TEST START DATE: 5/26/95
JOB #: 95-177 ORGANISM: P.v.

Chamber #	ID #	Test Counts						Final		Sample Codes
		Day 1		Day 2		Day 3		#	Init.	
		#	Init.	#	Init.	#	Init.			
1		11	11							
2		11	11							
3		10	11							
4		11	11							
5		11	11							
6		11	11							
7		11	11							
8		10	11							
9		10	11							
10		11	11							
11		10	11							
12		11	11							
13										
14										
15										
16										
17										
18										
19										
20										
Date	6/5/95									
Initials	MTH									

NOTES:

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston TEST START DATE: 5-26-95 PARAMETER: Temperature
JOB #: 95-177 ORGANISM LOG #: 95-0055

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		19.0	20.0	20.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
2		19.0	20.0	20.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
3		19.0	20.0	20.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
4		19.0	20.0	20.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
5		19.0	20.0	20.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
6		19.0	20.0	20.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
7		19.0	20.0	20.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
8		19.0	20.0	20.0	19.5	19.0	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
9		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
10		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
11		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
12		19.0	20.0	20.0	19.5	19.5	19.0	20.0	19.0	20.0	19.0	19.0	20.0	19.0
Initials		MTH	MTH	MTD	NMH	AMD	MTH AMD	MTH NMH	ES MTH	ES MTH	MTH	MTH	MTH	MTH
Date		5/26	5/26	5/26	5/27	5/28	5/29	5/30	5/31	6/1	6/2	6/3	6/4	6/5

FINAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1						19.5		20.0		20.0		19.0		
2						20.0		20.0		20.0		19.0		
3						20.0		20.0		20.0		19.0		
4						20.0		20.0		20.0		19.0		
5						20.0		20.0		20.0		19.0		
6						20.0		20.0		20.0		19.0		
7						20.0		20.0		20.0		19.0		
8						20.0		20.0		20.0		19.0		
9						20.0		20.0		20.0		19.0		
10						20.0		20.0		20.0		19.0		
11						20.0		20.0		20.0		19.0		
12						20.0		20.0		20.0		19.0		
Initials						MTH		MTH		MTH		MTH		
Date						5/27		5/30		6/1		6/3		

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston   TEST START DATE: 5-26-95   PARAMETER: D.O
JOB #: 95-122   ORGANISM LOG #: 95-0059

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		6.1	7.6	8.0	26	7.2	7.6	7.5	7.6	7.5	7.4	7.3	7.6	7.5
2		6.3	7.6	6.3	22	7.2	7.6	7.5	7.6	7.5	7.4	7.3	7.6	7.4
3		6.3	7.7	7.7	22	7.1	7.6	7.6	7.6	7.5	7.3	7.3	7.6	7.5
4		6.3	7.7	8.1	29	7.4	7.6	7.5	7.6	7.5	7.4	7.3	7.6	7.4
5		6.1	7.7	8.1	79	7.2	7.6	7.6	7.6	7.5	7.4	7.3	7.6	7.5
6		6.2	7.7	7.9	29	7.4	7.6	7.5	7.6	7.5	7.4	7.3	7.6	7.5
7		6.2	7.6	8.0	79	7.2	7.6	7.5	7.6	7.5	7.4	7.3	7.6	7.5
8		6.2	7.7	8.0	79	7.4	7.6	7.5	7.6	7.5	7.4	7.4	7.6	7.5
9		6.2	7.7	7.8	29	7.0	7.6	7.5	7.4	7.1	7.4	7.3	7.6	7.4
10		6.3	7.6	7.8	29	7.2	7.6	7.5	7.5	7.3	7.3	7.3	7.6	7.4
11		6.3	7.7	8.0	79	7.4	7.6	7.5	7.5	7.5	7.4	7.3	7.6	7.4
12		6.2	7.3	8.0	79	~~7.4~~ 1	7.5	7.6	7.4	7.5	7.4	7.3	7.6	7.4
Initials		MTH	MTH	MTH	VAH	AMD	MTH AMD	MTH VAH	MTH ES	MTH ES	MTH	MTH	MTH	MTH
Date		5/26	5/26	5/26	5/27	5/29	5/29	5/30	5/31	6/1	6/2	6/3	6/4	6/5

1 7.4

FINAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1						7.8		7.3		7.3		7.1		
2						7.8		7.3		7.3		7.1		
3						7.9		7.3		7.3		7.1		
4						7.2		7.3		7.3		7.1		
5						7.2		7.3		7.4		7.1		
6				NA		7.8	NA	7.3	NA	7.3	NA	7.1	NA	
7						7.9		7.3		7.3		7.1		
8						7.9		7.3		7.4		7.1		
9						7.9		7.3		7.4		7.1		
10						7.9		7.3		7.4		7.1		
11						7.9		7.3		7.3		7.1		
12						7.2		7.3		7.4		7.1		
Initials						MTH		MTH NCF		MTA		MTH		
Date						5/28		5/30		6/1		6/3		

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston TEST START DATE: 5-26-95 PARAMETER: pH
JOB #: 95-177 ORGANISM LOG #: 95-0057 P. v.

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		7.3	7.4	8.1	8.0	7.9	8.2	8.1	8.2	7.9	8.1	8.2	8.2	8.0
2		7.3	7.4	8.1	8.0	8.1	8.2	8.1	8.2	8.0	8.2	8.2	8.2	8.0
3		7.4	7.3	8.1	8.0	7.9	8.1	8.1	8.2	8.0	8.1	8.2	8.2	7.9
4		7.3	7.4	8.1	8.0	8.0	8.1	8.1	8.2	8.0	8.1	8.2	8.2	8.0
5		7.3	7.4	8.1	8.0	8.2	8.3	8.3	8.2	8.4	8.5	8.3	8.2	8.4
6		7.4	7.4	8.1	8.0	8.0	8.2	8.2	8.2	8.2	8.1	8.2	8.2	8.0
7		7.3	7.4	8.1	8.0	8.1	8.2	8.2	8.2	8.2	8.1	8.2	8.2	8.0
8		7.4	7.4	8.1	8.0	8.1	8.2	8.1	8.2	8.3	8.2	8.2	8.2	8.0
9		7.3	7.4	8.1	8.0	8.1	8.2	8.3	8.2	8.4	8.3	8.2	8.2	8.5
10		7.3	7.4	8.1	8.0	8.0	8.3	8.1	8.2	8.0	8.2	8.2	8.2	8.0
11		7.3	7.4	8.1	8.0	8.0	8.2	8.1	8.2	8.0	8.3	8.3	8.2	8.0
12		7.4	7.4	8.1	8.0	8.2	8.2	8.3	8.2	8.4	8.2	8.2	8.2	8.4
Initials		MTH	MTH	MTH	NMH	AMD	MTH AMD	MTH NMH	ES MTH	ES MTH	MTH	MTH	MTH	MTH
Date		5-26	5-26	5-27	5-27	5-28	5-29	5/30	5/31	6/1	6/2	6/3	6/4	6/5

FINAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1						8.0		8.0		8.2		7.8		
2						8.0		8.0		8.2		7.8		
3						8.1		8.0		8.3		7.8		
4						8.0		8.0		8.2		7.8		
5			NA			8.0	NA	8.0	NA	8.6	NA	7.8	NA	
6						8.0		8.0		8.5		7.8		
7						8.0		8.0		8.4		7.8		
8						8.0		8.0		8.3		7.8		
9						8.0		8.0		8.6		7.8		
10						8.0		8.0		8.4		7.8		
11						8.0		8.0		8.5		7.8		
12						8.0		8.0		8.4		7.8		
Initials						MTH		MTH		MTH		MTH		
Date						5-28		5-30		6-1		6-3		

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston
JOB #: 95-122

TEST START DATE: 5-26-95
ORGANISM LOG #: 95-0057

PARAMETER: Salinity

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		21.5	22.0	20.5	21.0	23.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.5
2		21.5	22.0	21.0	21.0	23.0	22.9	22.0	22.0	22.0	22.0	22.0	22.0	22.5
3		21.5	22.0	21.0	21.0	22.0	22.0	21.0	22.0	22.0	22.0	22.0	22.0	22.5
4		21.5	22.0	21.0	21.0	23.0	22.0	21.0	22.0	22.0	22.0	22.0	22.0	22.5
5		21.5	22.0	21.5	21.0	23.5	22.0	22.5	22.0	22.5	22.0	22.0	22.0	22.5
6		21.5	22.0	21.5	21.0	23.0	22.0	21.5	22.0	22.5	22.0	22.0	22.0	22.5
7		21.5	22.0	21.5	21.5	23.0	22.0	21.5	22.0	22.5	22.0	22.0	22.0	22.5
8		21.5	22.0	21.6	21.5	23.0	22.0	21.5	22.0	22.5	22.0	22.0	22.0	22.5
9		21.5	22.0	21.0	21.5	23.5	22.0	22.5	22.0	22.5	22.0	22.0	22.0	22.0
10		21.5	22.0	21.0	21.0	22.0	22.0	21.0	22.0	22.5	22.0	22.0	22.0	22.5
11		21.5	22.0	20.5	21.5	22.0	22.0	21.0	22.0	22.5	22.0	22.0	22.0	22.5
12		21.5	22.0	21.5	21.0	23.0	22.0	22.5	22.0	22.5	22.0	22.0	22.0	22.5
Initials		MTH	MTH	MTH	[illegible]	AMD	MTH AMD	MTH NMH	ES MTH	ES MH	MTH	MTH	MTH	MTH
Date		5/26	5/26	5/26	5/27	5/28	5/29	5/30	5/31	6/1	6/2	6/3	6/4	6/5

FINAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1						22.0		22.0		22.0		21.0		
2						22.0		22.0		22.0		21.0		
3						22.0		22.0		22.0		21.0		
4						22.0		22.0		22.0		21.0		
5				NA		22.0	NA	22.0	NA	22.0	NA	21.0	NA	
6						22.0		22.0		22.0		21.0		
7						22.0		22.0		22.0		21.0		
8						22.0		22.0		22.0		21.0		
9						22.0		22.0		22.0		21.0		
10						22.0		22.0		22.0		21.0		
11						22.0		22.0		22.0		21.0		
12						22.0		22.0		22.0		21.0		
Initials						MTH		MTH		MTH		MTH		
Date						5/28		5/30		6/1		6/3		

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: WESTON
JOB #: 95-177

TEST START DATE: 5/26/95
ORGANISM LOG #: 95-0057

PARAMETER: Observations

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		N	N	N	✓	N	N	N	N	N	N	N	N	N
2		N	N	N	✓	N	N	N	N	N	N	N	N	N
3		N	N	N	✓	N	N	N	N	N	N	N	N	N
4		N	N	N	✓	N	N	N	N	N	N	N	N	N
5		N	N	N	✓	N	N	N	N	N	N	N	N	N
6		N	N	N	✓	N	N	N	N	N	N	N	N	N
7		N	N	N	✓	N	N	N	N	N	N	N	N	N
8		N	N	N	✓	N	N	N	N	N	N	N	N	N
9		N	N	N	✓	N	N	N	N	N	N	N	N	N
10		N	N	N	✓	N	N	N	N	N	N	N	N	N
11		N	N	N	✓	N	N	N	N	N	N	N	N	N
12		N	N	N	✓	N	N	N	N	N	N	N	N	N
Initials		MTH	MTH	MTH	WML	AMD	MTH	MTH	MTH	MTH	MTH	MTH	MTH	MTH
Date		5/26	5/26	5/26	5/27	5/28	5/29	5/30	5/31	6/1	6/2	6/3	6/4	6/5

FINAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1						N								
2						N								
3						N								
4						N								
5						N								
6						N								
7						N								
8						N								
9						N								
10						N								
11						N								
12						N								
Initials						MTH								
Date						5/28								

AQUA SURVEY, INC.
SOLID PHASE READINGS

CLIENT: Weston
JOB #: 95-177

TEST START DATE: 5-26-95 PARAMETER: Feeding
ORGANISM LOG #: 95-0057

INITIAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1		✓			✓		✓		✓		✓		✓	
2		✓			✓		✓		✓		✓		✓	
3		✓			✓		✓		✓		✓		✓	
4		✓			✓		✓		✓		✓		✓	
5		✓			✓		✓		✓		✓		✓	
6		✓			✓		✓		✓		✓		✓	
7		✓			✓		✓		✓		✓		✓	
8		✓			✓		✓		✓		✓		✓	
9		✓			✓		✓		✓		✓		✓	
10		✓			✓		✓		✓		✓		✓	
11		✓			✓		✓		✓		✓		✓	
12		✓			✓		✓		✓		✓		✓	
Initials		MTH			MTH		MTH		MTH		MTH		MTH	
Date		5/26			5/27		5/29		5/31		6/2		6/4	

FINAL READINGS

#	ID #	0 H	6 H	12 H	24 H	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days
1														
2														
3														
4														
5														
6									NA					
7														
8														
9														
10														
11														
12														
Initials														
Date														

AQUA SURVEY, INC.

CULTURE LAB RECEIVING FORM

RECEIVING LOG #: 95-0057　　DATE: 5/17/95

SHIPPING CARRIER: Airborne　　CARRIER LOG #: 889 008 0894

SPECIES: Penaeus Vannamei　　NUMBER SHIPPED: 500+

LIVESTOCK SOURCE/SHIPPER: Aquatic Research Organisms

SHIPPER INVOICE #: 11011　　PACKER'S NAME: L.M.

ASI ORDER REF. DATE: 5/17/95　　ASI REF INITIALS: EC

AGE/SIZE CHARACTERISTICS: HD 4/25/95

TAXONOMIC CERTIF. BY: ______　　DATE: ______

RECEIVING/WATER QUALITY PARAMETERS:

D.O.: Sat　　TEMP: 21.0°C　　NH_3/NO_2: 1.5/0

SALINITY/~~HARDNESS~~: 27.0ppt　　ALK: 124　　pH: 7.1

WATER-(CLEAR/CLOUDY)　　CONTAINER SIZE/NUMBER: 1 gallon jugs / 2

OF BLUE ICE: Ø　　TYPE OF PACKING: Styrofoam box

OBSERVATION/CONDITION OF LIVESTOCK: Appear healthy. C. 15 dead due to cannabolism.

RECEIVING TECH. INT.: CD　　SUPERVISOR'S INITIALT: CD

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species: PENAEUS VANNAMEI

Source: Lab reared X Hatchery reared ____ Field collected ____

Hatch date 4/25/95 Receipt date ____

Lot number ____ Strain ____

Brood Origination FL

II. Water Quality

Temperature 25 °C Salinity 28 ppt DO ____

pH 8.0 Hardness — ppm

III. Culture Conditions

System: STATIC S.W.

Diet: Flake Food ____ Phytoplankton ____ Trout Chow ____

Brine Shrimp ____ Rotifers ____ Other FOOD INCLUDED

Prophylactic Treatments: ____

Comments: ____

IV. Shipping Information

Client: AQUA SURVEY # of Organisms: 500+

Carrier: AIRBORNE Date Shipped: 5/18/95

Biologist: [signature]

1-800-927-1650

PO Box 1271 • One Lafayette Road • Hampton, NH 03842 • (603) 926-1650

AQUA SURVEY, INC.

CULTURE LAB ACCLIMATIZATION FORM

Acclimatization

[ ] NO ACCLIMATIZATION REQUIRED
[ ] TEMP. ACCLIMATIZATION
[X] WATER ACCLIMATIZATION

JOB #: ____________ TEST SPECIES: P. vannamei

ACCLIMATIZATION INITIAL PARAMETERS

TEMP: 22.0°C SALINITY: 26.0 ppt TYPE OF WATER: Manasquan

ACCLIMATIZATION TARGET PARAMETERS

TEMP: 22.0°C SALINITY: 23.0 ppt TYPE OF WATER: Manasquan

ACCLIMATIZATION CHAMBER VOLUME (LITERS): (2) 76 l tanks

ACCLIMATIZATION LOCATION: Culture Annex Room

ACCLIMATIZATION WATER TYPE: Manasquan

ACCLIMATIZATION WATER TEMP.: 22.0°C

ACCLIMATIZATION COMMENCEMENT - DATE/TIME: 5/24/95 / 0900 hrs

CHANGE OVER RATE (APPROX. mL/MINUTE): 10-20 ml/min

ACCLIMATIZATION CONCLUSION - DATE/TIME: 5/26/95 / 1030 hrs

TECHNICIAN INITIALS/COMMENCEMENT: CD

TECHNICIAN INITIALS/CONCLUSION: CD

SUPERVISOR INITIALS: CD

REMARKS: ____________

AQUA SURVEY, INC.
CULTURE LABORATORY

15 DAY - GENERAL SPECIES STATUS LOG

SPECIES: P. vannamei DATES: 5/19/95

RECEIVING [Y] CULTURE [ ] LOG #: 95-0057 INITIAL STOCK @: 500+

TEST JOB #: ______ CLIENT: ______ FOOD TYPE: A. salina / ground meal

		Temp/DO	NH_3/NO_2	pH	Sal/Hard	Alkalinity	Mortality	Remarks/Initials
5/19	Day 1	21.0°C/sat	1.5/0	7.1	27.0 ppt	124	10-15*	Acclimation started Fed A. salina CD
5/20	Day 2	21.0°C/7.2	0.25/0	8.1	28.5 ppt	124	Ø	Acclimation continued Fed A. salina CD
5/21	Day 3	21.5°C/7.4	0.25/0	8.1	29.0 ppt	116	Ø	Acclimation continued Fed A. salina / powder CD
5/22	Day 4	22.0°C/6.5	0.25/0	8.1	29.0 ppt	124	Ø	Acclimation to 25 ppt started. Fed A. salina CD
5/23	Day 5	22.5°C/6.8	0.25/0	8.2	26.0 ppt	116	Ø	Acclimation continued Fed A. salina CD
5/24	Day 6	22.5°C/7.0	0.25/0	8.0	26.0 ppt	104	Ø	Acclimation to 22 ppt started. Fed A. salina CD
5/25	Day 7	22.5°/7.8	0.25/0	8.0	24.0 ppt	92	Ø	Acclimation continued Fed A. salina CD
5/26	Day 8	21.5°C/7.3	0.25/0	8.1	22.0 ppt	88	Ø	Acclimation concluded Fed A. salina CD
	Day 9							
	Day 10							
	Day 11							
	Day 12							
	Day 13							
	Day 14							
	Day 15							

* due to Cannibalism

B-12

AQUA SURVEY, INC.

CULTURE LAB DISTRIBUTION FORM

DATE: 5/26/95

TEST JOB #: ____________ CLIENT: Weston

TEST LOCATION: IN-LAB [✓] FIELD [ ]

TEST SPECIES: P. vannamei

TOTAL NUMBER OF ORGANISMS TRANSFERRED: 150+

AQUA SURVEY, INC. CULTURE LAB INVESTIGATORS: CD

A. ORGANISMS

1. ASI CULTURE/HOLDING UNIT: (2) 76 l tanks 95-0413
2. RECEIVING LOG #: 95-0057 ARO
3. CULTURE LOT #: V011
4. AGE/SIZE INFORMATION: HD 4/25/95

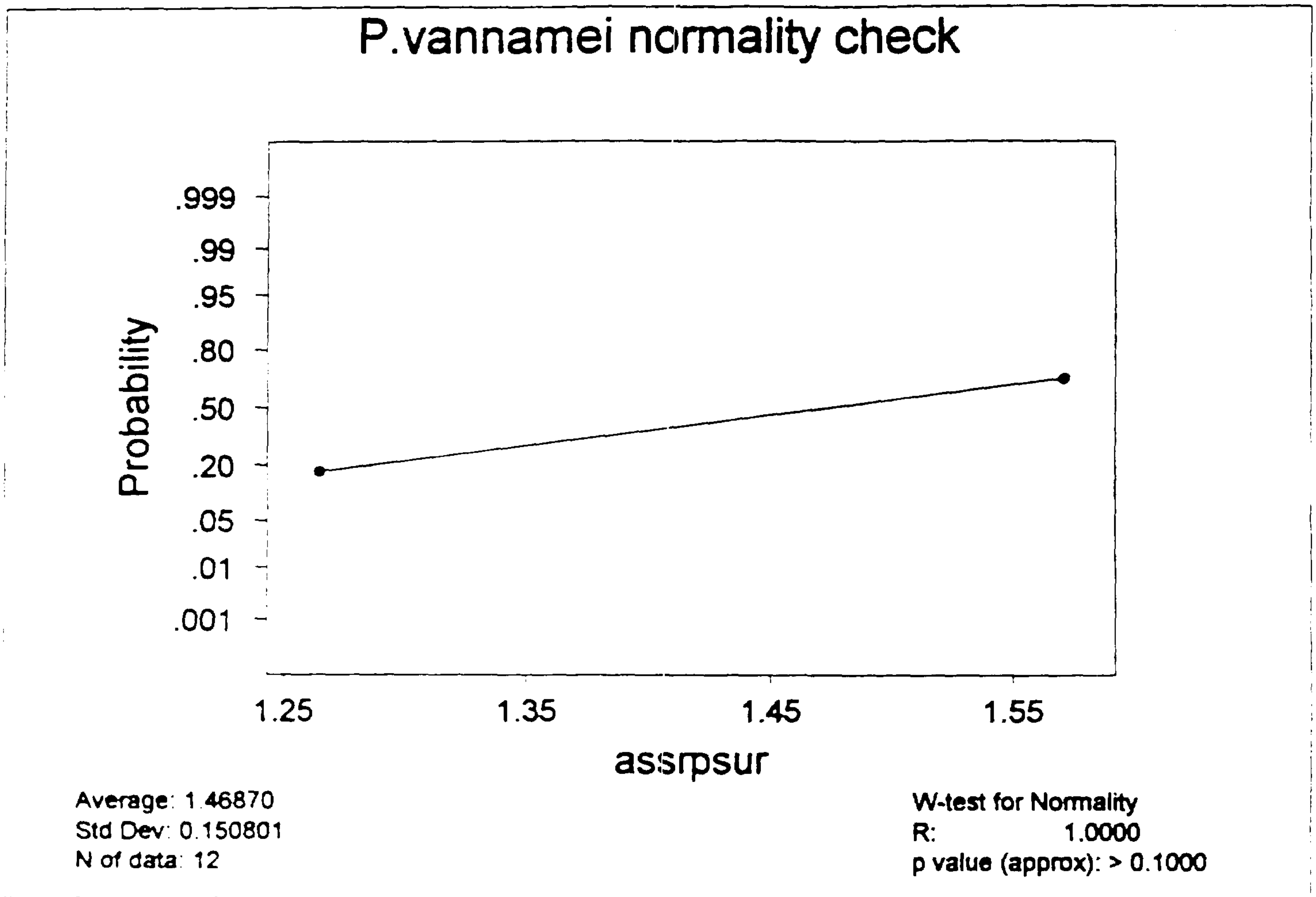
B. HOLDING [✓] CULTURE [ ] WATER PARAMETERS

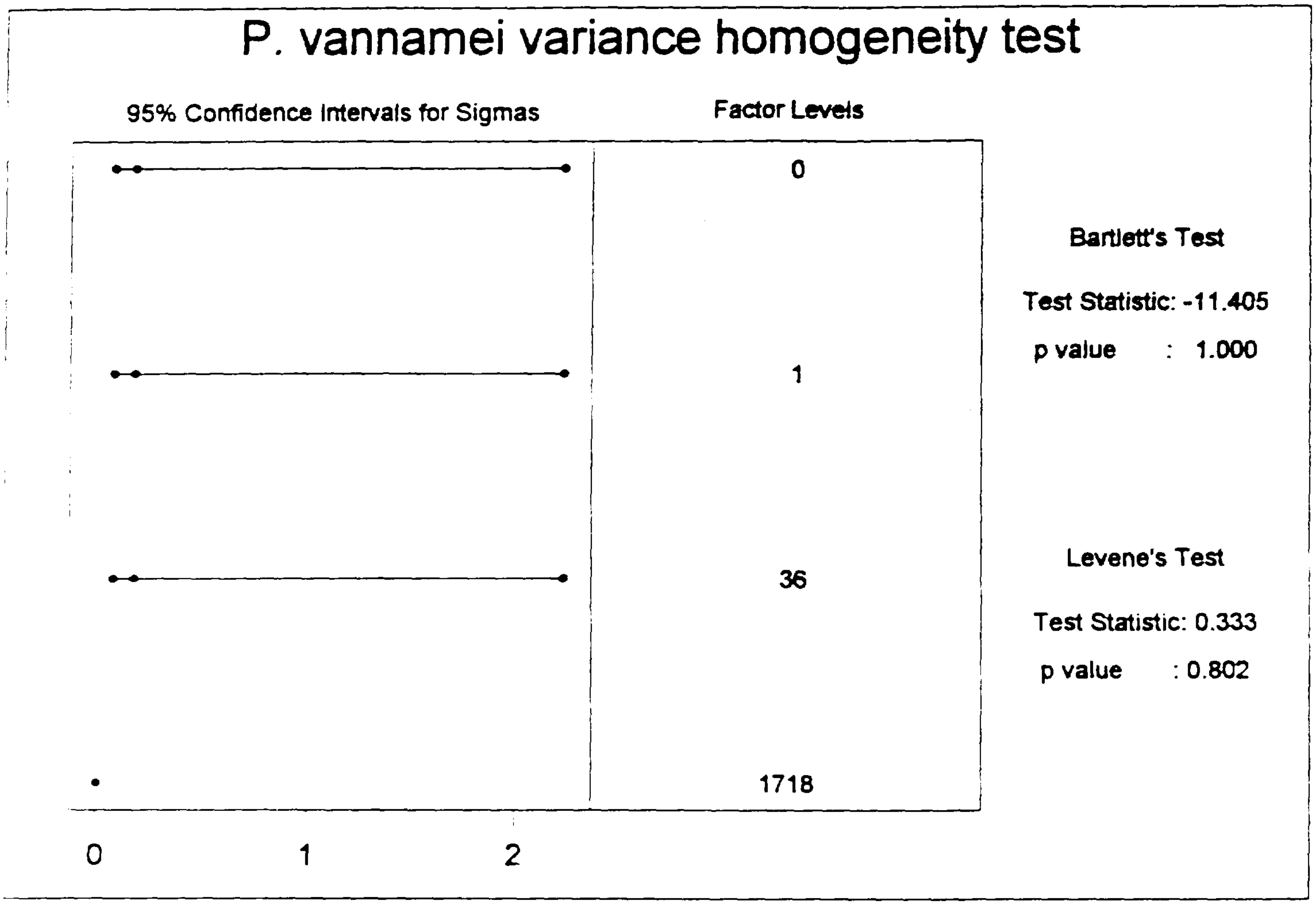
1. TEMPERATURE: 21.5°C
2. SALINITY: 22.0 ppt
3. WATER SOURCE: Manasquan

C. TRANSFER CUSTODY & TRANSFER

1. LIVESTOCK RELINQUISHMENT DATE: 5/26/95 TIME: 1030 BY: CD
2. LIVESTOCK RECEIVING DATE: 5/26/95 TIME: 1030 BY: MTH
3. CULTURE SUPERVISOR OR LEAD CULTURIST INITIALS: CD

REMARKS: ____


P.vannamei normality check
Probability
.999
.99
.95
.80
.50
.20
.05
.01
.001
1.25
1.35
1.45
1.55
assrpsur
Average: 1.46870
Std Dev: 0.150801
N of data: 12
W-test for Normality
R: 1.0000
p value (approx): > 0.1000


P. vannamei variance homogeneity test
95% Confidence Intervals for Sigmas
Factor Levels
0
1
36
1718
0
1
2
Bartlett's Test
Test Statistic: -11.405
p value : 1.000
Levene's Test
Test Statistic: 0.333
p value : 0.802

Homogeneity of Variance

Response assrpsur
Factors trtment
ConfLvl 95.0000

Bonferroni confidence intervals for standard deviations

Lower	Sigma	Upper	n	Factor Levels
7.85E-02	0.176829	2.23323	3	0
7.85E-02	0.176829	2.23323	3	1
7.85E-02	0.176829	2.23323	3	36
0.00E+00	0.000000	0.00000	3	1718

Bartlett's Test (normal distribution)

Test Statistic: -11.405
p value : 1.000

Levene's Test (any continuous distribution)

Test Statistic: 0.333
p value : 0.802

One-Way Analysis of Variance

```
Analysis of Variance on assrpsur
Source     DF        SS        MS         F        p
trtment     3    0.0625    0.0208      0.89    0.487
Error       8    0.1876    0.0235
Total      11    0.2501
                                    Individual 95% CIs For Mean
                                    Based on Pooled StDev
 Level      N      Mean     StDev   --+---------+---------+---------+----
     0      3    1.4687    0.1768          (---------*----------)
     1      3    1.3666    0.1768    (---------*----------)
    36      3    1.4687    0.1768          (---------*----------)
  1718      3    1.5708    0.0000               (----------*---------)
                                    --+---------+---------+---------+----
Pooled StDev =   0.1531             1.20      1.40      1.60      1.80

Dunnett's intervals for treatment mean minus control mean

    Family error rate = 0.0500
Individual error rate = 0.0205

Critical value = 2.88

Control = level 0 of trtment

Level       Lower     Center     Upper ---------+---------+---------+---------+--
    1     -0.4622    -0.1021    0.2580  (-------------*-------------)
   36     -0.3601     0.0000    0.3601      (-------------*-------------)
 1718     -0.2580     0.1021    0.4622          (-------------*-------------)
                                       ---------+---------+---------+---------+--
                                            -0.25      0.00      0.25      0.50
```

Descriptive Statistics

Variable	trtment	N	Mean	Median	TrMean	StDev	SEMean
propsurv	0	3	0.9697	1.0000	0.9697	0.0525	0.0303
	1	3	0.9394	0.9091	0.9394	0.0525	0.0303
	36	3	0.9697	1.0000	0.9697	0.0525	0.0303
	1718	3	1.0000	1.0000	1.0000	0.0000	0.0000

Variable	trtment	Min	Max	Q1	Q3
propsurv	0	0.9091	1.0000	0.9091	1.0000
	1	0.9091	1.0000	0.9091	1.0000
	36	0.9091	1.0000	0.9091	1.0000
	1718	1.0000	1.0000	1.0000	1.0000

SAMPLE ID: SRT Penaeus vannamei 5/26/95 CdCl2

CONCENTRATION	NUMBER EXPOSED	NUMBER AFFECTED	PERCENT AFFECTED	BINOMIAL PROBABILITY (%)
13.0000	30	30	100.0000000	0.0000001
7.2000	30	22	73.3333400	0.8062400
4.0000	30	14	46.6666700	42.7767800
2.2000	30	6	20.0000000	0.0715453
1.2000	30	0	0.0000000	0.0000001

RESULTS

METHOD	SPAN	G	EC50	95 PERCENT CONFIDENCE LIMITS
BINOMIAL			4.295040	2.200000 - 7.200000
MOVING AVERAGE	4	0.032886	4.167601	3.611013 - 4.823637
PROBIT		0.066715	4.219030	3.570420 - 4.988372

INTERPRETATION OF STATISTICS

The order of preference of results is:
BEST: Probit Method
BETTER: Moving Average
GOOD: Binomial
GOOD: Graphic Interpolation (Graph drawn by hand)
assuming all are statistically valid.

To Determine if a method has given valid results:
GRAPHICAL: Always valid
BINOMIAL: The program will tell you if this is not valid.
MOVING AVERAGE: The number of spans needs to be no less than one lower than the number of concentrations tested (excluding control).
PROBIT: The program will tell you if this is not valid

96 HOUR REFERENCE TOXICANT TEST

CLIENT: WESTON TOXICANT: $CdCl_2$ SPECIES: P. vannamei TEST WATER: 22 ppt [illegible] TEST VOL: 1 l

TEST TEMP.: 20 ± 2 START DATE: 5/26/95 END DATE: 5/30/95 START TIME: 12:00 PM END TIME: 12:00 PM

SAMPLE CONC.	LIVE COUNT					pH					SALINITY (ppt)				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
Control A	10	10	10	11	10	8.4	8.0	8.2	8.2	7.9	21.5	21.0	22.0	22.0	21.5
Control B	10	10	10	10	10	8.4	8.0	8.2	8.2	7.9	21.5	21.0	22.0	22.0	21.5
Control C	10	10	10	10	10	8.4	8.0	8.3	8.3	8.1	21.5	21.0	22.0	22.0	21.0
1.3A	10	10	10	10	10	8.4	8.0	8.3	8.3	8.1	21.5	21.0	22.0	22.0	21.0
1.3B	10	10	10	10	10	8.4	8.0	8.3	8.2	8.1	21.5	21.0	22.0	22.0	21.0
1.3C	10	10	10	10	10	8.4	8.0	8.3	8.3	8.1	21.5	21.0	22.0	22.0	21.0
3.3A	10	10	10	7^{3}	7^{0}	8.4	8.0	8.3	8.2	8.1	21.5	21.0	22.0	22.0	21.0
3.3B	10	10	10	9^{1}	9^{0}	8.4	8.0	8.3	8.2	8.1	21.5	21.0	22.0	22.0	21.0
3.3C	10	10	10	10	8^{2}	8.4	8.0	8.2	8.2	8.1	21.5	21.0	22.0	22.0	21.0
4.0A	10	10	7^{3}	6^{1}	5^{1}	8.4	8.0	8.3	8.2	8.1	21.5	21.0	22.0	22.0	21.0
4.0B	10	10	8^{1}	7^{1}	5^{2}	8.4	8.0	8.3	8.2	8.1	21.5	21.0	22.0	22.0	21.0
4.0C	10	10	8^{2}	6^{2}	6^{0}	8.4	8.0	8.3	8.3	8.1	21.5	21.0	22.0	22.0	21.0
7.2A	10	10	7^{3}	4^{3}	3^{2}	8.4	8.0	8.2	8.2	8.0	21.5	21.0	22.0	22.0	21.0
7.2B	10	10	5^{4}	4^{1}	3^{1}	8.4	8.0	8.3	8.3	8.1	21.5	21.0	22.0	22.0	21.0
7.2C	10	11	7^{3}	6^{1}	3^{3}	8.4	8.0	8.2	8.2	8.0	21.5	21.0	22.0	22.0	21.0
13.0A	10	10	6^{4}	4^{2}	0^{4}	8.5	8.2	8.3	8.2	8.1	21.5	21.0	22.0	22.0	21.5
13.0B	10	10	6^{4}	2^{4}	0^{2}	8.5	8.2	8.3	8.3	8.1	21.5	21.0	22.0	22.0	21.5
13.0B	10	10	7^{3}	3^{4}	0^{3}	8.5	8.2	8.3	8.3	8.1	21.5	21.0	22.0	22.0	21.0
Date/Initials	5-26 MTH	5-27 MTH	5/28 AMD	5/29 MTH AMD	5/30 MTH NMH	5-26 MTH	5-27 NMH	5/28 AMD	5/29 MTH AMD	5/30 MTH	5-26 MTH	5-27 NMH	5/28	5/29 MTH	5/30 MTH

NMH AMD NMH

SAMPLE CONC.	TEMPERATURE					DISSOLVED OXYGEN (mg/L)					Notes & Observations
	00	24	48	72	96	00	24	48	72	96	
Control A	19.5	19.5	19.5	18.5	20.0	7.7	2.9	5.6	7.6	6.3	
Control B	19.5	19.5	19.5	18.5	20.0	7.7	2.9	5.9	7.6	6.4	
Control C	19.5	19.5	19.5	18.5	20.0	7.7	2.9	5.8	7.6	6.4	
1.3A	19.5	19.5	19.5	18.5	20.0	8.0	2.9	5.9	~~7.6~~	6.4	7.07
1.3B	19.5	19.5	19.5	18.5	20.0	8.0	2.9	6.0	~~7.6~~	6.5	7.25 5/29 AMD
1.3C	19.5	19.5	19.5	18.5	20.0	8.0	2.9	6.1	~~7.6~~	6.4	7.31
3.3A	19.5	19.5	19.5	18.5	20.0	7.9	2.9	5.8	~~7.6~~	5.8	7.3
3.3B	19.5	19.5	19.5	18.5	20.0	7.9	2.9	5.8	~~7.6~~	5.9	7.3
3.3C	19.5	19.5	19.5	18.5	20.0	7.9	2.9	5.9	7.6	5.9	
4.0A	19.5	19.5	19.5	18.5	20.0	8.0	2.9	6.0	7.6	6.2	
4.0B	19.5	19.5	19.5	18.5	20.0	8.0	2.9	6.3	7.6	6.3	
4.0C	19.5	19.5	19.5	18.5	20.0	8.0	2.9	6.4	7.6	6.4	
7.2A	19.5	19.5	19.5	18.5	20.0	7.9	2.2	6.0	7.6	6.5	
7.2B	19.5	19.5	19.5	18.5	20.0	7.9	2.2	6.0	7.6	6.5	
7.2C	19.5	19.5	19.5	18.5	20.0	7.9	2.2	5.4	7.2	6.0	
13.0A	19.5	19.5	19.5	18.5	20.0	7.0	2.5	5.8	7.2	6.4	
13.0B	19.5	19.5	19.5	18.5	20.0	7.0	2.5	6.2	7.2	6.5	
13.0C	19.5	19.5	19.5	18.5	20.0	7.0	2.5	6.3	7.4	6.7	
Date/Initials	5-26 MTH	5-27 NMH	5/28 AMD	5/29 MTH	5/30 MTH	5-26 MTH	5-27 NMH	5/28 AMD	5/29 MTH AMD	5/30 MTH	

AMD NMH NMH

AQUA SURVEY, INC.

CULTURE LAB RECEIVING FORM

RECEIVING LOG #: 95-0057 DATE: 5/17/95

SHIPPING CARRIER: Airborne CARRIER LOG #: 889 008 0894

SPECIES: Peneus Vannamei NUMBER SHIPPED: 500+

LIVESTOCK SOURCE/SHIPPER: Aquatic Research Organisms

SHIPPER INVOICE #: 11011 PACKER'S NAME: L. M.

ASI ORDER REF. DATE: 5/17/95 ASI REF INITIALS: EC

AGE/SIZE CHARACTERISTICS: HD 4/25/95

TAXONOMIC CERTIF. BY: DATE:

RECEIVING/WATER QUALITY PARAMETERS:

D.O.: Sat TEMP: 21.0°C NH_3/NO_2: 1.5/0

SALINITY/~~HARDNESS~~: 27.0 ppt ALK: 124 pH: 7.1

WATER-(CLEAR/CLOUDY) CONTAINER SIZE/NUMBER: 1 gallon jugs / 2

OF BLUE ICE: Ø TYPE OF PACKING: Styrofoam box

OBSERVATION/CONDITION OF LIVESTOCK: Appear healthy. c. 15 dead due to cannabolism.

RECEIVING TECH. INT.: CI SUPERVISOR'S INITIALT: CI

Aquatic Research Organisms

DATA SHEET

I. Organism History

Species: PENAEUS VANNAMEI

Source: Lab reared X Hatchery reared ____ Field collected ____

Hatch date 4/25/95 Receipt date ____

Lot number ____ Strain ____

Brood Origination FL

II. Water Quality

Temperature 25 °C Salinity 28 ppt DO ____

pH 8.0 Hardness — ppm

III. Culture Conditions

System: STATIC S.W.

Diet: Flake Food ____ Phytoplankton ____ Trout Chow ____

Brine Shrimp ____ Rotifers ____ Other FOOD INCLUDED

Prophylactic Treatments: ____

Comments: ____

IV. Shipping Information

Client: AQUASURVEY # of Organisms: 500+

Carrier: AIRBORNE Date Shipped: 5/18/95

Biologist: [signature]

1-800-927-1650

PO Box 1271 • One Lafayette Road • Hampton, NH 03842 • (603) 926-1650

AQUA SURVEY, INC.

CULTURE LAB ACCLIMATIZATION FORM

Acclimatization

[ ] NO ACCLIMATIZATION REQUIRED
[X] TEMP. ACCLIMATIZATION
[✓] WATER ACCLIMATIZATION

JOB #: ______ TEST SPECIES: P. vannamei

ACCLIMATIZATION INITIAL PARAMETERS

TEMP: 21.0°C SALINITY: 27.0 ppt TYPE OF WATER: Receiving wat

ACCLIMATIZATION TARGET PARAMETERS

TEMP: ______ SALINITY: ______ TYPE OF WATER: Manasquan

ACCLIMATIZATION CHAMBER VOLUME (LITERS): 76 l tank

ACCLIMATIZATION LOCATION: Culture Annex Room

ACCLIMATIZATION WATER TYPE: Manasquan

ACCLIMATIZATION WATER TEMP.: 20.0°C

ACCLIMATIZATION COMMENCEMENT - DATE/TIME: 5/19/95 / 1200 hrs

CHANGE OVER RATE (APPROX. mL/MINUTE): 10-20 ml/min

ACCLIMATIZATION CONCLUSION - DATE/TIME: ______

TECHNICIAN INITIALS/COMMENCEMENT: CI

TECHNICIAN INITIALS/CONCLUSION: ______

SUPERVISOR INITIALS: CI

REMARKS: ______

AQUA SURVEY, INC.
CULTURE LABORATORY

15 DAY - GENERAL SPECIES STATUS LOG

SPECIES: P. Vannsmei DATES: 5/19/95

RECEIVING [Y] CULTURE [ ] LOG #: 95-0057 INITIAL STOCK @: 500+

TEST JOB #: CLIENT: FOOD TYPE: A. salina / ground meal

Date		Temp/DO	NH_3/NO_2	pH	Sal/Hard	Alkalinity	Mortality	Remarks/Initials
5/19	Day 1	21.0°C/sat	1.5/0	7.1	27.0 ppt	124	10-15*	Acclimation started fed A. salina CJ
5/20	Day 2	21.0°C/7.2	0.25/0	8.1	28.5 ppt	124	Ø	Acclimation continued fed A. salina CJ
5/21	Day 3	21.5°C/7.4	0.25/0	8.1	29.0 ppt	116	Ø	Acclimation continued fed A. salina / powder CJ
5/22	Day 4	22.0°C/6.5	0.25/0	8.1	29.0 ppt	124	Ø	Acclimation to 25 ppt started. fed A. salina CJ
5/23	Day 5	22.5°C/6.8	0.25/0	8.2	26.0 ppt	116	Ø	Acclimation continued fed A. salina CJ
5/24	Day 6	22.5°C/7.0	0.25/0	8.0	26.0 ppt	104	Ø	Acclimation to 22 ppt started. fed A. salina CJ
	Day 7							
	Day 8							
	Day 9							
	Day 10							
	Day 11							
	Day 12							
	Day 13							
	Day 14							
	Day 15							

* due to Cannibalism

F

AQUA SURVEY, INC.

CULTURE LAB DISTRIBUTION FORM

DATE: 5/26/95

TEST JOB #: SRT CLIENT: In house

TEST LOCATION: IN-LAB [X] FIELD [ ]

TEST SPECIES: P. vannamei

TOTAL NUMBER OF ORGANISMS TRANSFERRED: 180+

AQUA SURVEY, INC. CULTURE LAB INVESTIGATORS: CD

A. ORGANISMS

1. ASI CULTURE/HOLDING UNIT: (2) 76 l tanks 95-0414
2. RECEIVING LOG #: 95-0057 ARO
3. CULTURE LOT #: J011
4. AGE/SIZE INFORMATION: HD 4/25/95

B. HOLDING [X] CULTURE [ ] WATER PARAMETERS

1. TEMPERATURE: 21.5°C
2. SALINITY: 22.0 ppt
3. WATER SOURCE: Manasquan

C. TRANSFER CUSTODY & TRANSFER

1. LIVESTOCK RELINQUISHMENT DATE: 5/26/95 TIME: 1030 BY: CD
2. LIVESTOCK RECEIVING DATE: 5/26/95 TIME: 1030 BY: MTH
3. CULTURE SUPERVISOR OR LEAD CULTURIST INITIALS: CD

REMARKS:

Range finder

96 HR. ~~SALTWATER SCREENING~~ TEST

JOB # 95-177 CLIENT: ______ TEST SPECIES: P aztеca

START DATE: 5-24-95 END DATE: 5-28-95 TEST TEMPERATURE: 20°c ± 2

START TIME: 12:00PM END TIME: 2:30pm TEST WATER: 25ppt Musq TEST VOLUME: 250

	SAMPLE ID	LIVE COUNTS					TEMPERATURE °C					D. O. mg/L					pH				
		00	24	48	72	96	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
0	CONTROL A	5	5	5	5	5	20°C	19.0	19.0	19.5	19.5	8.2	8.3	8.0	8.1	6.5	7.8	7.9	7.9	7.9	7.9
	~~CONTROL B~~																				
.1	A	5	5	5	5	5	20°C	19.0	19.0	19.5	19.5	8.2	8.2	8.1	8.1	6.6	7.8	7.9	7.9	7.9	7.9
	~~B~~																				
1	A	5	5	5	5	5	20°C	19.0	19.0	19.5	19.5	8.2	8.3	8.1	8.1	6.6	7.8	7.9	7.9	7.9	7.9
	~~B~~																				
10	A	5	5	0	–	–	20°C	19.0	19.0	–	–	8.2	8.3	8.1	–	–	7.8	7.9	7.9	–	–
	~~B~~																				
100	A	5	0	0	–	–	20°C	19.0	19.0	–	–	8.2	8.3	8.1	–	–	7.8	8.0	7.9	–	–
	~~B~~																				
	A																				
	~~B~~																				
	DATE	5/24	5/25	5/25			5/24	5/25	5/26			5/24	5/25	5/26		5/28	5/24	5/25	5/26		5/28
	INITIALS	MTH	MTH	MTH			MTH	MTH	MTH			MTH	MTH	MTH		AMD	MTH	MTH	MTH		AMD

SAMPLE ID	~~CONDUCTIVITY~~ µmhos					SALINITY PPT.					ALKALINITY mg/L CaCO3				
	00	24	48	72	96	00	24	48	72	96	00	24	48	72	96
CONTROL A	26.0					25.0	25.5	25.0	25.0	24.0					
CONTROL B															
A	25.0					25.0	25.5	25.0	25.0	24.0					
B															
A	25.0					25.0	25.5	25.0	25.0	24.0					
B															
A	25.0					25.0	25.5	25.0	–	–					
B															
A	25.0					25.0	25.5	25.0	–	–					
B															
A															
B															
DATE	5/24					5/24	5/25	5/26		5/28					
INITIALS	MTH					MTH	MTH	MTH		AMD					

NOTES ______

AQUA SURVEY, INC.

CULTURE LAB DISTRIBUTION FORM

DATE: 5/24/95

TEST JOB #: Range Finder CLIENT: In house

TEST LOCATION: IN-LAB [X] FIELD [ ]

TEST SPECIES: P. vannamei

TOTAL NUMBER OF ORGANISMS TRANSFERRED: 25

AQUA SURVEY, INC. CULTURE LAB INVESTIGATORS: CD

A. ORGANISMS

1. ASI CULTURE/HOLDING UNIT: 2 76 l tanks 95-0406
2. RECEIVING LOG #: 95-0057 ARO
3. CULTURE LOT #: VOID
4. AGE/SIZE INFORMATION: HD 4/25/95

B. HOLDING [X] CULTURE [ ] WATER PARAMETERS

1. TEMPERATURE: 22.5°C
2. SALINITY: 26.0 ppt
3. WATER SOURCE: Manasquan

C. TRANSFER CUSTODY & TRANSFER

1. LIVESTOCK RELINQUISHMENT DATE: 5/24/95 TIME: 1300 BY: CD
2. LIVESTOCK RECEIVING DATE: 5/24/95 TIME: 1300 BY: MTH
3. CULTURE SUPERVISOR OR LEAD CULTURIST INITIALS: CD

REMARKS:

APPENDIX C

ORGANIC MATTER COMPOSITION DETERMINATION WORKSHEET

Client: Weston Job Number: ____________

Drying Oven: Blue M Temperature: 105 °C Balance #: OHAUS E120

Muffle Furnance: Thermolyne 1500 Temperature: 445 °C

	Sample ID	Crucible Mass (gm) C	Wet Sample + Crucible (gm)	Dry Sample + Crucible (gm) A	% Moisture	Final Sample + Crucible (gm) B	% O.M.
A.	LCP 10-11	11.098	NA	17.446	NA	17.182	~~4.16~~ 4.159
B.	LCP 43	11.187		16.348		16.195	2.965
F ~~A~~	LCP 44	11.249		~~17.~~ 19.428		19.058	4.524
D.	LCP 46	11.575		17.350		17.095	4.416
E	LCP 45	11.366		18.716		18.491	3.061
C. ~~F~~	Ref	12.285		16.103		15.965	3.614
G	SED 35	12.179		19.618		19.489	1.734
H	SED 19-20	11.480		19.857		19.792	0.776
I	SED 36	11.210		19.563		19.533	0.359
J.	SED 17-18	11.760		22.421		22.286	1.266
	Initials/ Date	NMH/ 24 MAY		NMH/ 25 MAY		NMH 26 MAY	NMH 26 MAY

Total Moisture = $\frac{\text{(Wet Sample + Crucible) - (Dry Sample + Crucible)}}{\text{(Wet Sample + Crucible) - Crucible}}$

Total Organic Matter = $\frac{\text{(Wet Sample + Crucible) - (Final Sample + Crucible)}}{\text{(Wet Sample + Crucible) - Crucible}}$ -Total Moisture

For % Moisture or Organic Matter, mulitply total by 100.

$\frac{A-B}{A-C} \times 100$

JN QC 6/1

Standard Method of Test
for

Determination of Organic Content in Soils by Loss on Ignition

AASHTO DESIGNATION: T 267-86

1. SCOPE

1.1 The "Loss on Ignition" method for the determination of organic content is most applicable to those materials identified as peats, organic mucks, and soils containing relatively undecayed or undecomposed vegetative matter or fresh plant materials such as wood, roots, grass or carbonaceous materials such as lignite, coal, etc. This method determines the quantitative oxidation of organic matter in these materials and gives a valid estimate of organic content. The "Wet Combustion" (T 194) method is recommended when it is desired to determine the humus-like easily-oxidized organic material to provide information relating to the suitability of a soil for plant growth.

1.2 The following applies to all specified limits in this standard: For the purposes of determining conformance with these specifications, an observed value or a calculated value shall be rounded off "to the nearest unit" in the last right-hand place of figures used in expressing the limiting value, in accordance with the rounding-off method of AASHTO R 11, Recommended Practice For Indicating Which Places Of Figures Are To Be Considered Significant In Specified Limiting Values.

2. APPARATUS

2.1 *Oven*—Drying oven capable of maintaining temperatures of 110 ± 5 C (230 ± 9 F). Gravity, instead of blower convection may be necessary when drying lightweight material.

2.2 *Balance*—The balance shall conform to AASHTO M 231, Class C.

2.3 *Muffle Furnace*—The furnace shall be capable of maintaining a continuous temperature of 445 ± 10 C (833 ± 18 F) and have a combustion chamber capable of accommodating the designated container and sample. Pyrometer recorder shall indicate temperature while in use.

2.4 *Crucibles or Evaporating Dishes*—High silica, alundum, porcelain or nickel crucibles of 30 to 50 ml capacity or Coors porcelain evaporating dishes approximately 100 mm top diameter.

2.5 *Desiccator*—A desiccator of sufficient size containing an effective desiccant.

2.6 *Containers*—Suitable rustproof metal, porcelain, glass or plastic coated containers.

2.7 *Miscellaneous Supplies*—Asbestos gloves, tongs, spatulas, etc.

3. SAMPLE PREPARATION

3.1 A representative sample weighing at least 100 grams shall be taken from the thoroughly mixed portion of the material passing the 2.00 mm (No. 10) sieve which has been obtained in accordance with AASHTO T 87, Standard Method of Preparing Disturbed Soil Samples.

3.2 Place the sample in a container and dry in the oven at 110 ± 5 C (230 ± 9 F) to constant weight. Remove the sample from the oven, place in the desiccator and allow to cool.

NOTE 1—The sample can be allowed to remain in the oven until ready to proceed with the remainder of the test.

4. IGNITION PROCEDURE

4.1 Select a sample weighing approximately 10 to 40 grams, place into tared crucibles or porcelain evaporating dishes and weigh to the nearest 0.01 gram.

NOTE 2—Sample weights for lightweight materials such as peat may be less than 10 grams but should be of sufficient amount to fill the crucible to at least ¾ depth. A cover may initially be required over the crucible during initial phase of ignition to decrease possibility of sample being "blown out" from the container.

4.2 Place the crucible or dish containing the sample into the muffle furnace for six hours at a temperature of 445 ± 10 C. Remove the sample from the furnace, place into the desiccator and allow to cool.

4.3 Remove the cooled sample from the desiccator and weigh to the nearest 0.01 gram.

5. CALCULATION

5.1 The organic content shall be expressed as a percentage of the mass of the oven dried soil and shall be calculated as follows:

$$\text{Percent Organic Matter} = \frac{A - B}{A - C} \times 100$$

where:

A = Weight of crucible or evaporating dish and oven dried soil, before ignition.
B = Weight of crucible or evaporating dish and dried soil, after ignition.
C = Weight of crucible or evaporating dish, to the nearest 0.01 gram.

5.2 Calculate the percentage of organic content to the nearest 0.1 percent.

A

P

P

E

N

D

I

X

D

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTOD ,ECORD/LAB WORK REQUEST

No: 7., ,3

SHEET NO. 1 OF 1

Project Name LCP
Project Number 03347-040-001-0113-01
RFW Contact Rich Henry Phone: (908) 321-4200

SAMPLE IDENTIFICATION / ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	Toxicity	TOC			
5001	A-H01508	Reference	SD	5/17/95	8	32oz glass/4°C	X				
5002	I01508	Reference	SD	5/17/95	1	4oz glass/4°C		X			
5003	C01510	SED 35	SD	5/18/95	1	4oz glass/4°C		X			
5004	A01546	SED 19-20	SD	5/18/95	1	4oz glass/4°C		X			
5005	B-I01546	SED 19-20	SD	5/18/95	8	32oz glass/4°C	X				
5006	A 01540	SED 36	SD	5/18/95	1	4oz glass/4°C		X			
5007	B-I01540	SED 36	SD	5/18/95	8	32oz glass/4°C	X				
5008	A-H01545	SED 17-18	SD	5/19/95	8	32oz glass/4°C	X				
5009	I 01545	SED 17-18	SD	5/19/95	1	4oz glass/4°C		X			

D-1

Matrix:
SD - Sediment, DS - Drum Solids, DL - Drum Liquids, X - Other
PW - Potable Water, GW - Groundwater, SW - Surface Water, SL - Sludge
S - Soil, W - Water, O - Oil, A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analysis	Richard Henry	5/19/95									

ASI, INC.
SAMPLES RECEIVING FORM

Client: Weston

Shipped Via: Fed Ex

# of Shipping Containers: 2

Type of Shipping Container: Cooler

Custody Seal: Present ☑ Absent ☐ Broken ☐

Condition of Shipping Container: Acceptable ☑ Unacceptable ☐

	Sample I.D.	Type of Container	# of Containers	Condition of Sample†	Temp. °C	Ice+	Type of Sample*
1	LCP Reference	16 oz. glass jar	8	A	13°C	I	SE
2	LPC Sed 19-20	16 oz. glass jar	8	A	13°C	I	SE
3	LPC Reference	16 oz. glass jar	1	U	13°C	I	SE
4	Sed 17-18	16. oz. glass jar	8	A	13°C	I	SE
5	Sed 35	~~80~~ 4 oz. glass jar	1	A	13°C	I	SE
6	Reference	4 oz. glass jar	1	A	13°C	I	SE
7	Sed 17-18	4 oz. glass jar	1	A	13°C	I	SE
8	Sed 36	16 oz. glass jar	8	A	13°C	I	SE
9	Sed 19-2	4 oz. glass jar	1	A	13°C	I	SE
10	Sed 36	4 oz. glass jar	1	A	13°C	I	SE

Notes: (Descrepancies Between Sample Label and COC Record?) No.

In Cold Box A

Opened by: Amanda [illegible]

Date/Time 5/20/95 11:30 am

*
S - Soil
SE - Sediment
SL - Sludge
W - Water
E - Effluent

†
A - Acceptable
U - Unusable or Contaminated

\+
I - Ice
D - Dry Ice
B - Blue Ice
N - None

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTOD IECORD/LAB WORK REQUEST

No: 8_ , 2

SHEET NO. 1 OF 1

Project Name LCP
Project Number 03347-040-001-011-307
RFW Contact Rick Henry Phone (908) 321-4200

SAMPLE IDENTIFICATION — ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	Toxicity	TOC		
5018	A-H24160	LCP 10-11	SD	5/20/95	8	32oz / 4°C	X			
5019	I 24160	LCP 10-11	SD	5/20/95	1	4oz / 4°C		X		
5020	E 24161	LCP 43	SD	5/21/95	1			X		
5021	E 24162	LCP 44	SD					X		
5022	I 24164	LCP 46	SD					X		
5023	E 24163	LCP 45	SD					X		

D-3

Matrix:
SD - Sediment PW - Potable Water S - Soil
DS - Drum Solids GW - Groundwater W - Water
DL - Drum Liquids SW - Surface Water O - Oil
X - Other SL - Sludge A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF
CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
6/analysis	Michael V. Clof	5/22/95									

ASI, INC.
SAMPLES RECEIVING FORM

Client: Neston

Shipped Via: Fed Ex

\# of Shipping Containers: 1

Type of Shipping Container:

Custody Seal Present ☑ Absent ☐ Broken ☐

Condition of Shipping Container: Acceptable ☑ Unacceptable ☐

	Sample I.D.	Type of Container	# of Containers	Condition of Sample†	Temp. °C	Ice+	Type of Sample*
1	5018	32 oz glass	8	A	15°	I	SE
2	5019	4 oz glass	1	A	15°	I	SE
3	5020	"	1	A	15°	I	SE
4	5021	"	1	A	15°	I	SE
5	5022	"	1	A	15°	I	SE
6	5023	"	1	A	15°	I	SE
7							
8							
9							
10							

Notes: (Descrepancies Between Sample Label and COC Record?)

Opened by: Mike Horne

Date/Time: 5/23/95 10:45

*
S - Soil
SE - Sediment
SL - Sludge
W - Water
E - Effluent

†
A - Acceptable
U - Unusable or Contaminated

\+
I - Ice
D - Dry Ice
B - Blue Ice
N - None

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: ~~PSD~~ LCP
Project Number: 03347040001 08301
RFW Contact: Rick Henry Phone: (908) 321-4200

No: 00120

SHEET NO. 1 OF 1

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	TOC			
5032	1050B	LCP 47	SD	5/23/95	1	4oz/4°C	X			
5033	1051B	LCP 48					X			
5034	1052B	LCP 49					X			
5035	1053B	LCP 50					X			
5036	1055B	LCP 51					X			

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/analysis	Rick Henry	5/24/95									

FORM #4

D-5

ASI, INC.
SAMPLES RECEIVING FORM

Client: Weston

Shipped Via: Fed Ex

# of Shipping Containers: 1

Type of Shipping Container: Cooler

Custody Seal Present ☑ Absent ☐ Broken ☐

Condition of Shipping Container: Acceptable ☑ Unacceptable ☐

	Sample I.D.		Type of Container	# of Containers	Condition of Sample†	Temp. °C	Ice+	Type of Sample*
1	5032	LCP 47	8 oz glass	1	A	10°C	I	SE
2	5033	LCP 48	"	"	A	"	I	SE
3	5034	LCP 49	"	"	A	"	I	SE
4	5035	LCP 50	"	"	A	"	I	SE
5	5036	LCP 51	"	"	A	"	I	SE
6								
7								
8								
9								
10								

Notes: (Descrepancies Between Sample Label and COC Record?)

Opened by: Michael J [illegible]

Date/Time 5/25/95 / 10:45

*
S - Soil
SE - Sediment
SL - Sludge
W - Water
E - Effluent

†
A - Acceptable
U - Unusable or Contaminated

+
I - Ice
D - Dry Ice
B - Blue Ice
N - None

Appendix J
LCP Site
Brunswick, GA
April 1997

THE STATE UNIVERSITY OF NEW JERSEY
RUTGERS

UMD NEW JERSEY
University of Medicine and Dentistry of New Jersey
Robert Wood Johnson Medical School

Joint Graduate Program in Toxicology

Environmental and Occupational Health Sciences Institute
681 Frelinghuysen Road • P.O. Box 1179 • Piscataway • New Jersey 08855-1179 • 908/932-3720

To: Nancy Finley
NMFS/EPA
Edison, NJ
908 321-6724 FAX

From: Keith Cooper
EOHSI Rutgers University
Piscataway, New Jersey 08855
908 445-3729 Tel
908 445-0119 FAX

Re: Linden Chemical and Plastic Site

Please find inclosed several articles that I thought you might be interested in reading. The article on New Bedford Harbor has a very nice comparison between the congeners in various matrices:sediment, water, organisms (Fundulus, eel, oyster, shrimp). This paper supports the examination of not only the sediments but also the aquatic organisms. I have also included several of my publications using fish embryos as monitoring tools.

Concerning the samples that we tested the preliminary findings are very incouraging and show that even testing very small amounts of the unextracted sediments does result in increased lesions The samples were tested blind. The results are summarized below.

As I said over the telephone I will be in Canada until the following week. Please leave any information with Brian that you have about the future testing.

Thanks.

Keith

Title: **Evaluation of sediments from the Linden Chemical and Plastic(LCP) site Brunswick, Georgia for toxicity in Japanese medaka embryo.**

Purpose: to see if the sediments cause any embryo-toxicity.

Materials & Methods:

- Eggs were collected on 8/17/95.

- Test solutions were made up of the test sediments and rearing solution as the concentration of 10mg/ml.

- 1ml of the test solutions was added into each 2ml glass vial and one egg was loaded into each of these vials.

- The vials were kept in the incubator at 20°C. The test solutions were changed out at every other day and at the 10th day of exposure, the test solutions in the vials were changed out with aerated rearing solution.

- The eggs were monitored daily until either death or 3 days post hatch.

Group:	N
A: Rearing solution	10
B: J-01508	11
C: K-01540	10
D: K-24160	11
E: J-01545	10
F: K-01546	11

Summary:

No mortality was observed in sediment samples J-01508 and K-01540, and about 10% mortality was occured in sediment samples K-24160, J-01545, and K-01546.

The commonly observed lesions were pericardial edema, head hemorrhage/congestion, and weak heart beat and circulation. Hemorrhage/congestion in caudal area, yolk sphere, and eye was observed. Delayed hatching was occured in all sediment samples.

Lesion	Code
Caudal area hemorrhage/congestion	V18
Low blood flow	T20
Yolk sphere hemorrhage/congestion	R18
Pericardial edema	R41
Eye hemorrhage/congestion	C18
Head hemorrhage/congestion	B18
Tail curved back on itself	V36
Small/hypo eye	C15

SUMMARY OF DATA FROM PRELIMINARY STUDIES

Group	Description	Findings
A	Rearing Solution Control	No lesions were observed. No mortality. No delay in stage development.
B	J-01508 Reference Site	1 minor reversible lesion was observed (Total Lesions 1). No mortality. Compared to the no treatment control there was a delay in hatching but all embryos hatched.
C	K-01540 ~~Sed 17-18~~ location 36	1 minor reversible lesion and 1 lesion involving heart edema (Total Lesions 2). No mortality. Hatching similar to Reference Site.
D	K-24160 Sed 10-11	1 fish had 2 lesion that resulted in death. 4 additional fish had heart edema (Total Lesions 6). 1 of 11 fish dead. Hatching similar to Reference Site.
E	J-01545 Sed 17-18	1 fish had 4 lesions that resulted in death. 3 additional fish had heart edema and hemmorhage (Total Lesions 7). 1 of 10 fish dead. Hatching similar to Reference Site.
F	K-01546 Sed 19-20	1 fish had 5 lesions that resulted in death. 1 additional fish had heart edema (Total Lesions 6). 1 of 11 fish dead. Hatching between no treatment control and Reference site.

Although there are only a few responders, the lesions observed are consistant with lesions observed from dioxins, furans and PCBs. Additional testing needs to be done increasing the concnetration of the pollutants by either extraction and or increasing the amount of sediment. It is always important to test both the un-extracted matrix and the extracted matrices.

The positive control HgCl2 resulted in 40% survival and 80% of the embryos with lesions.

FAX 908~~323~~-7-6-1
(908) 321-6724

Georgia Sediments

Exp. Dt.		TX. Group	% Effluent	N	HATCH	Survival 3-Days	% DEATH	Major # Emb	Major # L/E	Major # L/N	MAJOR Embryo V 18	T 20	R 18	R 41	C 18	B 18	V 36	C 15	minor R 41	minor B 18	Delayed Stage None	Early	Late	% HATCH Total %	Thru d.14	d.15-d.20	d.21+
8/17/95	A	C	10	10	10	0	0	0	0											X			100	50	50	
	B	1	11	11	11	0	0	0	0										1			X	100	9	91	
	C	2	10	10	10	0	0	0	0									1	1			X	100	10	90	
	D	3	11	10	10	1	1	2	.2	1	1							4				X	91	0	100	
	E	4	10	10	9	1	1	4	.4		1	1	1			1		2	1			X	100	0	100	
	F	5	11	10	10	1	1	5	.5		1		1	1	1		1	1				X	91	27	73	
	G																									
	H																									

SUMMARY	None	Non-Dose	Dose
Mortality	X		
LESIONS			
Embryo	X		
Chorion	X		
minor	X		
STAGE	X		
HATCH	X		

A									Mortality
B									LESIONS
C									Embryo
D									Chorion
E									minor
F									
G									STAGE
H									HATCH

A									Mortality
B									LESIONS
C									Embryo
D									Chorion
E									minor
F									
G									STAGE
H									HATCH

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-03-3482

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

Project Name LCP Chemical Brunswick GA
Project Number 03347 040 001011201
RFW Contact [illegible] Phone (908) 321-4200

No: 9593

SHEET NO. 1 OF 1

SAMPLE IDENTIFICATION — ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	Tox Test			
✓	K24160	Sed 10-11	SD	5/18/95	1	8oz glass jar / 4°C	↓			
✓	J01508	Reference	↓	5/17/95	↓	↓	↓			
✓	J01545	Sed 17-18	↓	5/18/95	↓	↓	↓			
✓	K01540	Sed 36	↓	5/18/95	↓	↓	↓			
✓	K01546	Sed 19-20	↓	5/18/95	↓	↓	↓			
✓	00001	Outfall	X	7/13/95	1	5 gal cube container	↓			

Matrix:
SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other Fish
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All analysis	[illegible]	7/18/95	[illegible]	7/18	12:00						

Appendix K
Histopathological Report
LCP Site
Brunswick, GA
April 1997

Virginia Tech
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Virginia-Maryland Regional College of Veterinary Medicine
Department of Biomedical Sciences and Pathobiology
Phase II, Duck Pond Dr. Blacksburg, Virginia 24061-0442
(703) 231-7666 FAX (703) 231-[illegible]

June 15, 1995

RECEIVED
JUN 9
S&A

Mr. John Johnson
Roy F. Weston, Inc.
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
Tele 980-321-4200, 908-321-4248
Fax 908-494-4020

Dear John

I have evaluated the 6 tissues for Project number 3347-040-001-0113 (LCP Chemical) and the report is attached. I have faxed this letter and report today (6/15/95). The hard copy of this letter and report is sent by regular Fed Ex service on this date (6/15/95).

The cost for this work is #300.00. Could you please consider this letter as an invoice for this service, and have payment initiated as soon as possible. Please let me know if there are any questions or issues relative to these tissues, and this project. I look forward to assisting you and Weston in the future. Best regards

Hugo P. Veit, DVM, PhD
Associate Professor, Veterinary Pathology

HPVEaa061595.01

Virginia-Maryland Regional College of Veterinary Medicine
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061
703-231-7666

HISTOPATHOLOGY REPORT

JUN 15,1995

Case No. 95-2199

VET: VEIT, HUGO

OWNER: weston inc.
REAC, EDISON
EDISON, NJ
(908)-321-4200

SPECIES: SMALL OTHER

DATE SAMPLE RECEIVED: JUN 8,1995

HISTORY:
Project number 03347-040-001-0113-01.

HISTOLOGIC DESCRIPTION:
Samples were received 6/5/95, and consisted of 6 jars containing either ovaries or liver, in 10% formalin solution. These containers were identified as samples A01652, A01653, A01654, A01655, A01656 and A01657. The samples were stored in a secure locked room until sectioning, and processed on 6/13/95 and 6/14/95. Evaluation was done by Dr Veit; he was blinded to any details regarding the specimens, except that they were fr turtles, and part of project no. 03347-040-011-0113-01 (LCP Chemical). All tissues were evaluated with a routine hematoxylin and eosin stain.
A01652 - ovary and oviduct - There are normal sections of active ovarian tissue, consisting of well vascularized connective tissue, a few germina cell aggregations and numerous small to large follicles, each having unremarkable histologic features. A remnant of oviduct is noted, and is also unremarkable.
interpretation - normal active ovary, with normal oviduct
A01653 ovary and oviduct - Similar to A01652, except there is prominent melanocytic pigmentation of the connective tissue of both the ovary and oviduct.
interpretation - normal active ovary, with normal oviduct
A01654 ovary and oviduct - Similar to A01652
interpretation - normal active ovary and normal oviduct
A01655 liver - There is focal moderate subcapsular sinusoidal congestion slight to moderate hepatocellular vacuolization, and random numbers of small melanocytic macrophage aggregations scattered throughout the liver parenchyma, along sinusoids.
interpretation - hepatic fatty change, diffuse, mild
A01656 liver - There is mild intraparenchymal fibrosis, scattered rand throughout the liver, with moderate to large aggregations of malanocytic macrophages also scattered throughout the liver.

interpretation - hepatic fibrosis, mild
- melanocytic macrophage nodular hyperplasia, moderate

A01657 liver - There is slight diffuse vacuolization of the hepatocytes, moderate to severe subcapsular sinusoidal congestion, and slight to moderate nodular aggregations of melanocytic macrophages.

interpretation - hepatic fatty change, diffuse, marginal
- melanocytic macrophage nodular hyperplasia, slight

DIAGNOSIS: SEE HISTOLOGIC DESCRIPTION, AND INDIVIDUAL INTERPRETATIONS

COMMENTS:

There were no noticable abnormalities in the ovaries or oviducts. The pigmentation noted in A01653 could have represented an individual variation. Two of the 3 livers (A01655 and A01657) had mild fatty change, which can be caused by a variety of effects, ranging from diet, metabolic/hormonal states, and possibly toxicologic insults. Given the fatty change was so mild, this is likely to be a physiologic state rather than a pathologic state. Melanocytic macrophage aggregations can reflect age (small in young, larger at maturity) and/or exposure to stress (can enlarge or atrophy) or immunostimulation (aggregations enlarge). What is going on with these few turtles is unclear, but the variation appears to be within expected size range. In summary, there was no obvious pathologic lesion or process noted in any of the 6 tissues examined.

Hugo P Veit

Hugo Veit DVM, PhD
Veterinary Pathologist

Roy F. Weston, Inc.
REAC Edison, N.J.
EPA Contract ~~68-03-3482~~ 68-C4-0022

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

LCP Site
03347-040-001-0113-01
Mark Huston Phone (908) 321-4200

No: 9591

SHEET NO 1 OF 1

SAMPLE IDENTIFICATION | ANALYSES REQUESTED

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative	Histo.
	A01652	DD-1	X1	17 May 95	1	4oz glass/10% formalin	✓
	A01653	DD-2	↓	13 May 95	↓	↓	↓
	A01654	DD-4	↓	20 May 95	↓	↓	↓
	A01655	DD-1	X2	17 May 95	↓	↓	↓
	A01656	DD-2	↓	18 May 95	↓	↓	↓
	A01657	DD-4	↓	20 May 95	↓	↓	↓

MV

Matrix:

SD	Sediment	PW	Potable Water	S	Soil
DS	Drum Solids	GW	Groundwater	W	Water
DL	Drum Liquids	SW	Surface Water		
X	Other	SL	Sludge	A	Air

Special Instructions: X1 = Turtle Gonads
X2 = Turtle Liver

FOR SUBCONTRACTING USE ONLY
FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
6/analysis	Michael VanCleef	6/5/95	[signature]	6/5/95	11:00am	6/analysis	[signature]	6/10/95			

WESTON

MANAGERS DESIGNERS/CONSULTANTS

Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
908-321-4200 • Fax 908-494-4021

Virginia-Maryland Regional
College of Veterinary Medicine
Phase II Duckpond Drive
Bl... VA 24061

June 5, 1995

Attn: Dr. Hugo Viet
Project # 3... 040-001 0113, LCP Chemical

As per Weston REAC Purchase Order number 08 32491, dated 06/02/95, please analyze samples according to the following parameters

Analysis/Method	Matrix	# of samples
Turtle livers Histopathology slide preparation and evaluation	livers	3
Turtle ovaries Histopathology slide preparation and evaluation	ovaries	3
Data package as per attached Deliverables Requirements		

Samples are expected to arrive at your laboratory on June 5, 1995. The slides should have only one animal and one tissue per slide. The complete report must include a detailed description of each slide. The complete report ... WESTON REAC by June 19, 1995.

Should any questions or problems arise concerning this project, please call John Johnson at (908) 321-4248 or fax to (908) 494-4020. Any contractual question, please call Cindy Snyder at (908) 321-4296. Thank you.

Sincerely,

George Armstrong
Data Validation and Report Writing Group Leader
Roy F. Weston, Inc. REAC Project

GA: Attachments

Post-it™ brand fax transmittal memo 7671 | # of pages ▸

To Dr. Viet	From John Johnson
Co. Virginia Vet. Medicine	Co.
Dept.	Phone #
Fax # (703) 231-7367	Fax #

cc: R. Singhvi | V. Kansal | C. Snyder
M. Sprenger | Subcontracting File | P. Kim
0113 non/mem 9506\sub\0113Con2 | B. Lewan | G. Armstrong

Slides Arrived by separate package, B. Lewan

RAW DATA LOG IN SHEET

SITE: LCP Chemical

WA#: 0113

DATA PACKAGE #: E419

LAB: ARUP

CHAIN OF CUSTODY #'S 00717, 00718
00629

ANALYSIS:

36 Histopathological Tissue Rep

NUMBER OF SAMPLES: 28 Clapper
8 Turtles

MATRIX:

DATA PACKAGE RECEIVED BY: EI	DATE: 10-16-95
ASSIGNED QC DATA REVIEWER:	
QC REVIEW START DATE:	
QC REVIEW COMPLETION DATE:	
HOURS CHARGED - QC DATA REVIEWER:	

DATA SUMMARY INFORMATION

METHOD ENCLOSED:	YES ____	NO ____	
SAMPLE RESULTS:	USE ORIGINALS ____	SEE CHECK RECORDS ____	NA ____
SURROGATE RESULTS:	USE ORIGINALS ____	SEE CHECK RECORDS ____	NA ____
MS/MSD:	USE ORIGINALS ____	SEE CHECK RECORDS ____	NA ____
DUPLICATE:	USE ORIGINALS ____	SEE CHECK RECORDS ____	NA ____
BS/BSD:	USE ORIGINALS ____	SEE CHECK RECORDS ____	NA ____
LAB. CONT. SAMPLE:	USE ORIGINALS ____	SEE CHECK RECORDS ____	NA ____
MS ONLY:	USE ORIGINALS ____	SEE CHECK RECORDS ____	NA ____
CALIBRATION:	USE ORIGINALS ____	SEE CHECK RECORDS ____	NA ____
CHAINS OF CUSTODY:	OK ____	PROBLEMS ____	

ANY COMMENTS FOR THE FINAL REPORT CASE NARRATIVE

REVISION 8-19-95

* Copies given to M Huston per [illegible]

LAB DATABASE INFORMATION FORM

Your feedback on this form **IS REQUIRED** for maintenance of a laboratory database. Fill in performance evaluation area and additional comments regarding this data package. **HAND FORM BACK** to John Johnson

Site: LCP CHEMICAL Subcontract Laboratory: ARUP

#03347-040-001- 0113 Lab's Job Number: VR 95-000953

Date Due: 10/11/95 PO #: 08-51050

Date Received: 10/16/95 Payment Approval (Yes/No): ____

/ Type Samples / Analyses Requested:

00717, 00718, 00629 36 HISTOPATHOLOGICAL TISSUE PREP

28 CLAPPER 8 TURTLES

SLIDES ARRIVED BY SEPARATE PACKAGE, ASK BETINA LEWAN)

COMPLETENESS CHECK:

✓ Case Narrative ____
__ Checklist for Analytes NA
__ Sample Identification Index ____
__ All Analyses Performed ____
__ QA/QC Tables ____

✓ Legible Copies ____
__ Raw Data NA
__ Analytical Procedures NA
__ Results Tables ____
__ Chain of Custody ____

PERFORMANCE EVALUATION (Please Fill in with a Number from 1 through 10)

QA/QC Reviewer
Completeness ____ See Below
Quality ____
Organization ____
Procedures ____
Responsiveness ____

Lab Engagement
Timeliness 5 (Subtract 1 for each work day late)
Follow-up 10 (Subtract 1 for each call to get same information)
Handling 10 (Subtract 1 for every 2 days it takes to get information)

signature date

John Johnson 10/16/95
signature date

COMMENTS:

Completeness = Subtract 1 for each portion missing (ie check records,COC,continuing calibration)
Quality = Subtract 1 for each quality issue (ie page quality, report accuracy, readability,)
Organization,Procedures,Responsiveness, rate as follows
10 = Everything is present, no questions at all to the lab,easy to understand and QA
8 = Very minor questions,answers are forth coming within a day or two by phone or fax.
6 = Many questions,a letter to the lab is necessary,answered within a week, integrity of data good.
2 = Data suspect, laboratory seems uncooperative in responding,data cannot be verified,data integrity poor.

NAME/SPECIES: WESTON, TURTLE
REQUESTING DR: WESTON
ANIMAL ID: VR953
UNK

WESTON/REAC PROJECT
2890 WOODBRIDGE AVE #209
EDISON, NJ 08837-3679

ARP ID#: (06727)000-62-2521
RECEIVED: 03OCT95
PRINTED: 12OCT95 1503

VETERINARY PATHOLOGY

CASE#: VR-95-000953

MICROSCOPIC

Animal Reference Pathology
500 Chipeta Way
Salt Lake City, Utah 84108
800-426-2099

VR-95-953

Study #3347-040-001-0113, LCP Chemical

Slide A04952
Liver, H & E - The liver tissue demonstrates moderate autolysis with a few collections of inflammatory cells in the portal triad areas. The inflammatory cells include mononuclear cells. Minimal fibrotic change is identified. There is a local granulomatous reaction in the liver with multinucleated giant cells and surrounded by granulation tissue. Other multifocal granulomas are present. Specific other changes are not identified.

Slide A04953
Brain, H & E - The brain tissue is mildly autolyzed. Freezing artifact is present.

Slide A04953
Brain, Luxol Fast Blue Stain - This stain is staining myelin and supports areas of myelin formation. There are areas of irregular myelinization. Specific other alteration is not identified.

Slide A04954
Liver, H & E - This liver tissue is mildly to moderately autolyzed with multifocal areas of increased cellularity in some of the portal triad areas. These foci of increased cellularity appear to be collections of lymphocytes with small granulomata. Specific other inflammation or change is not identified.

Slide A04955
Brain, H & E - This tissue demonstrates freezing artifact and mild autolysis. Specific alterations of the brain tissue were not identified by routine histologic evaluation.

Slide A04955

Continued on Next Page...

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VETERINARY PATHOLOGY

CASE#: VR-95-000953

MICROSCOPIC

Brain, Luxol Fast Blue Stain - The special stain demonstrates the myelin sheaths. The myelin tracts are scattered irregularly through the grey matter. Specific change is not identified.

Slide A04956
Liver, H & E - The liver tissue is mildly autolyzed with multifocal collections of lymphoid cells in portal triad areas. The lymphoid cells are collecting irregularly with fibrosis. Edema and congestion are part of the reaction. Specific alteration or degeneration cannot be identified. There is no evidence of specific toxicity.

Slide A04957
Brain, H & E - There is evidence of freezing artifact with mild autolysis. Specific inflammatory or toxic changes are not identified.

Slide A04957
Brain, Luxol Fast Blue Stain - Good staining of the myelin sheaths has occurred in this section. The myelin appears to be demonstrating a uniform pattern of stain throughout the brain tissue.

Slide A04958
Liver, H & E - This section of liver tissue demonstrates multifocal collections of lymphoid cells and chronic inflammatory cells in the portal triad areas. Mild hepatic autolysis has occurred in this tissue. Specific other changes or evidence of toxic change cannot be identified.

Slide A04959
Brain, H & E - The brain tissue demonstrates mild freezing artifact and very mild autolysis. No significant alteration of the tissues was identified.

Slide A04959
Brain, Luxol Fast Blue Stain - The luxol fast blue supports myelin staining with no evidence of specific change. Specific degenerative change is not confirmed with the special stain.

Slide A04960
Liver, H & E - The liver tissue demonstrates mild autolysis with mild lymphocytic cholangiohepatitis in several parts of the portal triad areas. Specific infection or degeneration is not identified.

Continued on Next Page...

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VETERINARY PATHOLOGY

CASE#: VR-95-000953

MICROSCOPIC

Slide A04961
Brain, H & E - There are areas of freezing artifact clefting with mild autolysis in this brain tissue. Specific other change is not identified.

Slide A04961
Brain, Luxol Fast Blue Stain - This section of brain tissue demonstrates relatively uniform staining myelin in several parts of the brain. The uniform staining is scattered throughout white tracks in the brain tissue.

Slide A04962
Liver, H & E - There is mild autolysis of the hepatic tissue. Multifocal areas of chronic inflammation are present in the portal triad areas. These areas of inflammation include fibrosis and collections of lymphocytes. Specific other inflammatory elements are secondary. Degeneration and inflammation are occurring secondarily. Specific other changes are not part of the reaction. No evidence of specific toxicity can be identified in the liver parenchyma.

Slide A04963
Brain, H & E - These sections of brain demonstrate acute congestion with focal areas of hemorrhage. The hemorrhage may be the result of the collection procedure and not the result of other significant change.

Slide A04963
Brain, Luxol Fast Blue Stain - This section of LFB demonstrates layered myelin sheaths with staining similar to the usual pattern of stain. Some irregularity of the myelin sheaths has occurred. Other significant changes cannot be identified.

Slide A04964
Liver, H & E - This section of liver tissue demonstrates mild autolysis. Multifocal collections of lymphoid cells and other inflammatory cells are present in the portal triad areas. Focal areas of fibrosis are present. Specific other change is not confirmed in the tissue. Inflammation is minimal but chronic.

Slide A04965
Brain, H & E - This brain tissue demonstrates freezing artifact and mild autolysis.

Slide A04965

Continued on Next Page...

VETERINARY PATHOLOGY

CASE#: VR-95-000953

MICROSCOPIC

Brain, Luxol Fast Blue Stain - The myelin sheaths are stained in a uniform pattern consistent with those described in the other birds. Some irregularity is present but some of this change may be the result of freezing artifact or normal myelin in the bird.

Slide B03866
Brain, H & E - This section of brain demonstrates a good collection of brain tissue which appears to be well preserved. Minimal autolysis can be identified. No evidence of specific inflammation or toxicity is identified.

Slide B03866
Brain, Luxol Fast Blue Stain - The luxol fast blue demonstrates uniform staining of the white matter. There are focal areas of separation of the myelin fibers. This separation may be the result of myelin degeneration or it may be due to handling. The myelin sheaths, in general, are layered in an appropriate pattern.

Slide B03867
Liver, H & E - There are focal areas of mild autolysis on the tip of the liver tissue. No freezing artifact was identified. There is mild congestion of the liver tissue with a few collections of lymphocytes and plasma cells and focal granulomata. This reaction includes a few heterophils. These reactions are irregularly scattered throughout the liver parenchyma. Other specific changes are not present.

Slide B03868
Brain, H & E - This section of brain tissue demonstrates no evidence of freezing artifact and the brain tissue is slightly congested. Specific other changes or inflammation cannot be identified. Neuronal tissue is present in a uniform pattern. Specific other change is not visualized.

Slide B03868
Brain, Luxol Fast Blue Stain - This section demonstrates well stained myelin sheaths in a prominently layered pattern. Degenerate debris is occurring secondarily. No specific inflammation is identified. The myelin is layered in an appropriate pattern.

Slide B03869
Liver, H & E - This section of liver tissue is congested. There are multifocal collections of lymphoid cells aggregated irregularly in the hepatic tissue

Continued on Next Page...

VETERINARY PATHOLOGY

CASE#: VR-95-000953

MICROSCOPIC

particularly around the portal triad areas. Specific other inflammation or change is not identified.

Slide B03870
Brain, H & E - This section of brain tissue demonstrates no evidence of freezing artifact. There is acute congestion. Focal areas of vacuolated white matter are visualized in some of the brain stem. Focal areas of status spongiosis are suggested in the cerebellum. The specific source or cause for this status spongiosis is not identified.

Slide B03870
Brain, Luxol Fast Blue Stain - The LFB stain confirms the vacuolization of the myelin. The vacuolization is somewhat more severe and irregular than identified in any other slides. Specific other changes are not identified. Inflammation is not identified.

Slide B03871
Liver, H & E - This section of liver is acutely congested with multifocal collections of lymphoid cells scattered throughout the hepatic parenchyma. Acute congestion has occurred in the hepatic tissue. Specific other inflammation or change is not identified. Mild vacuolization has occurred in focal areas but it is minimal.

Slide B05187
Liver, H & E - This liver tissue is moderately autolyzed. Specific other inflammation or change is not identified.

Slide B05188
Brain, H & E - This section of brain tissue demonstrates good brain structure with focal areas of vacuolization of the white matter. Some of this vacuolization may be the result of artifact. Specific inflammation is not identified and there is no evidence of freezing artifact.

Slide B05188
Brain, Luxol Fast Blue Stain - This section of brain demonstrates several layers of myelin material. No evidence of extensive vacuolization of the white matter could be identified. Specific other change is not identified. There are focal areas of mild vacuolization but this may be a result of sectioning artifact and not a result of specific change.

Continued on Next Page...

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VETERINARY PATHOLOGY

CASE#: VR-95-000953

MICROSCOPIC

Slide B05189
Brain, H & E - This section of brain demonstrates good organized brain tissue. No evidence of specific freezing artifact can be identified. There is very mild autolysis in the brain tissue but it is very mild. Some minimal vacuolization of myelin sheaths can be identified.

Slide B05189
Brain, Luxol Fast Blue Stain - This stain demonstrates layered myelin sheaths throughout the brain tissue. Other specific changes or alterations are not identified. Slight hyalinization of the white matter has occurred in several areas mainly as a result of sectioning change and not the result of specific vacuolization of myelin. Some of this change may also be the result of autolysis of a non-specific nature.

Slide B05190
Liver, H & E - This tissue is slightly autolyzed with acute congestion. No specific inflammation or change is identified in this liver tissue.

Slide B05191
Brain, H & E - This section of brain tissue demonstrates mild to moderate autolysis with no evidence of freezing artifact. Scattered areas of sectioning artifact are present in the tissue but specific other infection or degeneration of toxicity cannot be identified.

Slide B05191
Brain, Luxol Fast Blue - This section of brain tissue demonstrates some staining of the myelin sheaths irregularly scattered throughout the brain tissue. The myelin sheaths are stained in an appropriate pattern in this particular section of brain.

Slide B05192
Liver, H & E- This liver tissue is moderately autolyzed with acute congestion. A few inflammatory cells such as lymphocytes and plasma cells are collected around the portal triad areas with fibrosis. This type of reaction supports a mild multifocal area of chronic inflammation. Specific other change is not identified in the liver tissue.

Slide B05193
Brain, H & E - This section of brain demonstrates mild to moderate autolysis with acute congestion.

Continued on Next Page...

VETERINARY PATHOLOGY

CASE#: VR-95-000953

MICROSCOPIC

Slide B05193
Brain, Luxol Fast Blue - The myelin is stained in a similar manner as other birds in this study. Specific other change or alteration is not identified by this stain.

Slide B05194
Liver, H & E - This tissue is demonstrating mild autolysis with multifocal lymphocytic accumulation around portal triad areas and around vascular elements. Specific inflammatory changes or degenerative changes or toxicity is not identified.

COMMENT:

There are multifocal granulomata in the livers of many of the rails. This would suggest some type of parasitic infiltration through the liver or past bacterial infection. A few collections of lymphocytes are present in the portal triad areas. Specific evidence of toxicity is not identified in the liver tissue. Some of the brains demonstrate freezing artifact with mild autolysis. The luxol fast blue stain is slightly irregular in some of the birds with a few enlarged structures but by routine H&E stain, no abnormalities were identified. The myelin staining in the brain tissue was consistent in all of the birds. Whether the myelin staining variation is real or whether this change is a function of the freezing artifact or the type of myelin staining expected in the normal rail will require evaluation of normal birds.

TURTLES

Slide B04966
Brain, H & E - There is evidence of freezing artifact in this tissue with altered tissue. Degenerate debris is a secondary part of the collection.

Slide B04966
Brain, H & E - This stain demonstrates good layers of myelin and normal layering of myelin throughout this section of brain. Specific other change is not identified.

Continued on Next Page...

VETERINARY PATHOLOGY

CASE#: VR-95-000953

MICROSCOPIC

Slide B04967
Liver, H & E - This tissue demonstrates normal architecture with normal aggregates of pigment. Specific inflammation or degeneration is not identified.

Slide B04968
Ovary and Uterus, H & E - This tissue is mild to moderately autolyzed with degeneration. Specific other inflammatory changes or degenerative processes are not identified. Ovarian tissue appears to be functional in this collection.

Slide B04969
Brain, H & E - These sections of brain demonstrate freezing artifact with mild autolysis. No specific degeneration is identified.

Slide B04969
Brain, Luxol Fast Blue - This stain demonstrates the layering of myelin in a normal pattern throughout the sections of brain tissue. Specific degenerative change or infection or toxic change cannot be identified.

Slide B04970
Liver, H & E - This section of liver demonstrates mild autolysis and pigmentation of the liver. Some vacuolization of hepatocytes is present. Specific other change is not identified.

Slide B04971
Ovary and Uterus, H & E - These sections of ovary demonstrate functional ovarian tissue and uterine tissue. Specific alteration to support a toxic problem cannot be identified. Mild autolysis is present in the tissue but no specific degeneration is identified.

Slide B04972
Brain, H & E - This brain tissue demonstrates mild autolysis with minimal evidence of freezing artifact. Specific degenerative changes or inflammatory changes cannot be identified. Some degenerative changes as a result of a collection procedure are present. Other specific changes cannot be identified.

Slide B04972
Brain, Luxol Fast Blue - This stain demonstrates myelin stain with layered

Continued on Next Page...

10134026

NAME/SPECIES: WESTON, TURTLE
REQUESTING DR: WESTON
ANIMAL ID: VR953
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WESTON/REAC PROJECT
2890 WOODBRIDGE AVE #209
EDISON, NJ 08837-3679

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PAGE: 9

VETERINARY PATHOLOGY

CASE#: VR-95-000953

MICROSCOPIC

myelin in appropriate patterns. Specific degenerative changes are not identified in the myelin stain.

Slide B04973
Liver, H & E - The liver tissue demonstrates mild hepatocellular vacuolization. Some pigmentation has occurred in the liver tissue. Other specific changes are not identified.

COMMENT:

There is evidence of freezing artifact in the turtle tissues. No evidence of toxicity, infection or specific degeneration could be identified in the liver or brain. The myelin layering appears to be appropriate in the brain tissues available to evaluate. Specific toxicity or specific uniform degeneration is not identified in any of this tissue. The samples appear to be relatively normal and preserved appropriately with mild autolysis.

DIAGNOSIS

L. D. MCGILL, DVM, PH. D. DIPLOMATE, ACVP.
10/11/95
(LDM/LDM) Diagnosis by: L. D. McGill, D.V.M., Ph.D., DACVP

Verified by: L. D. McGill, D.V.M., Ph.D., DACVP
Veterinary Pathologist
electronic signature

For Histopathology Consultation Call: 1-800-426-2099

ANIMAL REFERENCE PATHOLOGY

CLIENT Weston
STUDY # 3347-040-001-0113, LCP Chemical
ACC # VR 953

BLOCKS 36 Blocks
SLIDES 36 H&E's + 17 LFB's + Co.
WET TISSUE 36 bottles

DATE RECEIVED 9/20/95 DATE COMPLETED 9/27/95

ACC#	ANIMAL#	SITE	LOG	GROSS	PROCESS	EMBED	CUT	STAIN	LABEL	QA
VR953	A04952	Liver	9/20 OB	9/20 P.H	9/20 PH	9/21 HW	9/21 OB	9/21 OB	9/22 OB	9/27 OB
	A04953	Brain								
	A04954	Liver								
	A04955	Brain								
	A04956	Liver								
	A04957	Brain								
	A04958	Liver								
	A04959	Brain								
	A04960	Liver								
	A04961	Brain								
	A04962	Liver								
	A04963	Brain								
	A04964	Liver								
	A04965	Brain								
	B03866	Brain								
	B03867	Liver								
	B03868	Brain								
	B03869	Liver								
	B03870	Brain								
	B03871	Liver								
	B05187	Liver								
	B05188	Brain								
	B05189	Brain								
	B05190	Liver								
	B05191	Brain								
	B05192	Liver								
	B05193	Brain								
	B05194	Liver								
	B04966	Brain								
	B04967	Liver								
	B04968	Gonad								
	B04969	Brain								
	B04970	Liver								
	B04971	Gonad								

COMMENTS

ANIMAL REFERENCE PATHOLOGY

CLIENT ______
STUDY # ______
ACC # ______

BLOCKS ______
SLIDES ______
WET TISSUE ______

DATE RECEIVED | DATE COMPLETED

ARP#	ANIMAL#	SITE	LOG	GROSS	PROCESS	EMBED	CUT	STAIN	LABEL	[illegible]
VR953	B04972	Brain.	9/20 DH	9/20 P.H.	9/20 PH	9/21 HLD	9/21 DH	9/21 DA	9/22 DH	9/27 DH
↓	B04973	Liver	↓	↓		"	"	"	"	↓

COMMENTS: ______

REAC, [illegible]son, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CH[illegible] OF CUSTODY RECORD

Project Name LCP Chemical Site
Project Number 03347-040-001-0113-01
REW Contact John Johnson Phone (908) 321-4280

No 00717

SHEET NO 2 OF 3

Sample Identification / **Analyses Requested**

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	histo.			
✓	B03866	Rail #1, LCP	X2	12JUL95	1	8oz glass/10% formalin	✓			
✓	B03867	↓	X1							
✓	B03868	Rail #2, LCP	X2							
✓	B03869	↓	X1	↓						
✓	B03870	Rail #3, LCP	X2	13JUL95						
✓	B03871	↓	X1	↓		↓				
✓	B05188	Rail #4, LCP	X2	18JUL95		4oz glass/10% formalin				
✓	B05187	↓	X1							
✓	B05189	Rail #5, LCP	X2							
✓	B05190	↓	X1							
✓	B05191	Rail #6, LCP	X2							
✓	B05192	↓	X1							
✓	B05193	Rail #7, LCP	X2							
✓	B05194	↓	X1	↓	↓	↓	↓			

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions

X1 = Clapper Rail liver
X2 = Clapper Rail brain

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
14/analyses	Michael [illegible]	9/13/95									
14/analyses	[illegible]	9/12/95									

FORM #4

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name UCP Chemical Site
Project Number 03347-040-01-0113-01
RFW Contact John Johnson Phone (908) 321-4200

No: 00718

SHEET NO 3 OF 3

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	histo.			
✓	B04966	BD-1, ♀	X1	July 1995	1	40ml vial/10% formalin	✓			
✓	B04967	↓	X2	↓	↓	↓	↓			
✓	B04968	↓	X3	↓	↓	↓	↓			
✓	B04969	NTD-1, ♀	X1	↓	↓	↓	↓			
✓	B04970	↓	X2	↓	↓	↓	↓			
✓	B04971	↓	X3	↓	↓	↓	↓			
✓	B04972	NTD-2, ~~[illegible]~~ ♂	X1	↓	↓	↓	↓			
✓	B04973	↓	X2	↓	↓	↓	↓			

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions
X1 = turtle brain
X2 = turtle liver
X3 = turtle gonad

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
8/analysis	Michael [illegible]	9/8/95									
8/analysis	[illegible]	10/12/95									

FORM #4 8/94

REAC, E..son, NJ
(908) 321 4200
EPA Contract 68-C4-0022

CHA.. OF CUSTODY RECORD

Project Name: LCP Chemical Site
Project Number: 03347-040-001-0113-01
REAC Contact: John Johnson   Phone (908) 321-4200

No 00629

SHEET NO 1 OF 3

Sample Identification / **Analyses Requested**

REAC #	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	histo.			
✓	A04952	Rail #8, Ref	X1	15 Aug 95	1	4oz glass/10% formalin	✓			
✓	A04953	↓	X2							
✓	A04954	Rail #9, Ref	X1							
✓	A04955	↓	X2							
✓	A04956	Rail #10, Ref	X1							
✓	A04957	↓	X2							
✓	A04958	Rail #11, Ref	X1							
✓	A04959	↓	X2							
✓	A04960	Rail #12, Ref	X1							
✓	A04961	↓	X2							
✓	A04962	Rail #13, Ref	X1							
✓	A04963	↓	X2							
✓	A04964	Rail #14, Ref	X1							
✓	A04965	↓	X2	↓	↓	↓	↓			

MW

Matrix:

SD - Sediment	DS - Drum Solids	DL - Drum Liquids	X - Other		
PW - Potable Water	GW - Groundwater	SW - Surface Water	SL - Sludge		
S - Soil	W - Water	O - Oil	A - Air		

Special Instructions
X1 = Clapper rail liver
X2 = Clapper rail brain

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
14/analysis	Michael [illegible]	9/18/95									
14/analysis	[illegible]	10/7/95									

FORM #4 8/94

* U.S. GPO 1994-383-014

ask - little brain
sampled can they
make a determin.

Little brain
14 End floor

28 August 1995

To: Ms. Nancy Finley

From: Dr. Pat Klein

Subject: Pathology samples for PCB and Mercury toxicity

Nancy,

Pardon the sluggish response....mondays are always hectic, but even more so when you have just returned from two weeks of business travel (as I have!).... Here are my suggestions for collecting appropriate pathology samples, and any special histopath stains:

PCB toxicity

lymphatic tissue atrophy:
- bursa of Fabricius
- spleen
- thymus
- lymph nodes

liver necrosis, fibrosis, fatty change
- biliary hyperplasia
- uv. fluorescence of liver tissue (increased porphyrins)

skin lesions (chloracne-type)

hydropericardium
- heart
- pericardial sac

thyroid gland degeneration, colloid depletion
- thyroid gland

ovarian atresis
- ovary

renal necrosis (?) (seen in TCDD toxicity)
- kidneys

multi-organ hemorrhages
- brain, heart, liver, adrenal glands, gastrointestinal tract

No particular histopathology stains other than H&E to document these changes. The Oil-Red-O for fat requires fresh frozen tissue preparation (as in hepatic fatty change).

or Sudan III

Mercury toxicity:

Lots of different forms of mercury...organic and inorganic... the methyl- and ethylmercury are the most toxic, while the aromatic forms are less toxic than the alkyls but more toxic than the elemental salts. Inorganic mercury is absorbed from the lungs and GI tract with highest concentrations found in liver and kidney tissues. Organic mercury is absorbed from the lung, GI tract and through the skin. Methylmercury accumulates in the brain.

Encephalomalacia, cerebral and cerebellar atrophy, myelin degeneration, gliosis
    cerebrum, cerebellum, thalamus, brain stem

myelin sheath and axonal degeneration
    spinal cord, peripheral nerves (possible)

bronchitis
    lungs

hepatic hydropic degeneration
    liver

renal tubular necrosis
    kidneys

hemorrhagic gastritis (chemical caustic ingestion)
    stomach

necrotic/ hemorrhagic ileocolitis and typhlitis
    ileum, cecum, colon

Not all pathologic changes may be present. Many of these changes have been reported in domestic mammals.

Special histopathology stains: Luxol-fast-blue for changes in myelin (brain). Check with AFIP (Armed Forces Institute of Pathology) for any additional CNS stains.

Best of luck in your project...I have included a few xeroxed pages from Norman Cheville's, Cell Pathology (2nd ed.) for your information on mercury toxicity in birds. Do not hesitate to call me if you have any further questions.

Regards,

pat klein pk

CHAPTER 9

ng marijuana that has
t production. Acute
large dose leads to
eurologic signs, and
in liver and kidney.
non, here the target
s of route of entry.
progressive fibrosis
g exhalation of para-
piratory elimination
umonia).

herbicides, which
ls, include a large
phatic esters. Ex-
and propham to rats
little other evidence
such as diuron and
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pounds promote car-
nazine and atrazine,
lightly toxic for cat-
es doses. Amitrol is
a potent antithyroid
t depression of thy-
oited for use near

which are nontoxic
subtle teratogenic
herbicide TOK
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ables. In laboratory
egnant females pro-
us. One of these is
nds, which bathe the
hyroid effect, since
correlated with and
es

LUTANTS

drocarbons
Polychlorinated bi-
ulating materials in
per manufacturing.
Highly stable, they
specially in water
found to contain up
pophilic nature and
a variety of disease
duction, estrogenic
and porphyrogenic
PCBs with animal
ity but passes these
gh accumulation in

is associated with
development, and
follicular cells and

Norman Cheville Cell Pathology 2nd Edition

lead to altered thyroxin metabolism and reduced serum levels of thyroxine and triiodothyronine. Experimentally, there is enlargement of thyroid glands with accumulation of colloid droplets and large abnormal lysosomes in follicular cells (Hill and Capen 1980). In addition, PCBs induce hepatic SER enzymes, including thyroxine [illegible] glucuronyltransferase, and there is increased conjugation and [illegible] of thyroxine glucuronide in bile.

CHLOROPHENOLS. Hexachlorophene was used as an antibacterial agent in soaps and deodorants in the 1970s and, as it persists in the environment, was detected in surface waters as high as 48 ppb. Hexachlorophene, which [illegible], is associated with [illegible] in myelin, in both man and animals. It causes swelling and vacuolation of both central and peripheral myelin by splitting [illegible] myelin lamellae at intraperiod lines (which represent apposition of extracellular portions of the [illegible]). [illegible] athy due to d[illegible] of disk membranes of photoreceptor outer segments [illegible] hexachloroph[illegible] natural disease (Towfighi et al. 1974).

DIOXIN ISOMERS. Polychlorinated dibenzodioxins are formed during synthesis of polychlorinated phenols. They poison [illegible] as contaminants of chemical products and in industrial [illegible]. In 1976 an industrial accident in Italy released a chemical cloud of dioxins and other compounds over a wide area that, despite evacuation, [illegible] and human [illegible] (TCDD) the [illegible] animal damage [illegible] dioxin

Pentachl[illegible] liver cide and de[illegible] human and animal [illegible] widely used pesti- taminated [illegible] detected in the death of millions of chickens [illegible] result of con- United State[illegible] associated with in animal fat [illegible] northeastern from hides [illegible] components was due not [illegible] had been derived technical gr[illegible] However, toxicity duction of d[illegible] in the tie induced [illegible] Repro- and villous h[illegible] disease in cat- (McConnell et al. [illegible]) atrophy [illegible] mucosa

Metals. Ma[illegible] that dissol[illegible] soluble facilitate the[illegible] absorption is [illegible] when ingest[illegible] Gastro[illegible] than during feeding [illegible] affected by [illegible] phosphate [illegible] high[illegible] because

soluble lead phosphate is formed. Pulmonary absorption is poor with insoluble compounds because they are cleared rapidly in the upper airways. Metals existing as alkyl compounds where metallic ions are firmly bonded to carbon pass readily across lipid membranes and unaltered into the circulation. Thus organometallic compounds such as methyl mercury and tetraethyl lead are highly toxic.

LEAD. Lead (Pb) toxicity occurs by ingestion of flaking Pb-based paints or ingestion of contaminated grasses near lead smelters. It is manifested by a variety of gastrointestinal, hematologic, and nervous disorders. Early clinical signs include weakness, periodic convulsions, and anemia; these may progress to paralysis and death. Anemia is due both to suppression of hemoglobin production and to reduction of erythrocyte life span. Defects are produced in mitochondrial pathways of uroporphyrinogen synthesis. Pb also binds to mitochondrial membranes and suppresses both oxidative phosphorylation and the citric acid cycle. Other systems affected by Pb, less life threatening, are skin, kidney, and peripheral nervous system.

CNS lesions are primarily vascular and consist of scattered hemorrhages (usually perivascular), degenerative endothelial changes, and necrosis of small vessels. Fibrin exudation and capillary endothelial proliferation also occur. Focal loss of myelin is nearly always seen in fatal cases, and laminar necrosis is sometimes found (Clasen et al. 1974).

Eosinophilic, acid-fast inclusions occur in nuclei of renal proximal convoluted tubules and sometimes in hepatocytes. Composed of Pb-protein complexes with a dense central core and an outer fibrillary zone (Goyer and Wilson 1975), they probably are a nuclear storage site for Pb. Hepatic accumulation of Pb alters Kupffer cell phagocytic function and potentiates the effects of other toxins arriving in the portal vein, especially endotoxin (Cook et al. 1981). Damage to the renal tubule leads to inhibition of reabsorption of glucose, amino acids, and other substances in the glomerular filtrate.

$\boxed{\text{MERCURY.}}$ There are three toxic forms of mercury. Elemental mercury (Hg) is an inhaled metal that is distributed to the alveolar wall and is associated with chronic toxicity. Inorganic mercury (Hg^{++}, as in $HgCl_2$) can be highly soluble and [illegible] highly toxic when ingested. Organic mercury [illegible] ethyl mercury, and the alkyl mercury [illegible] forms salts with acids (chlorides and [illegible]) and reacts with cell ligands such as [illegible] groups to complex with and pass through [illegible]. Organic mercury in the environment [illegible] the most important animal metallic [illegible]

[illegible] disappearance of seed-eating birds and their [illegible] was observed in the 1950s and

next page →

large amounts of mercury were discovered in dead and intoxicated birds. Mercurials for seed disinfection in agriculture were implicated, especially methyl mercury. Studies of birds from museum collections showed increasing mercury in feathers from about 1890 onward. Methyl mercury is readily absorbed by and stable within the bird. It accumulates in most organs, with preference for kidney, liver, and oviduct. There is an intense concentration in egg albumin, and the female thereby excretes methyl mercury faster than the male. This affects embryonal development and leads to poor hatchability of the egg (Fig. 9.14). Injection of methyl mercury leads to slowly developing high levels in the brain. In birds, mercurials other than the methylated forms do not show this brain concentration, are more rapidly excreted, and tend to accumulate in yolk rather than egg white (Backström 1969).

Industrial and agricultural uses of mercurials lead to contamination of the aquatic environment. Freshwater fish become contaminated, develop gill disease, and die. They are responsible for toxicity in birds and humans feeding on fish. In Minimata, Japan, a large number of people suffered severe acute neurologic disease from eating fish contaminated with effluents from the paper industry.

The pathogenesis of mercury neurotoxicity involves alteration of the blood-brain barrier, suppression of synaptic transmission, and inhibition of protein synthesis in neurons. Mercury is a potent inhibitor of sulfhydryl-rich proteins and forms cross-links with plasma membrane proteins. This suppresses membrane-associated enzymes, especially ATPases of the sodium-potassium pumps. These leaky membranes lead to endothelial swelling, increased capillary permeability, and edema of the neuropil.

Astrocyte foot processes abutting capillaries are markedly swollen in acute mercury toxicity (Ware et al. 1974), probably because of cell swelling of the astrocyte. Degenerative changes also occur in neurons of the brain and fibers in peripheral nerves and their ganglion cells. Biochemically, neurons show an inhibition of protein synthesis that precedes and probably causes other biochemical defects such as inhibition of glycolysis. The earliest ultrastructural change in mercury-poisoned neurons is degranulation (ribosomal detachment) of rough endoplasmic reticulum; this reflects altered ribosomal protein synthesis (Jacobs et al. 1975). Degranulation is followed by progressive disorganization of Golgi membranes and neurofilaments, manifested as peripheral neuronal chromatolysis (Herman et al. 1973).

The capacity of mercurials to alter intracellular ion concentrations led to their use as diuretics. When toxic doses of these organic mercurials are used, water and sodium enter the renal tubule cells and move to the cisternae of the endoplasmic reticulum, which become markedly dilated. Experimentally, selective necrosis of proximal convoluted tubules can be produced by organic mercurials.

COPPER. Acute copper (Cu) poisoning occurs as a therapeutic overdose of anthelmintics, causing gastroenteritis due to the irritating effects of copper salts. Most common in sheep, it is accompanied by

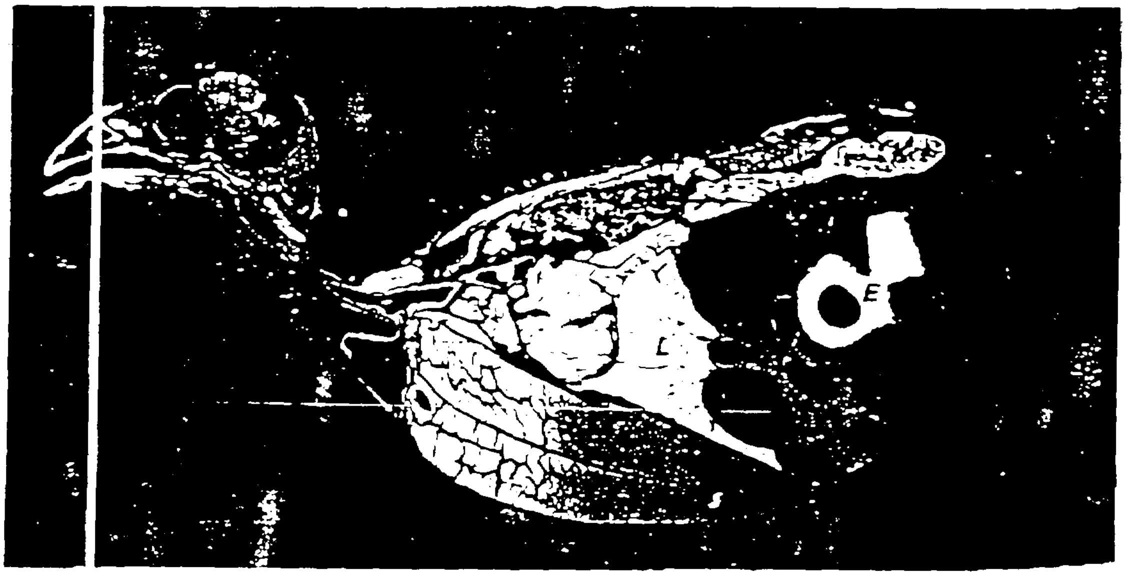

Fig. 9.14. Accumulation of radiolabeled mercury 4 days after experimental inoculation in whole section of quail (*white areas*). Heavy concentrations in beak, egg albumin (*E*), liver (*L*), kidney (*K*). (Micrograph: J. Backström)

Appendix L
Analytical Results for Samples Collected in April 1996 (Dioxin Samples)
LCP Site
Brunswick, GA
April 1997

ANALYTICAL REPORT

Prepared by
Roy F. Weston, Inc.

LCP Chemical Site
Brunswick, GA

June 1996

EPA Work Assignment No. 1-113
WESTON Work Order No. 03347-041-001-1113-01
EPA Contract No. 68-C4-0022

Submitted to
M. Sprenger
EPA-ERT

M. Huston Task Leader	Date 6/5/96	Analysis by: SWRI
V. Kansal Analytical Section Leader	Date 6/5/96	Prepared by: L. Sun
E. Gilardi Program Manager	Date 6/5/96	Reviewed by: Misty Barkley

\113\DEL\AR\9606\Report.rep

Table of Contents

Appendix will be furnished on request

INTRODUCTION

REAC, in response to ERT Work Assignment #1-113, provided analytical support for samples collected at the LCP Chemical Site located at Brunswick, GA. This support involved subcontracting and QA/QC data review for soil samples and a report summarizing the analytical procedures, the results, and QA/QC results.

The samples are summarized in the following table:

COC#	Number of Samples	Sampling Date	Date of Sample Receipt	Matrix	Analysis	Laboratory
04611	13	4/17/96	4/18/96	Soil	Furans and Dioxins	SWRI

CASE NARRATIVE

Because of this project spanned two option periods, several documents with the outdated Work Assignment number are present in this report.

The analytical data have been reviewed and were found to be acceptable.

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Summary of Abbreviations

B	The analyte was found in the blank
BFB	Bromofluorobenzene
BPQL	Below the Practical Quantitation Limit
C	Centigrade
D	(Surrogate Table) this value is from a diluted sample and was not calculated (Result Table) this result was obtained from a diluted sample
COC	Chain of Custody
CONC	Concentration
CRDL	Contract required detection limit
DFTPP	Decafluorotriphenylphosphine
DL	Detection limit
E	The value is greater than the highest linear standard and is estimated
EMPC	Estimated Maximum Possible Concentration
J	The value is below the method detection limit and is estimated
IDL	Instrument Detection Limit
ISTD	Internal Standard
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MI	Matrix Interference
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular weight
NA	either Not Applicable or Not Available
NC	Not Calculated
NR	Not Requested
NS	Not Spiked
% D	Percent difference
% REC	Percent Recovery
PQL	Practical Quantitation Limit
PPBV	Parts per billion by volume
QL	Quantitation Limit
RPD	Relative Percent Difference
U	Not Detected
m^3	cubic meter
kg	kilogram

g	gram	l(L)	liter
cg	centigram	dl	deciliter
mg	milligram	ml	milliliter
µg	microgram	µl	microliter
ng	nanogram		
pg	picogram		

* denotes a value that exceeds the acceptable QC limit

Abbreviations that are specific to a particular table are explained in footnotes on that table

Revision 7/7/94

\113\DEL\AR\9506\Report.rep

Analytical Procedure for Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans in Soil

The subcontract laboratory determined the tetra to octa chlorinated dioxin and furans according to U.S. EPA Method 8290. The calibration and internal standard level were based on Method 1613A.

The results of the analysis for chlorinated dibenzodioxins and chlorinated dibenzofurans are listed in Table 1.1.

Table 1.1 Results of the Analysis for Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans in Soil

WA #1-113 LCP Chemical Site

Based on Dry Weight

Sample ID Location %Solid	Method Blank #1 --- 100		Method Blank #2 --- 100		A6422 F2-Subsurface 20		A6423 106 32		A6424 105 23	
Analyte	Result ng/kg	MDL ng/kg	Result ng/kg	MDL ng/kg	Result ng/kg	MDL ng/kg	Result ng/kg	MDL ng/kg	Result ng/kg	MDL ng/kg
2,3,7,8-TCDD	U	1.3	U	1.0	U	0.83	U	0.35	2.0	
1,2,3,7,8-PeCDD	U	1.3	U	1.5	U	18	U	0.86	U	1.2
1,2,3,4,7,8-HxCDD	U	1.2	U	1.3	U	50	2.7		U	1.2
1,2,3,6,7,8-HxCDD	U	0.73	U	0.78	93 EMPC		2.5		7.5	
1,2,3,7,8,9-HxCDD	U	0.84	U	0.94	52		6.8		8.2	
1,2,3,4,6,7,8-HpCDD	U	1.0	U	0.71	720 EMPC		76		170	
OCDD	U	0.95	U	0.6	4700		710		1700	
2,3,7,8-TCDF	U	1.2	U	0.74	600		U	0.27	3.9	
1,2,3,7,8-PeCDF	U	0.40	U	0.94	1800		U	0.49	U	1.0
2,3,4,7,8-PeCDF	U	0.40	U	0.96	740		U	0.50	U	1.1
1,2,3,4,7,8-HxCDF	U	0.72	U	0.52	6900		1.3		9.7	
1,2,3,6,7,8-HxCDF	U	0.46	U	0.31	1100		U	0.36	1.7	
1,2,3,7,8,9-HxCDF	U	0.70	U	0.55	84		U	0.63	U	1.2
2,3,4,6,7,8-HxCDF	U	0.69	U	0.49	670		U	0.56	U	1.0
1,2,3,4,6,7,8-HpCDF	U	0.72	U	0.58	6700		3.5 EMPC		34	
1,2,3,4,7,8,9-HpCDF	U	0.86	U	0.61	1100		U	1.1	U	0.61
OCDF	U	1.1	U	0.55	5800 EMPC		3.0		20	
Total Tetra-Dioxins	U		U		8.90		13		14	
Total Penta-Dioxins	U		U		U		17		9.3	
Total Hexa-Dioxins	U		U		250		49		58	
Total Hepta-Dioxins	U		U		U		76		200	
Total Tetra-Furans	U		U		4200		U		27	
Total Penta-Furans	U		U		6100		U		12	
Total Hexa-Furans	U		U		13000		6.8		47	
Total Hepta-Furans	U		U		7700		3.5		39	

\113\DEL\AR\9606\LCP\dioxin.wk3

Table 1.1(Cont) Results of the Analysis for Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans in Soil

WA #1-113 LCP Chemical Site

Based on Dry Weight

Sample ID Location %Solid	A6425 110 27		A6426 107 29		A6427 106 28		A6428 F2-Surface 17		A6429 100 25	
Analyte	Result ng/kg	MDL ng/kg	Result ng/kg	MDL ng/kg	Result ng/kg	MDL ng/kg	Result ng/kg	MDL ng/kg	Result ng/kg	MDL ng/kg
2,3,7,8-TCDD	U	0.33	U	1.5	U	0.26	U	1.2	U	0.75
1,2,3,7,8-PeCDD	U	0.88	U	3.8	U	0.88	U	13	U	1.1
1,2,3,4,7,8-HxCDD	U	0.91	U	3.0	U	0.98	U	48	U	2.4
1,2,3,6,7,8-HxCDD	U	0.54	U	1.8	4.0 EMPC		410 EMPC		U	1.5
1,2,3,7,8,9-HxCDD	U	0.66	U	2.2	8.7		140 EMPC		U	1.8
1,2,3,4,6,7,8-HpCDD	66		44		150		1700 EMPC		170	
OCDD	690		450		1700		16000		1700	
2,3,7,8-TCDF	U	0.74	U	1.1	1.9 EMPC	1.1	700		6.5	
1,2,3,7,8-PeCDF	U	0.70	U	2.5	U		3600		24	
2,3,4,7,8-PeCDF	U	0.71	U	2.5	U		1100		6.8	
1,2,3,4,7,8-HxCDF	8.0		U	1.3	5.7 EMPC		15000		110	
1,2,3,6,7,8-HxCDF	U	0.40	U	0.8	U	0.65	1800		17	
1,2,3,7,8,9-HxCDF	U	0.71	U	1.4	U	1.1	120 EMPC		U	7.3
2,3,4,6,7,8-HxCDF	U	0.62	U	1.2	U	1.0	1400		9.3	
1,2,3,4,6,7,8-HpCDF	21		U	1.1	21		19000		140	
1,2,3,4,7,8,9-HpCDF	U	0.57	U	1.6	U	0.69	1900		24	
OCDF	11		U	1.8	18		16000		200	
Total Tetra-Dioxins	3.2		9.8		8.9		7.7		5.6	
Total Penta-Dioxins	U		9.9		8.9		U		U	
Total Hexa-Dioxins	17		150		60		380		43	
Total Hepta-Dioxins	75		170		150		U		670	
Total Tetra-Furans	5.0		U		8.5		5700		24	
Total Penta-Furans	6.5		U		6.7		11000		66	
Total Hexa-Furans	24		U		18		28000		180	
Total Hepta-Furans	24		U		25		17000		160	

QA/QC for Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans in Soil

The percent recoveries for the internal standards, listed in Table 2.1, ranged from 41 to 130. All 190 recovery values were within the acceptable QC limits.

Sample A6434 was chosen for the matrix spike/matrix spike duplicate (MS/MSD) analysis. The percent recoveries, listed in Table 2.2, ranged from 70 to 150. All 34 recoveries were within the QC limits. The relative percent differences (RPDs), also listed in Table 2.2, ranged from 0 (zero) to 35. All 17 RPD values were within QC limits. The QC limits were provided by the subcontract laboratory.

Table 2.1 Results of the Internal Standard Recoveries for Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans in Soil

WA #1-113 LCP Chemical Site

Sample ID Location	Unit	Method Blank#1 ---	Method Blank#2 ---	A6422 F2-Subsurface	A6423 108	QC Limits
^{13}C-2,3,7,8-TCDD	Percent	70	54	84	92	40-135
^{13}C-1,2,3,7,8-PeCDD	Percent	130	70	85	98	40-135
^{13}C-1,2,3,6,7,8-HxCDD	Percent	73	56	73	75	40-135
^{13}C-1,2,3,4,6,7,8-HpCDD	Percent	76	75	92	104	40-135
^{13}C-OCDD	Percent	90	78	88	111	40-135
^{13}C-2,3,7,8-TCDF	Percent	86	57	84	94	40-135
^{13}C-1,2,3,7,8-PeCDF	Percent	124	59	84	90	40-135
^{13}C-1,2,3,4,7,8-HxCDF	Percent	69	49	87	61	40-135
^{13}C-1,2,3,4,6,7,8-HpCDF	Percent	73	49	80	49	40-135
^{37}Cl-2,3,7,8-TCDD	Percent	77	71	108	107	40-135

Sample ID Location	Unit	A6424 105	A6425 110	A6426 107	A6427 106	QC Limits
^{13}C-2,3,7,8-TCDD	Percent	85	86	69	82	40-135
^{13}C-1,2,3,7,8-PeCDD	Percent	86	95	83	92	40-135
^{13}C-1,2,3,6,7,8-HxCDD	Percent	83	77	62	73	40-135
^{13}C-1,2,3,4,6,7,8-HpCDD	Percent	88	96	85	88	40-135
^{13}C-OCDD	Percent	88	106	91	86	40-135
^{13}C-2,3,7,8-TCDF	Percent	68	79	80	72	40-135
^{13}C-1,2,3,7,8-PeCDF	Percent	69	78	78	72	40-135
^{13}C-1,2,3,4,7,8-HxCDF	Percent	56	60	59	63	40-135
^{13}C-1,2,3,4,6,7,8-HpCDF	Percent	41	50	64	48	40-135
^{37}Cl-2,3,7,8-TCDD	Percent	92	98	78	92	40-135

Sample ID Location	Unit	A6428 F2-Surface	A6429 100	A6430 102	A6431 117	QC Limits
^{13}C-2,3,7,8-TCDD	Percent	79	80	74	79	40-135
^{13}C-1,2,3,7,8-PeCDD	Percent	94	91	80	120	40-135
^{13}C-1,2,3,6,7,8-HxCDD	Percent	70	67	65	70	40-135
^{13}C-1,2,3,4,6,7,8-HpCDD	Percent	88	77	89	77	40-135
^{13}C-OCDD	Percent	96	78	92	103	40-135
^{13}C-2,3,7,8-TCDF	Percent	71	86	75	104	40-135
^{13}C-1,2,3,7,8-PeCDF	Percent	76	90	74	112	40-135
^{13}C-1,2,3,4,7,8-HxCDF	Percent	61	71	63	64	40-135
^{13}C-1,2,3,4,6,7,8-HpCDF	Percent	45	59	47	70	40-135
^{37}Cl-2,3,7,8-TCDD	Percent	111	100	89	89	40-135

Table 2.1(Cont) Results of the Internal Standard Recoveries for Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans in Soil

WA #1-113 LCP Chemical Site

Sample ID Location	Unit	A6432 101	A6433 111	A6434 118	A6434MS 118	QC Limits
^{13}C-2,3,7,8-TCDD	Percent	78	74	76	87	40-135
^{13}C-1,2,3,7,8-PeCDD	Percent	111	88	84	91	40-135
^{13}C-1,2,3,6,7,8-HxCDD	Percent	69	78	77	73	40-135
^{13}C-1,2,3,4,6,7,8-HpCDD	Percent	76	73	69	78	40-135
^{13}C-OCDD	Percent	100	87	92	98	40-135
^{13}C-2,3,7,8-TCDF	Percent	104	66	71	75	40-135
^{13}C-1,2,3,7,8-PeCDF	Percent	109	83	117	121	40-135
^{13}C-1,2,3,4,7,8-HxCDF	Percent	61	82	80	52	40-135
^{13}C-1,2,3,4,6,7,8-HpCDF	Percent	70	71	75	75	40-135
^{37}Cl-2,3,7,8-TCDD	Percent	92	85	86	90	40-135

Sample ID Location	Unit	A6434MSD 118	A6428DL F2-Surface	A6422DL F2-Subsurface	QC Limits
^{13}C-2,3,7,8-TCDD	Percent	74	88	82	40-135
^{13}C-1,2,3,7,8-PeCDD	Percent	78	83	89	40-135
^{13}C-1,2,3,6,7,8-HxCDD	Percent	66	68	64	40-135
^{13}C-1,2,3,4,6,7,8-HpCDD	Percent	69	103	91	40-135
^{13}C-OCDD	Percent	83	112	108	40-135
^{13}C-2,3,7,8-TCDF	Percent	63	88	88	40-135
^{13}C-1,2,3,7,8-PeCDF	Percent	102	83	83	40-135
^{13}C-1,2,3,4,7,8-HxCDF	Percent	68	90	75	40-135
^{13}C-1,2,3,4,6,7,8-HpCDF	Percent	62	75	68	40-135
^{37}Cl-2,3,7,8-TCDD	Percent	72	109	93	40-135

Table 2.2 Results of the MS/MSD Analysis for Chlorinated Dibenzodioxins and Chlorinated Dibenzofurans in Soil

WA #1-113 LCP Chemical Site

Based on Dry Weight

Sample ID: A6434

Compounds	Sample Conc. ng/kg	MS Spike added ng/kg	MS Recovered ng/kg	MS %Rec.	MSD Spike added ng/kg	MSD Recovery ng/kg	MSD %Rec.	RPD	QC Limits RPD	QC Limits %Recovery
2,3,7,8-TCDD	U	95.2	92.46	97	95.2	91.46	96	1	50	50 - 150
1,2,3,7,8-PeCDD	U	476	524.54	110	476	539.70	113	3	50	50 - 150
1,2,3,4,7,8-HxCDD	U	476	420.32	88	476	557.80	117	28	50	50 - 150
1,2,3,6,7,8-HxCDD	U	476	357.82	75	476	509.89	107	35	50	50 - 150
1,2,3,7,8,9-HxCDD	U	476	358.41	75	476	487.50	102	31	50	50 - 150
1,2,3,4,6,7,8-HpCDD	184.22	476	725.62	114	476	727.34	114	0	50	50 - 150
OCDD	1803.19	952	2906.91	116	952	3229.18	150	25	50	50 - 150
2,3,7,8-TCDF	U	95.2	67.01	70	95.2	67.86	71	1	50	50 - 150
1,2,3,7,8-PeCDF	U	476	436.09	92	476	444.55	93	2	50	50 - 150
2,3,4,7,8-PeCDF	U	476	428.19	90	476	449.46	94	5	50	50 - 150
1,2,3,4,7,8-HxCDF	8.73	476	422.55	87	476	385.81	79	9	50	50 - 150
1,2,3,6,7,8-HxCDF	U	476	372.90	78	476	337.36	71	10	50	50 - 150
1,2,3,7,8,9-HxCDF	U	476	379.14	80	476	427.49	90	12	50	50 - 150
2,3,4,6,7,8-HxCDF	U	476	429.42	90	476	396.53	83	8	50	50 - 150
1,2,3,4,6,7,8-HpCDF	38.74	476	540.98	106	476	591.26	116	10	50	50 - 150
1,2,3,4,7,8,9-HpCDF	U	476	486.19	102	476	519.01	109	7	50	50 - 150
OCDF	46.45	952	797.48	79	952	848.47	84	7	50	50 - 150

Roy F. Weston, Inc.
GSA Raritan Depot
Building 209 Annex (Bay F)
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
908-321-4200 • Fax 908-494-4021

Southwest Labs of Oklahoma
1700 W. Albany Suite A
Broken Arrow, OK 74012

Attn: Dave LeMaster

April 3, 1996

Project # 3347-040-001-0113, LCP Chemical

As per Weston REAC Purchase Order number 60952, please analyze samples according to the following parameters:

Analysis/Method	Matrix	# of samples
Dioxin/SW-846-8290	Soil	9
Data package as per attached Deliverables Requirements		

Samples are expected to arrive at your laboratory on April 18, 1996. **All applicable QA/QC (MS/MSD) analysis as per method, will be performed on our sample matrix.** Preliminary sample and MS/MSD result tables plus a signed copy of our Chain of Custody must be faxed to REAC 10 business days after receipt of sample, with the complete data package due 21 business days after receipt of the last sample. The complete data package must include all items on the deliverables checklist.

Samples may be contaminated with Dioxin.

ALL ORGANIC EXTRACTIONSON SOLIDS MUST BE BY SOXHLET EXTRACTION.

Please submit all reports and technical questions concerning this project to **John Johnson at (908) 321-4248** or fax to (908) 494-4020. Any contractual question, please call Cynthia Davison at (908) 321-4296.
Thank you

Sincerely,

Misty Barkley

Misty Barkley
Data Validation and Report Writing Group Leader
Roy F. Weston, Inc. / REAC Project

MB:jj Attachments

cc: R. Singhvi
M. Sprenger
0113\non\mem\9604\sub\0113Con9
V. Kansal
Subcontracting File
B. Lewan
C. Davison
M. Huston
M. Barkley

REAC, Edison, NJ
(908) 321-4200
EPA Contract 68-C4-0022

CHAIN OF CUSTODY RECORD

Project Name: [illegible] EMILE, CA
Project Number: 03347-040-001-0113-01
RFW Contact: MARK HUSTON Phone: 908-321-4200
JOHN JOHNSON

No: 0611

SHEET NO. 1 OF 1

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	DIOXIN			
A6434	118 [illegible]	118	SD	4/17/96	1	8oz GLASS / 4°C	X			
A6433		111								
A6432		101								
A6431		117								
A6430		102								
A6429		100								
A6428		F2-SURFACE								
A6427		106								
A6426		107								
A6425		110								
A6424		105								
A6423		108								
A6422		F2-SUBSURFACE								

0001T

Matrix:

SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other
PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge
S - Soil
W - Water
O - Oil
A - Air

Special Instructions:

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

NO COOLER NUMBER - BLUE 48 qt COLEMAN

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/analyses	Mark Huston	4/17/96	[illegible signature]	4/18/96	0915						

FORM #4 8/94

* U.S. GPO 1994 383-015

Form 1

PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

CLIENT ID.
A6430

10R

Lab Name: Southwest Lab. of Oklahoma Episode No.: 25304

Lab Code: SWL Case No.: SDG No.: 25304 Analysis Method: 8290

Client Name: Weston Lab Sample ID: 25304.09

Matrix (aqueous/solid/leachate): solid Sample Wt/Vol: 10.0 g or mL: g

Sample Date:04/17/96 Initial Calibration Date: 04/12/96

Sample Receipt Date: 04/18/96 Instrument ID: 70S

Ext. Date: 04/19/96 Sample Data Filename: S102183#2

Analysis Date: 23-APR-96 Time: 18:14:30 Blank Data Filename: S102181#1

Dilution Factor: 1 Cal. Ver. Data Filename: S102180#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids: 23.99

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	QUAL. (1)	ION ABUND. RATIO (2)	RRT (2)
2,3,7,8-TCDD	U	0.428	U	*	*
1,2,3,7,8-PeCDD		0.994	U	*	*
1,2,3,4,7,8-HxCDD		1.654	U	*	*
1,2,3,6,7,8-HxCDD	5.668	0.986		1.13	1.001
1,2,3,7,8,9-HxCDD	9.924	1.200		1.09	1.011
1,2,3,4,6,7,8-HpCDD	175.898	0.812		0.99	1.000
OCDD	1795.379	0.846		0.83	1.000
2,3,7,8-TCDF	2.816 (EMPC)	0.431	X	0.63	1.001
1,2,3,7,8-PeCDF	U	0.829	U	*	*
2,3,4,7,8-PeCDF		0.845	U	*	*
1,2,3,4,7,8-HxCDF	12.058	~~3.750~~		1.19	1.001
1,2,3,6,7,8-HxCDF	U	2.257	U	*	*
1,2,3,7,8,9-HxCDF		3.956	U	*	*
2,3,4,6,7,8-HxCDF	3.890	3.497		1.11	1.025
1,2,3,4,6,7,8-HpCDF	36.542	0.522		1.13	1.000
1,2,3,4,7,8,9-HpCDF	6.907	0.727		1.05	1.037
OCDF	28.627	0.480		0.87	1.002
Total Tetra-Dioxins	7.453	0.428			
Total Penta-Dioxins	8.782	0.994			
Total Hexa-Dioxins	70.204	0.986			
Total Hepta-Dioxins	648.847	0.812			
Total Tetra-Furans	6.182	0.431			
Total Penta-Furans	24.344	0.845			
Total Hexa-Furans	44.750	2.257			
Total Hepta-Furans	43.449	0.522			

(1) Qualifier U indicates not detected; The X indicates EMPC.
The B indicates possible blank contamination.
(2) RRTs and ion ratios are specified in Tables 11 and 8, Method 8290 8290F1

Form 1

CLIENT ID.

PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

A6431

117

Lab Name: Southwest Lab. of Oklahoma   Episode No.: 25304

Lab Code: SWL   Case No.:   SDG No.: 25304   Analysis Method: 8290

Client Name: Weston   Lab Sample ID: 25304.10

Matrix (aqueous/solid/leachate): solid   Sample Wt/Vol: 10.0 g or mL: g

Sample Date:04/17/96   Initial Calibration Date: 01/12/96

Sample Receipt Date: 04/18/96   Instrument ID: AutoSpec

Ext. Date: 04/19/96   Sample Data Filename: A101966#3

Analysis Date: 24-APR-96 Time: 15:01:56   Blank Data Filename: A101959#1

Dilution Factor: 1   Cal. Ver. Data Filename: A101964#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg   % Solids: 22.17

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	Qual. (1)	ION ABUND. RATIO (2)	RRT (2)
2,3,7,8-TCDD	u -	1.561	U	*	*
1,2,3,7,8-PeCDD	-	2.943	U	*	*
1,2,3,4,7,8-HxCDD	-	5.264	U	*	*
1,2,3,6,7,8-HxCDD	-	3.298	U	*	*
1,2,3,7,8,9-HxCDD	-	3.826	U	*	*
1,2,3,4,6,7,8-HpCDD	137.753	~~15.357~~		1.05	1.001
OCDD	1481.322	~~2.567~~		0.97	1.000
2,3,7,8-TCDF	u -	1.691	U	*	*
1,2,3,7,8-PeCDF	-	1.504	U	*	*
2,3,4,7,8-PeCDF	-	1.510	U	*	*
1,2,3,4,7,8-HxCDF	12.086	~~3.097~~		1.24	1.001
1,2,3,6,7,8-HxCDF	u -	1.980	U	*	*
1,2,3,7,8,9-HxCDF	-	3.051	U	*	*
2,3,4,6,7,8-HxCDF	-	2.976	U	*	*
1,2,3,4,6,7,8-HpCDF	26.130	~~4.514~~		1.07	1.000
1,2,3,4,7,8,9-HpCDF	u -	5.426	U	*	*
OCDF	34.864	~~1.008~~		1.00	1.004
Total Tetra-Dioxins	-	1.561	U		
Total Penta-Dioxins	7.246	2.943			
Total Hexa-Dioxins	-	3.298	U		
Total Hepta-Dioxins	494.808	15.357			
Total Tetra-Furans	14.273	1.691			
Total Penta-Furans	20.091	1.510			
Total Hexa-Furans	52.250	1.980			
Total Hepta-Furans	26.130	4.514			

(1) Qualifier U indicates not detected; The X indicates EMPC.
The B indicates possible blank contamination.
(2) RRTs and ion ratios are specified in Tables 11 and 8, Method 8290   8290F1

Form 1

PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

CLIENT ID.
A6432
101

Lab Name: Southwest Lab. of Oklahoma Episode No.: 25304

Lab Code: SWL Case No.: SDG No.: 25304 Analysis Method: 8290

Client Name: Weston Lab Sample ID: 25304.11

Matrix (aqueous/solid/leachate): solid Sample Wt/Vol: 10.0 g or mL: g

Sample Date:04/17/96 Initial Calibration Date: 01/12/96

Sample Receipt Date: 04/18/96 Instrument ID: AutoSpec

Ext. Date: 04/19/95 Sample Data Filename: A101966#2

Analysis Date: 24-APR-96 Time: 14:12:32 Blank Data Filename: A101959#1

Dilution Factor: 1 Cal. Ver. Data Filename: A101964#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids: 23.21

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	Qual. (1)	ION ABUND. RATIO (2)	RRT (2)
2,3,7,8-TCDD	u -	1.548	U	*	*
1,2,3,7,8-PeCDD	-	1.947	U	*	*
1,2,3,4,7,8-HxCDD	-	4.565	U	*	*
1,2,3,6,7,8-HxCDD	-	2.860	U	*	*
1,2,3,7,8,9-HxCDD	-	3.319	U	*	*
1,2,3,4,6,7,8-HpCDD	125.164	~~20.640~~		1.17	1.000
OCDD	1386.664	~~2.319~~		0.88	1.000
2,3,7,8-TCDF	u -	~~1.719~~ ok	U	*	*
1,2,3,7,8-PeCDF	-	1.382	U	*	*
2,3,4,7,8-PeCDF	-	1.388	U	*	*
1,2,3,4,7,8-HxCDF	11.803	~~6.157~~		1.21	1.000
1,2,3,6,7,8-HxCDF	u -	3.936	U	*	*
1,2,3,7,8,9-HxCDF	-	6.064	U	*	*
2,3,4,6,7,8-HxCDF	-	5.915	U	*	*
1,2,3,4,6,7,8-HpCDF	29.673	~~2.457~~		0.92	1.000
1,2,3,4,7,8,9-HpCDF	u -	2.954	U	*	*
OCDF	38.506	~~1.039~~		0.81	1.004
Total Tetra-Dioxins	u -	~~1.548~~	U		
Total Penta-Dioxins	9.337	~~1.947~~			
Total Hexa-Dioxins	u -	~~2.860~~	U		
Total Hepta-Dioxins	498.291	~~20.640~~			
Total Tetra-Furans	18.961	~~1.719~~			
Total Penta-Furans	26.325	~~1.388~~			
Total Hexa-Furans	47.634	~~3.936~~			
Total Hepta-Furans	29.673	~~2.457~~			

(1) Qualifier U indicates not detected; The X indicates EMPC.
The B indicates possible blank contamination.
(2) RRTs and ion ratios are specified in Tables 11 and 8, Method 8290 8290F1

Form 1

CLIENT ID.

A6433

PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

Lab Name: Southwest Lab. of Oklahoma Episode No.: 25304

Lab Code: SWL Case No.: SDG No.: 25304 Analysis Method: 8290

Client Name: Weston Lab Sample ID: 25304.12

Matrix (aqueous/solid/leachate): solid Sample Wt/Vol: 10.0 g or mL: g

Sample Date:04/17/96 Initial Calibration Date: 01/12/96

Sample Receipt Date: 04/18/96 Instrument ID: AutoSpec

Ext. Date: 04/19/96 Sample Data Filename: A101960#1

Analysis Date: 23-APR-96 Time: 17:10:10 Blank Data Filename: A101959#1

Dilution Factor: 1 Cal. Ver. Data Filename: A101958#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids: 27.50

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	Qual. (1)	ION ABUND. RATIO (2)	RRT (2)
2,3,7,8-TCDD	u -	2.897	U	*	*
1,2,3,7,8-PeCDD	-	7.137	U	*	*
1,2,3,4,7,8-HxCDD	-	23.488	U	*	*
1,2,3,6,7,8-HxCDD	-	14.716	U	*	*
1,2,3,7,8,9-HxCDD	-	17.074	U	*	*
1,2,3,4,6,7,8-HpCDD	356.583	52.887		1.14	1.000
OCDD	3285.556	22.655		0.92	1.000
2,3,7,8-TCDF	153.512	5.430		0.78	1.001
1,2,3,7,8-PeCDF	170.109	8.234		1.59	1.001
2,3,4,7,8-PeCDF	53.220	8.271		1.50	1.028
1,2,3,4,7,8-HxCDF	479.172 (EMPC)	11.238	X	1.69	1.001
1,2,3,6,7,8-HxCDF	139.025	7.186		1.42	1.003
1,2,3,7,8,9-HxCDF	u -	11.070	U	*	*
2,3,4,6,7,8-HxCDF	141.403	10.796		1.17	1.019
1,2,3,4,6,7,8-HpCDF	1101.075	15.356		1.04	1.000
1,2,3,4,7,8,9-HpCDF	96.820	18.462		1.08	1.036
OCDF	1062.260	6.131		0.92	1.004
Total Tetra-Dioxins	u -	2.897	U		
Total Penta-Dioxins	-	7.137	U		
Total Hexa-Dioxins	-	14.716	U		
Total Hepta-Dioxins	1062.355	52.887			
Total Tetra-Furans	946.501	5.430			
Total Penta-Furans	882.732	8.271			
Total Hexa-Furans	946.694	7.186			
Total Hepta-Furans	1197.894	15.356			

(1) Qualifier U indicates not detected; The X indicates EMPC.
The B indicates possible blank contamination.
(2) RRTs and ion ratios are specified in Tables 11 and 8, Method 8290 8290F1

Form 1

PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

~~CLIENT~~ ID.
A6434

118

Lab Name: Southwest Lab. of Oklahoma Episode No.: 25304

Lab Code: SWL Case No.: SDG No.: 25304 Analysis Method: 8290

Client Name: Weston Lab Sample ID: 25304.13

Matrix (aqueous/solid/leachate): solid Sample Wt/Vol: 10.0 g or mL: g

Sample Date:04/17/96 Initial Calibration Date: 01/12/96

Sample Receipt Date: 04/18/96 Instrument ID: AutoSpec

Ext. Date: 04/19/96 Sample Data Filename: A101960#2

Analysis Date: 23-APR-96 Time: 17:59:31 Blank Data Filename: A101959#1

Dilution Factor: 1 Cal. Ver. Data Filename: A101958#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids: 20.97

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	Qual (1)	ION ABUND. RATIO (2)	RRT (2)
2,3,7,8-TCDD	u -	2.934	U	*	*
1,2,3,7,8-PeCDD	-	4.524	U	*	*
1,2,3,4,7,8-HxCDD	-	5.670	U	*	*
1,2,3,6,7,8-HxCDD	-	3.552	U	*	*
1,2,3,7,8,9-HxCDD	-	4.121	U	*	*
1,2,3,4,6,7,8-HpCDD	184.220	~~6.640~~		1.07	1.000
OCDD	1803.190	~~4.047~~		0.88	1.000
2,3,7,8-TCDF	u -	3.683	U	*	*
1,2,3,7,8-PeCDF	-	1.680	U	*	*
2,3,4,7,8-PeCDF	-	1.687	U	*	*
1,2,3,4,7,8-HxCDF	8.734 (EMPC)	~~6.735~~	X	1.79	1.000
1,2,3,6,7,8-HxCDF	u -	4.306	U	*	*
1,2,3,7,8,9-HxCDF	-	6.634	U	*	*
2,3,4,6,7,8-HxCDF	-	6.470	U	*	*
1,2,3,4,6,7,8-HpCDF	38.739	~~4.244~~		0.90	1.000
1,2,3,4,7,8,9-HpCDF	u -	5.102	U	*	*
OCDF	46.445	~~3.765~~		0.89	1.004
Total Tetra-Dioxins	u -	2.934	U		
Total Penta-Dioxins	-	4.524	U		
Total Hexa-Dioxins	40.580	3.552			
Total Hepta-Dioxins	729.531	6.640			
Total Tetra-Furans	u -	3.683	U		
Total Penta-Furans	36.118	1.687			
Total Hexa-Furans	37.532	4.306			
Total Hepta-Furans	38.739	4.244			

(1) Qualifier U indicates not detected; The X indicates EMPC.
The B indicates possible blank contamination.
(2) RRTs and ion ratios are specified in Tables 11 and 8, Method 8290 8290F1

Appendix M
Hazard Quotient Calculations
LCP Site
Brunswick, GA
April 1997

Marsh wren - Mercury

Location	Conc in Sediment (mg/kg)	Sed Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Grasshopper (mg/kg)	Percent Greasshopper in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0.13	0.00006	0.000	0.000	0.0027	0.000	0.02	1.00	0.01	0.000	1.00	0.01	0.02	0.12	0.16
M-1	720.00	0.00006	0.043	NA	0.0027	0.000	0.34	1.00	0.01	0.003	1.00	0.01	4.39	0.12	36.57
M-2	215.00	0.00006	0.013	NA	0.0027	0.000	0.14	1.00	0.01	0.001	1.00	0.01	1.35	0.12	11.21

Sediment concentration in mg/kg, dry weight (M-1 is a mean of H-1 and H-2 [Table 6], M-2 is a mean of H2 - L2 [Tables 6 and 10])
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in grasshoppers in mg/kg, wet weight (Table 65)
Concentration in grasshopper reference sample reported as 1/2 the detection limit (0 130 mg/kg, dry weight)

Marsh wren - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc. in Grasshopper (mg/kg)	Percent Grasshopper in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0.08	0.00006	0.000	0.000	0.0027	0.000	NA	1.00	0.01	0.000	1.00	0.01	0.00	0.28	0.00
M-1	2420.00	0.00006	0.145	NA	0.0027	0.000	0.24	1.00	0.01	0.002	1.00	0.01	15.70	0.28	56.06
M-2	309.00	0.00006	0.019	NA	0.0027	0.000	0.17	1.00	0.01	0.002	1.00	0.01	2.15	0.28	7.67

Concentration of PCBs in grasshoppers from the reference area were unavailable
Sediment concentration in mg/kg, dry weight (M-1 is a mean of H-1 and H-2 [Table 4], M-2 is a mean of H2 - L2 [Table 4])
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in grasshoppers in mg/kg, wet weight (Table 65)
Concentration in grasshopper reference sample reported as 1/2 the detection limit (0 130 mg/kg, dry weight)

Marsh wren - Mercury

Location	Conc in Sed (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Grasshopper (mg/kg)	Percent Greasshopper in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0 13	0 00006	0 000	0 00	0 0027	0.000	0 02	1.00	0.01	0.000	1.00	0.01	0.02	1.20	0.02
M-1	720 00	0 00006	0 043	NA	0.0027	0.000	0 34	1 00	0 01	0.003	1.00	0 01	4.65	1.20	3.88
M-2	215 00	0 00006	0.013	NA	0 0027	0.000	0.14	1.00	0.01	0.001	1.00	0.01	1.43	1.20	1.19

Sediment concentration in mg/kg, dry weight (M-1 is a mean of H-1 and H-2 [Table 6], M-2 is a mean of H2 - L2 [Tables 6 and 10])
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in grasshoppers in mg/kg, wet weight (Table 65)
Concentration in grasshopper reference sample reported as 1/2 the detection limit (0 130 mg/kg, dry weight)

Marsh wren - PCBs

Location	Conc in Sed (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Grasshopper (mg/kg)	Percent Grasshopper in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0 08	0 00006	0 000	0 000	0 0027	0.000	NA	1.00	0 01	0.000	1.00	0.01	0.00	2 80	0.00
M-1	2420 00	0 00006	0 145	NA	0 0027	0 000	0 24	1 00	0 01	0 002	1.00	0.01	14.75	2.80	5.27
M-2	309 00	0 00006	0 019	NA	0.0027	0 000	0 17	1.00	0.01	0.002	1.00	0.01	2.02	2.80	0.72

Concentration of PCBs in grasshoppers from the reference area were unavailable
Sediment concentration in mg/kg, dry weight (M-1 is a mean of H-1 and H-2 [Table 4], M-2 is a mean of H2 - L2 [Table 4])
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in grasshoppers in mg/kg, wet weight (Table 65)
Concentration in grasshopper reference sample reported as 1/2 the detection limit (0 130 mg/kg, dry weight)

Terrapin - Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0.13	0.00005	0.000	0.000	NA	0.00	0.02	0.50	0.19	0.50	0.004	0.00	1.00	0.14	0.00	5.00	0.00
LCP 10-11	34.00	0.00005	0.002	0.000	NA	0.00	0.22	0.50	21.80	0.50	0.004	0.04	1.00	0.14	0.30	5.00	0.06
LCP 17-18	15.00	0.00005	0.001	0.003	NA	0.00	0.68	0.50	8.80	0.50	0.004	0.02	1.00	0.14	0.13	5.00	0.03
LCP 19-20	170.00	0.00005	0.009	0.009	NA	0.00	0.76	0.50	108.90	0.50	0.004	0.20	1.00	0.14	1.48	5.00	0.30
LCP 35	90.00	0.00005	0.005	0.010	NA	0.00	0.80	0.50	57.70	0.50	0.004	0.11	1.00	0.14	0.79	5.00	0.16

Sediment concentrations in mg/kg, dry weight (Table 9)
Sediment ingestion in kg/day, dry weight (Table B-1)
Concentration in fiddler crabs in mg/kg, wet weight (Table 30)
Concentration in snails in mg/kg, wet weight (Table 42)

Terrapin - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc. in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0.08	0.00005	0.000	0.00	NA	0.00	0.03	0.50	0.02	0.50	0.004	0.00	1.00	0.14	0.00	3.23	0.00
LCP 10-11	2.29	0.00005	0.000	0.00	NA	0.00	1.60	0.50	0.05	0.50	0.004	0.00	1.00	0.14	0.02	3.23	0.01
LCP 17-18	56.00	0.00005	0.003	0.00	NA	0.00	13.80	0.50	1.10	0.50	0.004	0.03	1.00	0.14	0.21	3.23	0.07
LCP 19-20	150.00	0.00005	0.008	0.07	NA	0.00	18.40	0.50	3.20	0.50	0.004	0.04	1.00	0.14	0.33	3.23	0.10
LCP 35	70.00	0.00005	0.004	0.02	NA	0.00	13.10	0.50	1.50	0.50	0.004	0.03	1.00	0.14	0.21	3.23	0.07

Sediment concentrations in mg/kg, dry weight (Table 3)
Sediment ingestion in kg/day, dry weight (Table B-1)
Concentration in fiddler crabs in mg/kg, wet weight (Table 30)
Concentration in snails in mg/kg, wet weight (Table 42)

Terrapin - Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc. in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0 13	0 00005	0 000	0 000	NA	0 00	0 02	0 50	0.19	0 50	0.004	0.00	1.00	0.14	0.00	50.00	0.00
LCP 10-11	34 00	0 00005	0 002	0 000	NA	0 00	0 22	0 50	21.80	0 50	0 004	0.04	1.00	0.14	0.30	50.00	0.01
LCP 17-18	15 00	0 00005	0 001	0 003	NA	0 00	0 68	0 50	8.80	0.50	0.004	0.02	1.00	0.14	0.13	50.00	0.00
LCP 19-20	170 00	0 00005	0 009	0 009	NA	0 00	0.76	0 50	108 90	0.50	0.004	0 20	1.00	0 14	1.48	50.00	0.03
LCP 35	90 00	0 00005	0 005	0 010	NA	0 00	0 80	0.50	57.70	0.50	0.004	0.11	1.00	0.14	0.79	50.00	0.02

Sediment concentrations in mg/kg. dry weight (Table 9)
Sediment ingestion in kg/day. dry weight (Table B-1)
Concentration in fiddler crabs in mg/kg. wet weight (Table 30)
Concentration in snails in mg/kg. wet weight (Table 42)

Terrapin - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0 08	0 00005	0 000	0 00	NA	0 00	0 03	0 50	0 02	0 50	0 004	0.00	1.00	0.14	0.00	32.30	0.00
LCP 10-11	2 29	0 00005	0 000	0 00	NA	0 00	1.60	0 50	0.05	0 50	0.004	0.00	1.00	0.14	0.02	32.30	0.00
LCP 17-18	56 00	0 00005	0 003	0 00	NA	0 00	13 80	0 50	1 10	0 50	0.004	0.03	1.00	0.14	0.21	32.30	0.01
LCP 19-20	150 00	0 00005	0 008	0 07	NA	0 00	18 40	0 50	3 20	0 50	0.004	0.04	1.00	0.14	0.33	32.30	0.01
LCP 35	70 00	0 00005	0 004	0 02	NA	0.00	13 10	0.50	1.50	0.50	0.004	0.03	1.00	0.14	0.21	32.30	0.01

Sediment concentrations in mg/kg. dry weight (Table 3)
Sediment ingestion in kg/day. dry weight (Table B-1)
Concentration in fiddler crabs in mg/kg. wet weight (Table 30)
Concentration in snails in mg/kg. wet weight (Table 42)

Wood Stork Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Killifish (mg/kg)	Percent Killifish in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0 13	0 003	0.00	0 00	NA	0.00	0 02	1.00	0.52	0.01	1.00	2.05	0.01	0.10	0.05
LCP 43	2 00	0 003	0 01	NA	NA	0.00	0 23	1 00	0.52	0.12	1.00	2.05	0.06	0.10	0.61
LCP 71	30 00	0 003	0 09	NA	NA	0.00	0.61	1 00	0.52	0.32	1.00	2 05	0.20	0.10	1.99
LCP 35	90 00	0 003	0 27	0 01	NA	0.00	0.71	1.00	0 52	0.37	1.00	2 05	0.31	0.10	3.12

Sediment concentration in mg/kg, dry weight (Tables 9 and 10)
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in killifish in mg/kg, wet weight (Table 41)
Food ingestion rate in kg/day, wet weight (Table B-1)

Wood Stork - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Killifish (mg/kg)	Percent Killifish in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0 08	0 003	0 00	0 00	NA	0.00	0 02	1.00	0.52	0.01	1 00	2.05	0.01	2.00	0.00
LCP 43	5 20	0 003	0 02	NA	NA	0.00	0.88	1.00	0.52	0.46	1.00	2.05	0.23	2.00	0.12
LCP 71	66.00	0 003	0 20	NA	NA	0.00	15 40	1.00	0.52	8.01	1.00	2.05	4.00	2.00	2.00
LCP 35	70.00	0 003	0 21	0 02	NA	0.00	20 10	1.00	0.52	10.45	1.00	2.05	5.20	2.00	2.60

Sediment concentration in mg/kg, dry weight (Tables 3 and 4)
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in killifish in mg/kg, wet weight (Table 41)
Food ingestion rate in kg/day, wet weight (Table B-1)

Wood Stork - Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc. in Killifish (mg/kg)	Percent Killifish in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0 13	0 003	0 00	0 00	NA	0 00	0.02	1.00	0 52	0.01	1.00	2.05	0.01	1.12	0.00
LCP 43	2 00	0 003	0 01	NA	NA	0 00	0.23	1.00	0 52	0.12	1.00	2.05	0.06	1.12	0.05
LCP 71	30 00	0 003	0 09	NA	NA	0 00	0.61	1.00	0 52	0.32	1.00	2.05	0.20	1.12	0.18
LCP 35	90 00	0 003	0 27	0 01	NA	0 00	0.71	1.00	0 52	0.37	1.00	2.05	0.31	1.12	0.28

Sediment concentration in mg/kg, dry weight (Tables 9 and 10)
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in killifish in mg/kg, wet weight (Table 41)
Food ingestion rate in kg/day, wet weight (Table B-1)

Wood Stork - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc. in Killifish (mg/kg)	Percent Killifish in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0 08	0 003	0 00	0 00	NA	0.00	0.02	1 00	0.52	0.01	1.00	2.05	0.01	20.00	0.00
LCP 43	5 20	0 003	0 02	NA	NA	0 00	0 88	1 00	0.52	0.46	1.00	2 05	0.23	20.00	0.01
LCP 71	66 00	0 003	0 20	NA	NA	0 00	15 40	1 00	0.52	8.01	1.00	2.05	4 00	20.00	0.20
LCP 35	70 00	0 003	0 21	0 02	NA	0 00	20.10	1.00	0.52	10.45	1.00	2.05	5.20	20.00	0.26

Sediment concentration in mg/kg, dry weight (Tables 3 and 4)
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in killifish in mg/kg, wet weight (Table 41)
Food ingestion rate in kg/day, wet weight (Table B-1)

Clapper Rail - Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0.13	0.001	0.00	0.00	0.07	0.00	0.02	0.80	0.19	0.20	0.070	0.00	1.00	0.25	0.015	0.12	0.13
LCP 10-11	34.00	0.001	0.03	0.00	0.07	0.00	0.22	0.80	21.80	0.20	0.070	0.32	1.00	0.25	1.384	0.12	11.53
LCP 17-18	15.00	0.001	0.02	0.00	0.07	0.00	0.68	0.80	8.80	0.20	0.070	0.16	1.00	0.25	0.695	0.12	5.79
LCP 19-20	170.00	0.001	0.17	0.01	0.07	0.00	0.76	0.80	109.00	0.20	0.070	1.57	1.00	0.25	6.847	0.12	57.06
LCP 35	90.00	0.001	0.09	0.01	0.07	0.00	0.80	0.80	57.70	0.20	0.070	0.85	1.00	0.25	3.714	0.12	30.95

Sediment concentrations in mg/kg, dry weight (Table 9)
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in fiddler crab in mg/kg, wet weight (Table 30)
Concentration in snails in mg/kg, wet weight (Table 42)
Concentration in snails from locations 10-11, 19-20, and 35 based on accumulation factor from location 17-18
Food ingestion rate in kg/day, wet weight (Table B-1)

Clapper Rail - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0.08	0.001	0.00	0.00	0.07	0.00	0.02	0.80	0.02	0.20	0.070	0.00	1.00	0.25	0.006	0.28	0.02
LCP 10-11	2.29	0.001	0.00	0.00	0.07	0.00	1.60	0.80	0.05	0.20	0.070	0.09	1.00	0.25	0.370	0.28	1.32
LCP 17-18	56.00	0.001	0.06	0.00	0.07	0.00	13.70	0.80	1.10	0.20	0.070	0.78	1.00	0.25	3.355	0.28	11.98
LCP 19-20	150.00	0.001	0.15	0.01	0.07	0.00	18.40	0.80	3.20	0.20	0.070	1.08	1.00	0.25	4.903	0.28	17.51
LCP 35	70.00	0.001	0.07	0.01	0.07	0.00	13.00	0.80	1.50	0.20	0.070	0.75	1.00	0.25	3.279	0.28	11.71

Sediment concentrations in mg/kg, dry weight (Table 3)
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in fiddler crabs in mg/kg, wet weight (Table 30)
Concentration in snails in mg/kg, wet weight (Table 42)
Concentration in snails from locations 10-11, 19-20, and 35 based on accumulation factor from location 17-18
Food ingestion rate in kg/day, wet weight (Table B-1)

Clapper Rail Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0.13	0.001	0.00	0.00	0.07	0.00	0.02	0.80	0.19	0.20	0.070	0.00	1.00	0.25	0.016	1.20	0.01
LCP 10-11	34.00	0.001	0.03	0.00	0.07	0.00	0.22	0.80	21.80	0.20	0.070	0.32	1.00	0.25	1.406	1.20	1.17
LCP 17-18	15.00	0.001	0.02	0.00	0.07	0.00	0.68	0.80	8.80	0.20	0.070	0.16	1.00	0.25	0.706	1.20	0.59
LCP 19-20	170.00	0.001	0.17	0.01	0.07	0.00	0.76	0.80	109.00	0.20	0.070	1.57	1.00	0.25	6.957	1.20	5.80
LCP 35	90.00	0.001	0.09	0.01	0.07	0.00	0.80	0.80	57.70	0.20	0.070	0.85	1.00	0.25	3.773	1.20	3.14

Sediment concentrations in mg/kg dry weight (Table 9)
Sediment ingestion rate in kg/day dry weight (Table B-1)
Concentration in fiddler crab in mg/kg wet weight (Table 30)
Concentration in snails in mg/kg wet weight (Table 42)
Concentration in snails from locations 10-11, 19-20 and 35 based on accumulation factor from location 17-18
Food ingestion rate in kg/day wet weight (Table B-1)

Clapper Rail - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0.08	0.001	0.00	0.00	0.07	0.00	0.02	0.80	0.02	0.20	0.070	0.00	1.00	0.25	0.006	2.80	0.00
LCP 10-11	2.29	0.001	0.00	0.00	0.07	0.00	1.60	0.80	0.05	0.20	0.070	0.09	1.00	0.25	0.370	2.80	0.13
LCP 17-18	56.00	0.001	0.06	0.00	0.07	0.00	13.70	0.80	1.10	0.20	0.070	0.78	1.00	0.25	3.355	2.80	1.20
LCP 19-20	150.00	0.001	0.15	0.01	0.07	0.00	18.36	0.80	3.20	0.20	0.070	1.07	1.00	0.25	4.894	2.80	1.75
LCP 35	70.00	0.001	0.07	0.01	0.07	0.00	13.00	0.80	1.50	0.20	0.070	0.75	1.00	0.25	3.279	2.80	1.17

Sediment concentrations in mg/kg dry weight (Table 3)
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in fiddler crabs in mg/kg, wet weight (Table 30)
Concentration in snails in mg/kg, wet weight (Table 42)
Concentration in snails from locations 10-11, 19-20, and 35 based on accumulation factor from location 17-18
Food ingestion rate in kg/day wet weight (Table B-1)

Raccoon - Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0.13	0.015	0.00	0.00	0.18	0.00	0.02	0.90	0.19	0.10	0.50	0.02	1.00	2.00	0.01	0.25	0.04
LCP 10-11	34.00	0.015	0.51	0.00	0.18	0.00	0.22	0.90	21.80	0.10	0.50	0.10	1.00	2.00	0.30	0.25	1.22
LCP 17-18	15.00	0.015	0.23	0.00	0.18	0.00	0.68	0.90	8.80	0.10	0.50	0.74	1.00	2.00	0.48	0.25	1.94
LCP 19-20	170.00	0.015	2.55	0.01	0.18	0.00	0.76	0.90	108.90	0.10	0.50	0.34	1.00	2.00	1.45	0.25	5.78
LCP 35	90.00	0.015	1.35	0.01	0.18	0.00	0.80	0.90	57.70	0.10	0.50	0.36	1.00	2.00	0.86	0.25	3.42

Sediment concentrations in mg/kg, dry weight (Table 9)
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in fiddler crab in mg/kg, wet weight (Table 30)
Concentration in snails in mg/kg, wet weight (Table 42)
Concentration in snails from locations 10-11, 19-20, and 35 based on accumulation factor from location 17-18
Food ingestion rate in kg/day, wet weight (Table B-1)

Raccoon - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc. in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0.08	0.015	0.00	0.00	0.18	0.00	0.03	0.90	0.02	0.10	0.50	0.01	1.00	2.00	0.01	0.13	0.06
LCP 10-11	2.29	0.015	0.03	0.00	0.18	0.00	1.62	0.90	0.05	0.10	0.50	0.73	1.00	2.00	0.38	0.13	2.94
LCP 17-18	56.00	0.015	0.84	0.00	0.18	0.00	13.77	0.90	1.10	0.10	0.50	6.25	1.00	2.00	3.55	0.13	27.28
LCP 19-20	150.00	0.015	2.25	0.07	0.18	0.01	18.36	0.90	3.20	0.10	0.50	8.26	1.00	2.00	5.26	0.13	40.48
LCP 35	70.00	0.015	1.05	0.02	0.18	0.00	13.07	0.90	1.50	0.10	0.50	5.88	1.00	2.00	3.47	0.13	26.68

Sediment concentrations in mg/kg, dry weight (Table 3)
Sediment ingestion in kg/day, dry weight (Table B-1)
Concentrations in fiddler crab in mg/kg, wet weight (Table 30)
Concentration in snails in mg/kg, wet weight (Table 42)
Concentration in snails from locations 10-11, 19-20, and 35 based on accumulation factor from location 17-18
Food ingestion rate in kg/day, wet weight (Table B-1)

Raccoon - Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc. in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0.13	0.015	0.00	0.00	0.18	0.00	0.02	0.90	0.19	0.10	0.50	0.02	1.00	2.00	0.01	2.50	0.00
LCP 10-11	34.00	0.015	0.51	0.00	0.18	0.00	0.22	0.90	21.80	0.10	0.50	0.10	1.00	2.00	0.30	2.50	0.12
LCP 17-18	15.00	0.015	0.23	0.00	0.18	0.00	0.68	0.90	8.80	0.10	0.50	0.74	1.00	2.00	0.48	2.50	0.19
LCP 19-20	170.00	0.015	2.55	0.01	0.18	0.00	0.76	0.90	108.90	0.10	0.50	0.34	1.00	2.00	1.45	2.50	0.58
LCP 35	90.00	0.015	1.35	0.01	0.18	0.00	0.80	0.90	57.70	0.10	0.50	0.36	1.00	2.00	0.86	2.50	0.34

Sediment concentrations in mg/kg, dry weight (Table 9)
Sediment ingestion rate in kg/day, dry weight (Table B-1)
Concentration in fiddler crab in mg/kg, wet weight (Table 30)
Concentration in snails in mg/kg, wet weight (Table 42)
Concentration in snails from locations 10-11, 19-20, and 35 based on accumulation factor from location 17-18
Food ingestion rate in kg/day, wet weight (Table B-1)

Raccoon - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc. in Fiddler crab (mg/kg)	Percent Crabs in Diet	Conc in Snails (mg/kg)	Percent Snails in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0.08	0.015	0.00	0.00	0.18	0.00	0.03	0.90	0.02	0.10	0.50	0.01	1.00	2.00	0.01	3.30	0.00
LCP 10-11	2.29	0.015	0.03	0.00	0.18	0.00	1.62	0.90	0.05	0.10	0.50	0.73	1.00	2.00	0.38	3.30	0.12
LCP 17-18	56.00	0.015	0.84	0.00	0.18	0.00	13.77	0.90	1.10	0.10	0.50	6.25	1.00	2.00	3.55	3.30	1.07
LCP 19-20	150.00	0.015	2.25	0.07	0.18	0.01	18.36	0.90	3.20	0.10	0.50	8.26	1.00	2.00	5.26	3.30	1.59
LCP 35	70.00	0.015	1.05	0.02	0.18	0.00	13.07	0.90	1.50	0.10	0.50	5.88	1.00	2.00	3.47	3.30	1.05

Sediment concentrations in mg/kg, dry weight (Table 3)
Sediment ingestion in kg/day, dry weight (Table B-1)
Concentrations in fiddler crab in mg/kg, wet weight (Table 30)
Concentration in snails in mg/kg, wet weight (Table 42)
Concentration in snails from locations 10-11, 19-20, and 35 based on accumulation factor from location 17-18
Food ingestion rate in kg/day, wet weight (Table B-1)

Otter- Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc. in Killifish (mg/kg)	Percent Killifish in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0 13	0 007	0.00	0 00	0 42	0.00	0 02	1.00	1.50	0.03	1.00	5.84	0.01	0.25	0.02
LCP 71	30 00	0 007	0 21	NA	0 42	0 00	0 60	1.00	1.50	0 90	1.00	5.84	0.19	0.25	0.76
LCP 43	2 00	0 007	0 01	NA	0 42	0.00	0 24	1 00	1.50	0 36	1.00	5.84	0.06	0 25	0.26
LCP 35	90 00	0 007	0 63	0 01	0 42	0 00	0 71	1.00	1.50	1.07	1.00	5.84	0.29	0.25	1.16

Sediment concentrations are in mg/kg, dry weight (Tables 9 and 10)
Sediment ingestion rate in mg/kg, dry weight (Table B-1)
Concentration in killifish in mg/kg, wet weight (Table 41)
Food ingestion rate in mg/kg, wet weight (Table B-1)
LOAEL in mg/kg/day (Table D-1)

Otter - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc. in Killifish (mg/kg)	Percent Killifish in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0.08	0 007	0 00	0 00	0 42	0.00	0.02	1 00	1.50	0.03	1.00	5.84	0.01	0.13	0.04
LCP 71	66 00	0 007	0 46	NA	0 42	0.00	15.40	1.00	1.50	23.10	1.00	5.84	4 03	0.13	31.04
LCP 43	5.20	0 007	0 04	NA	0 42	0.00	0.88	1 00	1.50	1.32	1.00	5.84	0.23	0.13	1.79
LCP 35	70.00	0.007	0 49	0.02	0 42	0.01	20.07	1.00	1.50	30.11	1.00	5.84	5.24	0.13	40.31

Sediment concentration in mg/kg, dry weight (Tables 3 and 4)
Sediment ingestion rate in mg/kg, dry weight (Table B-1)
Concentration in killifish in mg/kg, wet weight (Table 41)
Food ingestion rate in mg/kg, wet weight (Table B-1)
LOAEL in mg/kg/day (Table C-1)

Otter- Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc. in Killifish (mg/kg)	Percent Killifish in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0 13	0 007	0 00	0 00	0 42	0 00	0.02	1 00	1 50	0.03	1.00	5.84	0.01	2.50	0.00
LCP 71	30 00	0 007	0 21	NA	0 42	0.00	0.61	1.00	1.50	0.92	1.00	5.84	0.19	2.50	0.08
LCP 43	2.00	0 007	0 01	NA	0 42	0.00	0.24	1.00	1.50	0 35	1.00	5.84	0.06	2.50	0.03
LCP 35	90 00	0 007	0 63	0 01	0 42	0 00	0.71	1.00	1.50	1.07	1.00	5.84	0.29	2.50	0.12

Sediment concentrations are in mg/kg. dry weight (Tables 9 and 10)
Sediment ingestion rate in mg/kg, dry weight (Table B-1)
Concentration in killifish in mg/kg, wet weight (Table 41)
Food ingestion rate in mg/kg, wet weight (Table B-1)
Acute value in mg/kg/day (Table D-1)

Otter - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc. in Killifish (mg/kg)	Percent Killifish in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0.08	0 007	0 00	0 00	0 42	0 00	0.02	1.00	1.50	0.03	1.00	5.84	0.01	3.30	0.00
LCP 71	66 00	0 007	0 46	NA	0 42	0 00	15 40	1 00	1 50	23.10	1.00	5.84	4.03	3.30	1.22
LCP 43	5.20	0 007	0 04	NA	0 42	0 00	0.88	1.00	1.50	1.32	1.00	5.84	0.23	3.30	0.07
LCP 35	70.00	0 007	0 49	0 02	0 42	0.01	20.07	1.00	1.50	30.11	1.00	5.84	5.24	3.30	1.59

Sediment concentration in mg/kg, dry weight (Tables 3 and 4)
Sediment ingestion rate in mg/kg, dry weight (Table B-1)
Concentration in killifish in mg/kg, wet weight (Table 41)
Food ingestion rate in mg/kg, wet weight (Table B-1)
Acute value in mg/kg/day (Table C-1)

Manatee - Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg day)	Total Sediment (mg/kg/day)	Conc in Water (mg L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Vegetation (mg/kg)	Percent Vegetation in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0 13	NA	0 00	0 00	NA	0 00	0 02	1 00	50.00	1.00	1 00	500.00	0.00	0.80	0.00
LCP 17-18	15 00	NA	0 00	0 00	NA	0 00	0 56	1 00	50.00	28.00	1.00	500.00	0.06	0.80	0.07
LCP 35	90 00	NA	0 00	0 01	NA	0 00	2 60	1 00	50.00	130.00	1.00	500.00	0.26	0.80	0.33

Sediment concentration in mg/kg, dry weight (Table 9)
Vegetation concentration in mg/kg, wet weight (Table 43)
Food Ingestion rate in mg/kg, wet weight (Table B-1)
Concentration of mercury in vegetation collected from the reference area is 1/2 the detection limit (0 039 mg/kg, wet weight)
LOAEL from Table D-1
Sediment and water ingestion rates not determined

Manatee - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc. in Vegetation (mg/kg)	Percent Vegetation in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	LOAEL (mg/kg/day)	HQ
Reference	0 08	NA	0 00	0 00	NA	0.00	0.01	1 00	50.00	0.50	1.00	500.00	0.00	0.13	0.01
LCP 17-18	56 00	NA	0 00	0 00	NA	0.00	1.00	1 00	50.00	50.00	1.00	500.00	0.10	0.13	0.77
LCP 35	70.00	NA	0 00	0 02	NA	0.00	5.13	1.00	50.00	256.50	1.00	500.00	0.51	0.13	3.95

Sediment concentration in mg/kg, dry weight (Table 3)
Vegetation concentration in mg/kg, wet weight (Table 43)
Food ingestion rate in mg/kg, wet weight (Table B-1)
LOAEL from Table C-1
Sediment and water ingestion rates not determined

Manatee - Mercury

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Vegetation (mg/kg)	Percent Vegetation in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0 13	NA	0 00	0 00	NA	0 00	0 02	1.00	50 00	1 00	1.00	500.00	0.00	8.00	0.00
LCP 17-18	15 00	NA	0 00	0 00	NA	0 00	0 56	1 00	50 00	28.00	1.00	500.00	0.06	8.00	0.01
LCP 35	90 00	NA	0 00	0 01	NA	0.00	2 60	1.00	50.00	130.00	1.00	500.00	0.26	8.00	0.03

Sediment concentrations in mg/kg, dry weight (Table 9)
Vegetation concentration in mg/kg, wet weight (Table 43)
Food ingestion in mg/kg, wet weight (Table B-1)
Concentration of mercury in vegetation from the reference area is 1/2 the detection limit (0 039 mg/kg, wet weight)
Acute value from Table D-1
Sediment and water ingestion rates not determined

Manatee - PCBs

Location	Conc in Sediment (mg/kg)	Sediment Ingestion Rate (kg/day)	Total Sediment (mg/kg/day)	Conc in Water (mg/L)	Water Ingestion Rate (L/day)	Total Water (mg/L/day)	Conc in Vegetation (mg/kg)	Percent Vegetation in Diet	Food Ingestion Rate (kg/day)	Total Food Conc. (mg/kg/day)	AUF	Body Weight (kg)	Dose (mg/kg/day)	Acute Dose (mg/kg/day)	HQ
Reference	0 08	NA	0 00	0 00	NA	0 00	0 01	1.00	50 00	0.50	1.00	500.00	0.00	3.30	0.00
LCP 17-18	56 00	NA	0 00	0 00	NA	0 00	1 00	1 00	50 00	50.00	1.00	500.00	0 10	3.30	0.03
LCP 35	70 00	NA	0 00	0 02	NA	0.00	5.13	1.00	50.00	256.50	1.00	500.00	0.51	3.30	0.16

Sediment concentration in mg/kg, dry weight (Table 3)
Vegetation concentration in mg/kg, wet weight (Table 43)
Food ingestion rate in mg/kg, wet weight (Table B-1)
Acute value from Table C-1
Sediment and water ingestion rates not determined