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Ms. Judith Enck
Regional Administrator
U.S. Environmental Protection Agency
290 Broadway
New York, New York 10007-1866

Dear Regional Administrator Enck:

The U.S. Fish and Wildlife Service (Service) has completed its review of an application to the New Jersey Department of Environmental Protection (NJDEP File no. 16009-09-0006.1) for a New Jersey Freshwater Wetlands Protection Act Permit (N.J.A.C. 7:7A) and Flood Hazard Area Control Act Permit (N.J.A.C. 7:13). The applicant, E.I. DuPont de Nemours and Company, proposes to remediate the Pompton Lake Acid Brook Delta Area, pursuant to the Resource Conservation and Recovery Act of 1976 (P.L. 94-580)(90 Stat. 2795; 42 U.S.C. 6901-6992), in the Borough of Pompton Lakes, Passaic County, New Jersey (Project). The New Jersey Field Office received a letter dated December 21, 2011 from Mr. Mario Del Vicario, Chief, Watershed Management Branch, US Environmental Protection Agency (EPA) requesting that we indicate our intent to comment on the above State permits. On January 5, 2012, the Service notified Mr. Montella, Chief, Wetlands Protection Section, EPA, of the Service's intent to comment on the Project and to provide our input directly to you within 50 days or by February 9, 2012.

The application is being submitted for approval to implement a New Jersey Department of Environmental Protection (NJDEP)-approved remedial action in the Pompton Lake Acid Brook Delta (ABD) Area to address chemical releases from the DuPont Pompton Lake Works (PLW) Site. The Project involves removal of sediment and soil from the ABD and adjacent wetlands and uplands. Remedial activities will occur within 29.02 acres and temporarily disturb regulated areas including 1.02 acres of freshwater wetlands, 1.21 acres of wetlands transition areas, 246 linear feet (0.1 acre) of State open waters (Acid Brook), 26 acres of State open waters (the ABD area of Pompton Lake), and 2.13 acres of riparian zone. The application indicates that the remediated area will undergo restoration to pre-existing or enhanced conditions following the removal action. The Project will also relocate the acid brook stream channel approximately 100 feet to the west where it meets Pompton Lake.

AUTHORITY

Service comments on the proposed activity have been prepared in accordance with the Section 404 State Program regulations (40 CFR Part 233.50) of the Clean Water Act (CWA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended (42 U.S.C. 9601 *et. seq.*), and are consistent with the Service's Mitigation Policy (Federal Register, Vol. 46, No. 15, Jan. 23, 1981). These comments are intended for the protection of fish and wildlife, and for your use in determining compliance with the Section 404(b) (1) Guidelines of the CWA. The Service's Mitigation Policy and the Section 404(b) (1) Guidelines emphasize that avoidance and minimization precede compensation, which is to be considered solely for unavoidable adverse impacts on fish and wildlife resources and their supporting ecosystems. Further, these comments on the proposed activity have been prepared under the authority of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA). These comments do not preclude separate Service review and comment pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*) and National Environmental Policy Act (83 Stat. 852, as amended; 42 U.S.C. 4321 *et seq.*) (NEPA), should this proposed action constitute a major Federal action requiring preparation of an Environmental Impact Statement or should the proposed action require additional Federal authorization.

FEDERALLY LISTED SPECIES

On February 7, 2012, the Service concluded that the Project would not likely adversely affect a listed species but asked the applicant to restrict clearing activities for trees > 5" diameter base height (dbh) from April 1to September 30 to avoid incidental take of any Indiana bats that may roost in the Project area. No further consultation pursuant to Section 7 of the ESA is required by the Service. If project plans change or new information on federally listed threatened or endangered species becomes available, this determination may be reconsidered.

AQUATIC IMPACTS

As a Natural Resource Trustee under CERCLA, the Service has a compelling interest in ensuring that natural resources are protected from exposure to hazardous substances. Our Trusteeship includes fish, wildlife, and other biota, as well as the habitats that support them. The Service therefore appreciates the opportunity to comment on this beneficial Project. We recommend that the US Environmental Protection Agency (EPA) and NJDEP seek early involvement from the Service on all remediation projects that may impact fish and wildlife resources in New Jersey, so that we can better assist in the coordination process. To do otherwise may impact our ability to provide timely coordination of projects of mutual interest and may require changes in project design and clean up.

In regards to the proposed Project, the Service recognizes the importance of remediating contaminated soil and sediment in Pompton Lake, particularly within the ABD, where concentrations of several chemicals, including mercury, lead, copper, selenium, and zinc, are significantly elevated above thresholds considered protective for human and/or ecological health. Therefore, the Service believes the remedial activities to be performed for this Project are an important first step in addressing legacy contamination from the PLW that may cause harm to natural resources. However, the Service does not believe that the proposed remedial action, as currently planned, will completely address historical releases nor be sufficient to protect against future injury to Federal trust resources from residual contamination originating from the PLW. Our reasons for this are outlined in the section below entitled "Contaminant Issues." The Service may consider performing a Natural Resource Damage Assessment (NRDA) to evaluate potential injury to Trust resources from historical exposure and residual contamination following the proposed remedial action, and we have initiated contact with the Applicant in that regard.

While we are supportive of the removal and restoration activities, we offer the following specific comments on the permit application to provide additional protection to Trust resources from contaminant impacts and enhance habitat quality following restoration.

1. The Permit Application includes limited information regarding remedial protocols. However, it appears from the ABD Revised CMI Work Plan (Arcadis *et al.* 2011) that the Work Plan address many issues of potential concern to the Service, including methods of containment, treatment, and disposal of contaminated media; staging methods; potential groundwater infiltration; erosion control methods; and water column monitoring of suspended solids. The Service strongly recommends strict adherence to the Work Plan, along with the use of Best Management Practices, to ensure that contaminant releases do not occur.

2. The proposed remediation involves removing contaminated sediment and soils and subsequently placing a sand cap ("eco-layer") to a depth of six inches. However, the potential exists for contaminant loss from under and through a sand cap's interstitial water, particularly via gas phase loss/transport, which can affect toxicity and bioaccumulation in benthic organisms. In addition, perturbation, whether induced by current, wind, or biota, can result in disturbance to sand caps over time. Therefore, the Service recommends the thickness of the cap be increased to a minimum of 12 inches to prevent disturbance and mixing of the cap and contaminated sediment below.

3. Include appropriate decontamination procedures for staging and remediation activities to prevent tracking contamination outside the zone of remediation.

4. A post-remediation contaminants monitoring plan is necessary to ensure that there is no re-contamination of the water, sediment, and soils (either from within or outside the project area) following remediation and restoration. Contamination should be monitored for a minimum of five years post-remediation. Corrective action measures should be developed to deal with potential contaminant issues arising post-remediation.

5. Provide additional information in the Application regarding how wildlife (i.e., fish and turtles) will be safely captured and relocated prior to remediation.

6. Typical of reforestation and restoration efforts in New Jersey, the Service requests the applicant agree to the following habitat restoration conditions as part of any permit authorizing the subject work:

a) Submit an as-built drawing within 60 days following completion of all construction and planting activities. The drawings must show adherence with all post construction grades as specified in their (undated) Grading and Landscape Plan (RP-41). Please include photographs of the completed site, planting zones established, densities achieved, and as-built elevations of all post-construction grading. Special attention must be paid to meeting a post construction grade for all hydric-dependent vegetation.
b) Submit an annual monitoring report by the end of each growing season (no later than December 31 of any given reporting year) detailing a progress report of the Project's success (See item a above for the minimum reporting requirements).
c) Ensure success of all planting efforts for a minimum of five years. Demonstrate 65% areal coverage of all vegetation by the end of the first year; 75% by the end of the third growing season; and 85% by the end of the fifth growing season.
d) Install sufficient animal browse deterrents until the planting areas are sufficiently established and not in danger of being browsed upon.
e) Develop a plan for the eradication of any invasive species that may be transported into the Project area. This plan shall include the annual monitoring for invasive species and a corrective action plan should any invasive species be identified. Demonstrate that no more than 10% cover in the re-vegetated areas is made up of invasive species at the end of the fifth growing season.
f) Any deviation from the approved planting plan shall be re-coordinated with the action agency prior to any modifications being implemented.
g) Establish a long-term management plan for the continued success of the Project. This will include a perpetual conservation easement for the Project site, the identification of a long-term steward for the Project site, and a maintenance fund for maintenance and supervision of all restoration areas. The steward can be a public resource agency or not-for-profit conservancy, subject to approval by the lead action agency.

CONTAMINANT ISSUES

Although the Service supports the proposed sediment/soil removal and restoration and provides the recommendations above to reduce impacts of the proposed Project to fish and wildlife resources, we also believe significant levels of contamination will remain. Our primary reasons are outlined below. The discussion focuses on mercury, which in certain forms is highly toxic and biomagnifies via the food web and is therefore of particular concern in terms of potential impacts to fish and wildlife resources in the vicinity of the ABD.

1) **Concerns with the Ecological Assessment methodologies, which are used as the basis for the Remedial Action Objectives (RAOs):**

While the Ecological Assessment (EA) used measured tissue concentrations to evaluate risk to fish, risk estimates for birds were obtained using oral dose models (Exponent 2003). The approach used literature-based inputs for factors including migration status, home range size, habitat use, diet, prey size, body mass, and food, water, and sediment ingestion rates to estimate the dose of contaminants consumed by the species evaluated (great blue heron, mallard, belted kingfisher, double-crested cormorant, and bald eagle). The estimated contaminant ingestion rates were then compared to no observable adverse effects levels

(NOAELs) and lowest observable adverse effects levels (LOAELs) to evaluate whether contaminants may have negative impacts on wildlife receptors. While the oral dose models in the EA included numerous life-history factors that affect contaminant intake, there was no site-specific field validation of the models (i.e., actual sampling of birds) that would quantify dietary uptake into avian fauna. There is a great deal of individual- and population-level variation in life-history traits; foraging area and prey selection in particular may be greatly affected by food availability, such that a given individual will forage primarily upon a particular food item and within a circumscribed portion of its overall foraging range (see, for example, Smith and Dawkins 1971; Krebs *et al.* 1974). If organisms are feeding more frequently on a contaminated food source, it may significantly affect the rate of contaminant uptake via prey ingestion. Given the complexity of the models used in the EA, it is likely that contaminant intake by birds at the site is quite different from that predicted. Further, oral dose NOAELs and LOAELs carry greater uncertainty than doses measured in tissues that are targets for toxic effects, given that absorption and bioavailability may vary between species or individuals, depending upon reproductive and nutritional status, sex, and a variety of other factors. Oral dose evaluations are also generally based on relatively short-term studies in which steady-state conditions are not achieved (EPA 1993). Thus, tissue residue data provide a more accurate assessment of both exposure and effects than oral dose models, since many of the variables determining actual oral dose, as well as oral dose responses, are "built in" to the tissue residue assessments. Recently published information on tree swallows and Carolina wrens provide excellent comparative examples of a tissue-based approach (Jackson *et al.* 2011a; Brasso and Cristol 2008). An important additional advantage to using tissue residue concentrations to assess potential toxicity from contaminants at the PLW Site is that such an approach can be used to determine the sediment values that would need to be attained to prevent tissue concentrations from reaching effect levels in species of concern. Briefly, site-specific biota-sediment accumulation factors (BSAFs) would be used in combination with tissue - and organism- specific threshold effect concentrations to back-calculate protective contaminant concentrations in sediment. A similar approach using oral dose models for birds was outlined in an internal NJDEP memo from Gary A. Buchanan, Bureau of Natural Resources Science Chief, to Frank Faranca, Site Manager, SRP, Bureau of Case Management (Buchanan 2008). Instead of the preceding approach, the Service advocates deriving clean-up goals from tissue residue concentrations, as they are more accurate in determining protective values than oral dose models.

In addition to concerns with the use of oral dose models, the Service believes that the effects thresholds used in the EA to evaluate risk to both fish and avian fauna are antiquated and not adequately protective. For fish, the risk evaluation used an adverse effects level for mercury of 4,000 micrograms per kilogram (4 milligrams per kilogram, or mg/kg) (Exponent 2003). According to a review by Beckvar *et al.* (2005), recent high-quality publications reveal lethal and sublethal effects in adult fish at concentrations well below 1 to 5 mg/kg. For example, Matta *et al.* (2001) found that adult male mummichog (*Fundulus heteroclitus)* with tissue concentrations of 0.2 to 0.47 mg/kg methylmercury suffered higher mortality rates than controls. Mercury's effects on early life stages, which have been found to be particularly sensitive to mercury, also do not appear to have been considered in the EA. For example, Birge *et al.* (1979) found that a waterborne concentration causing 50% mortality (the LC_{50}) in 4-day-old goldfish larvae equated to a tissue concentration of 0.06 mg/kg total mercury.

Based on these and other studies, Beckvar *et al.* (2005) identified a whole-body tissue concentration threshold of 0.2 mg/kg mercury as protective of both adult and early life stages for most fish species. Many of the fish species evaluated in Pompton Lake (black crappie, yellow perch, white perch, golden shiner, and largemouth bass) had tissue concentrations exceeding this threshold (Exponent 2003). The Service recommends using a more conservative effects threshold to ensure Trust resources are protected.

NOAEL and LOAEL values used in the EA to evaluate avian fauna are similarly non-conservative. The selected avian LOAEL is from reported toxicity to the common loon (*Gavia immer*); the EA notes that this value is very near a LOAEL identified for the mallard, and states that the apparent low interspecies variation in response at near-threshold concentrations justifies its application (Exponent 2003). However, the loon and the mallard are both considered less sensitive to mercury than many other species (Heinz 2009; Evers *et al.* 2011). Using data from Heinz *et al.* (2009; 2011) regarding species sensitivity to methylmercury injected into eggs, the mallard is one of the more insensitive of the 23 species evaluated (Figure 1). Sensitive bird species may not be protected using a risk threshold based on effects to the loon or mallard. In addition, the bird species evaluated, although frequently used in ecological risk assessments, are all relatively large bodied, which means they have lower mass-specific metabolic rates, and therefore lower mass-specific food ingestion rates, than smaller species (Bennett and Harvey 1987). Different groups of birds also vary in their feeding rates, with passerines generally having higher food requirements per unit mass than most other groups (Nagy 2001). Thus, the risk evaluations performed for the EA may not be as protective as assessments based on smaller passerine species. Recent studies have shown that passerine birds may bioaccumulate contaminants, including mercury, via ingestion of invertebrate prey, such as emergent aquatic insects and spiders, living in riparian habitats (Walters 2008; Cristol *et al.* 2008). Passerines likely to be present at Pompton Lake that have been shown to accumulate relatively high levels of mercury at other contaminated sites include rusty blackbirds (*Euphagus carolinus)*, tree swallows (*Tachycineta bicolor)*, Carolina wrens (*Thryothorus ludovicianus*), and marsh wrens (*Cistothorus palustris*) (Tsipoura *et al.* 2008; Brasso and Cristol 2008; Edmonds *et al.* 2010; Hallinger and Cristol 2011; Jackson *et al.* 2011a). Tree swallows and Carolina wrens in particular appear to be more sensitive to mercury impacts than the model species selected for the EA (Jackson *et al.* 2011a; Heinz 2009, 2011). Studies of mercury impacts to avian fauna performed under a cooperative Natural Resource Damage Assessment (NRDA) between the Service and DuPont at another DuPont Site (the South River, Virginia, where mercury was released from a DuPont facility operating in the 1930s and 1940s) have shown Carolina wrens to suffer dose-dependent reductions in reproductive fitness, with blood mercury concentrations as low as 0.7 micrograms per gram wet weight reducing reproductive success by 10% (Table 1). Finally, sublethal effects have been found to occur in birds at significantly lower concentrations than those affecting growth, reproduction, or survival, which were the criteria used to select the LOAELs used for the EA. For example, mercury may compromise the avian immune response (Fallacara *et al.* 2011), impair the ability of birds to withstand variable environmental conditions (Hallinger and Cristol 2011), disrupt endocrine function (Wada *et al.* 2009; Jayasena *et al.* 2011), and have subchronic effects on organ and blood biochemistry and pathology (Spaulding *et al.* 2000; Hoffman *et al.* 2005, 2009). Given the potential for effects to sensitive species and subchronic endpoints at low concentrations of mercury, the

Service does not concur with the conclusion that observed levels of methylmercury in biotic and abiotic media in the ABD and Pompton Lake do not pose risk to avian receptors.

In addition, risk to mammals was not investigated in the EA. Of particular concern are potential impacts to piscivorous mammals including mink (*Neovison vison*) and river otter (*Lutra canadensis*). Mercury has been reported to occur at elevated levels in mink living near other hazardous waste sites (Moore *et al.* 1999; Sleeman *et al.* 2010), and mink and river otter have been found to be sensitive to mercury toxicity (Aulerich *et al*. 1974; Wobeser and Swift 1976; Halbrook *et al*. 1994; Osowski *et al*. 1995; Halbrook *et al*. 1997; Dansereau *et al*. 1999). While not common in Passaic County, river otter and mink are at least occasionally present, according to NJDEP trapping records (NJDEP 2011). Without evaluating the potential risk to these and other mammalian receptors that may be present, it cannot be conclusively stated that the proposed remedial action will be protective of mammalian fauna.

In general, given the uncertainty regarding mercury tissue concentrations in sensitive populations (e.g., early life stages and related endpoints) of all ecological receptors with the potential to be exposed to contaminants released at the PLW, it is not clear that the remedial options would reduce risks to an "acceptable" level.

Finally, the Service has concerns with selection of reference locations used to evaluate the results of the benthic community and toxicity studies in the EA. The selected reference areas were located within Pompton Lake, albeit "upstream" from the ABD, near the top of the Lake's confluence with the Ramapo River. According to the Phase 1 Data Report for the ABD (PTI 1997), these locations were considered representative of background contaminant concentrations on the basis of water and sediment quality characteristics and water flow studies. Low contaminant concentrations in surface water at the proposed reference locations, along with similarities between concentrations at proposed reference locations and sampling sites upstream in the Ramapo River, were cited as justification for using the selected locations within Pompton Lake to represent background. However, while surface water contaminant levels were compared among the proposed reference locations and the Ramapo River upstream of Pompton Lake, sediment contaminant levels were not; surface water contaminant concentrations do not necessarily provide information regarding legacy contamination in sediment originating from the DuPont facility. According to the Phase 1 Data Report, water flow in Pompton Lake, despite being "generally southerly," was occasionally driven by wind in a direction counter to the typical flow (PTI 1997). Over time, given the fine-grained (50 to 95% fines) nature of the sediment in ABD (Exponent 2003), contaminated sediment could potentially have been transported and deposited within upstream areas of Pompton Lake, including those selected as the reference locations. Thus, there may have been no discernible difference between the toxicity of the proposed reference area and ABD sediments to benthic invertebrates because sediments from the proposed reference areas were sufficiently contaminated to induce toxicity. A comparison of Ramapo River sediment contaminant concentrations upstream of Pompton Lake to those of the proposed reference locations would have been worthwhile for evaluating whether Lake sediments outside of the ABD are affected by contamination from the PLW. Further, performing a benthic toxicity test using clean laboratory sediment as a control would have helped to discern whether the comparison between toxicity from the "reference" and ABD sediments was valid. Given that benthic toxicity studies did not include a clean laboratory control, and that it has not been clearly demonstrated that sediments at the "reference" locations are not impacted by contaminants from the Site, the Service does not believe that the results of the benthic community and toxicity studies are conclusive.

2). Concerns with Selection of Qualitative and Quantitative RAOs:

Qualitative RAOs for Sediment

Based on the results of the EA, the Remedial Action Selection Report concludes that the potential for unacceptable risk from contamination at the ABD is minimal (DuPont and URS Diamond 2009). This conclusion, along with the fact that there are no promulgated remediation standards for sediment, is used to support the development of qualitative RAOs for the ABD. Given the reasons outlined above, the Service does not concur that there is minimal potential for ecological risk. Therefore, we cannot support the conclusion that quantitative RAOs for sediment are not necessary to ensure the remedial action is adequately protective of fish and wildlife resources. As previously stated, the Service recommends using measured tissue concentrations in wildlife at the Site, along with conservative effects thresholds for sensitive species and site-specific BAFs, to develop quantitative RAOs for sediment.

Quantitative RAOs for Soils

According to the Revised Corrective Measures Implementation Work Plan (CMI WP) (Arcadis *et al.* 2011), the RAO for mercury in surface (0-0.5 ft deep) soils in the upland area will be 20 mg/kg, which represents the lower of the New Jersey Residential Direct Cleanup Remediation Standard (value = 23 mg/kg) and the ecological soil delineation criterion. The Revised CMI WP states that justification for the ecological soil delineation criterion is presented in the ABD Uplands Remedial Investigation Work Plan, which was not provided to the Service in time to be evaluated within the comment period allotted for this review. Therefore, the Service cannot adequately assess whether the proposed remediation standard will be protective of ecological resources. In its discussion of the RAOs, the Revised CMI WP states that the upland area is of limited value as an ecological habitat due to its size, fragmentation, and frequent disturbance; presumably, these factors are listed because they were considered in deriving the proposed soil criterion. However, given the potential for transport of contaminants to Pompton Lake via surface water run-off from upland areas, the fact that a substantial portion of what is considered the upland area is actually wetland, and the possibility of biological uptake via emergent and riparian invertebrates, as outlined above, the Service is concerned that the proposed RAO for mercury in upland soils will not be protective of natural resources.

3). Inadequate delineation of the extent of contamination:

A variety of documents were referenced during review of the proposed Project, including the Acid Brook Delta Ecological Investigation Reference Area Evaluation and Phase 1 Data Report (PTI 1997), the Acid Brook Delta Ecological Investigation Phase 2 Report (Exponent 2003), the Draft Remedial Action Proposal For Acid Brook Delta Sediments (DuPont and URS Diamond 2006), the Acid Brook Delta Remedial Investigation Report (DuPont and URS

Diamond 2008), the Acid Brook Delta Area Remedial Action Selection Report / Corrective Measures Study (DuPont and URS Diamond 2009), and the Acid Brook Delta Area Revised Corrective Measures Implementation Work Plan (Arcadis *et al.* 2011). None appeared to present any assessment of the extent of contamination beyond the boundaries of the Acid Brook and Pompton Lake. Areas with surface sediment contamination between 2 and 20 mg/kg were identified up to and including the sampling area most proximal to the dam (DuPont and URS Diamond 2009). Mercury tends to adsorb to fine-grained sediments and long-range transport of fine-grained sediments may occur during high flow periods (Eisler 1987; Jackson *et al.* 2011b). Given the fine-grained nature of sediment in the ABD, contamination downstream of the dam should be assessed to determine if mercury has been transported beyond the dam at Pompton Lake to downstream areas of the Ramapo River. Studies of other mercury-contaminated riverine systems have shown that contamination may extend far downstream of the original source, due both to transport of abiotic media and to bioaccumulation in mobile organisms. For example, studies of the South River Site found elevated mercury levels (> 25 mg/kg dry weight) as far as 25 miles downstream from the original source (Virginia Department of Environmental Quality, 2007 unpublished data). Mercury released into the aquatic environment has also been shown to enter terrestrial food webs through biological uptake by emergent aquatic and riparian organisms (Cristol *et al.* 2008). Studies of the biological transfer of mercury along the South River revealed elevated levels of mercury in the blood of terrestrial forest songbirds sampled up to 137 kilometers downstream of the original source, and there was little evidence that blood mercury concentrations declined with distance (Jackson *et al.* 2011b). At other mercury-contaminated sites, bioaccumulation factors (BAFs) were found to rise as the level of contamination in abiotic media decreased (Brent and Kain 2011), with the result that target media concentrations for areas with low contamination derived using BAFs measured for areas with higher contaminant concentrations were not protective. In other words, even if mercury concentrations downstream of the dam are lower than those in Pompton Lake, bioaccumulation may be higher and extend a considerable distance from the original source. Contaminant concentrations in abiotic media and biota downstream of Pompton Lake need to be assessed to determine whether additional remedial measures are necessary. Further, Pompton Lake was only delineated to a sediment concentration of 2 mg/kg, which is approximately four times the concentration considered to represent background (Buchanan 2008). Thus, part of the footprint of the extent of contamination includes areas outside the ABD with mercury concentrations between 0.5 mg/kg and 2 mg/kg, but remedial activities do not appear to be planned for these areas.

SERVICE RECOMMENDATIONS AND CONCLUSIONS

The Service is concerned that the EA does not accurately or adequately predict risk to ecological resources from exposure to contaminants released from the DuPont PLW. Therefore, we believe the proposed remedial action, which is based in large part upon the conclusions of the EA, will leave residual contamination that may result in injury to fish and wildlife. Despite these concerns, the Service supports the proposed Project, which we believe to be an important first step in improving habitat quality in Pompton Lake and downstream by removing a significant proportion of the contaminant load in the ABD and upland habitats. We recommend the Applicant commit to incorporating the Service recommendations regarding remedial and habitat restoration activities listed beginning on page 4 of this letter. We also recommend further evaluation of the extent of contamination be performed for the area outside the Acid Brook and ABD areas. The Service may consider pursuing NRDA activities to determine whether Trust resources have been or will continue to be impacted by contamination from the PLW.

The Service appreciates the opportunity to comment on the referenced project. Should you have any question on the above, please contact Melissa Foster for all contaminant related issues and Steven Mars for all restoration comments at 609-383-3938 x 21 or 23, respectively.

J. Eric Davis Jr.
Field Supervisor

Attachments (2)

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Table 1. Carolina Wren blood, feather, and egg mercury effects concentrations (ww = wet weight) associated with the MCESTIMATE-modeled reduction in nest success. Results based on data collected in 2010 from nests along the South River in Virginia. From Jackson et al. (2011a).

Reduction in nest success [a]	Blood mercury ($\mu g\ g^{-1}$, ww)	Body feather mercury ($\mu g\ g^{-1}$, ww) [b]	Tail feather mercury ($\mu g\ g^{-1}$, ww) [c]	Egg mercury ($\mu g\ g^{-1}$, ww) [d]
10%	0.7	2.4	3.0	0.11
20%	1.2	3.4	4.7	0.20
30%	1.7	4.5	6.4	0.29
40%	2.1	5.3	7.7	0.36
50%	2.5	6.2	9.1	0.43
60%	2.9	7.1	10.4	0.50
70%	3.3	7.9	11.8	0.57
80%	3.8 [e]	9.0	13.5	0.66
90%	4.4 [e]	10.3	15.5	0.76
99%	5.6 [e]	12.8	19.5	0.97

[a]Calculated using MCESTIMATE, comparing probability of fledging at least 1 young at 0 $\mu g\ g^{-1}$ to the probability of fledging at least 1 young at each contaminated blood concentration.

[b]Calculated using the regression equation [body feather Hg] = 2.1407974[blood Hg] + 0.8531665.

[c]Calculated using the regression equation [tail feather Hg] = 3.3762108[blood Hg] + 0.6427166.

[d]Calculated using the regression equation [egg Hg] = 0.1748381[blood Hg] – 0.007394.

[e]Extrapolation past known blood mercury levels using the MCESTIMATE model.

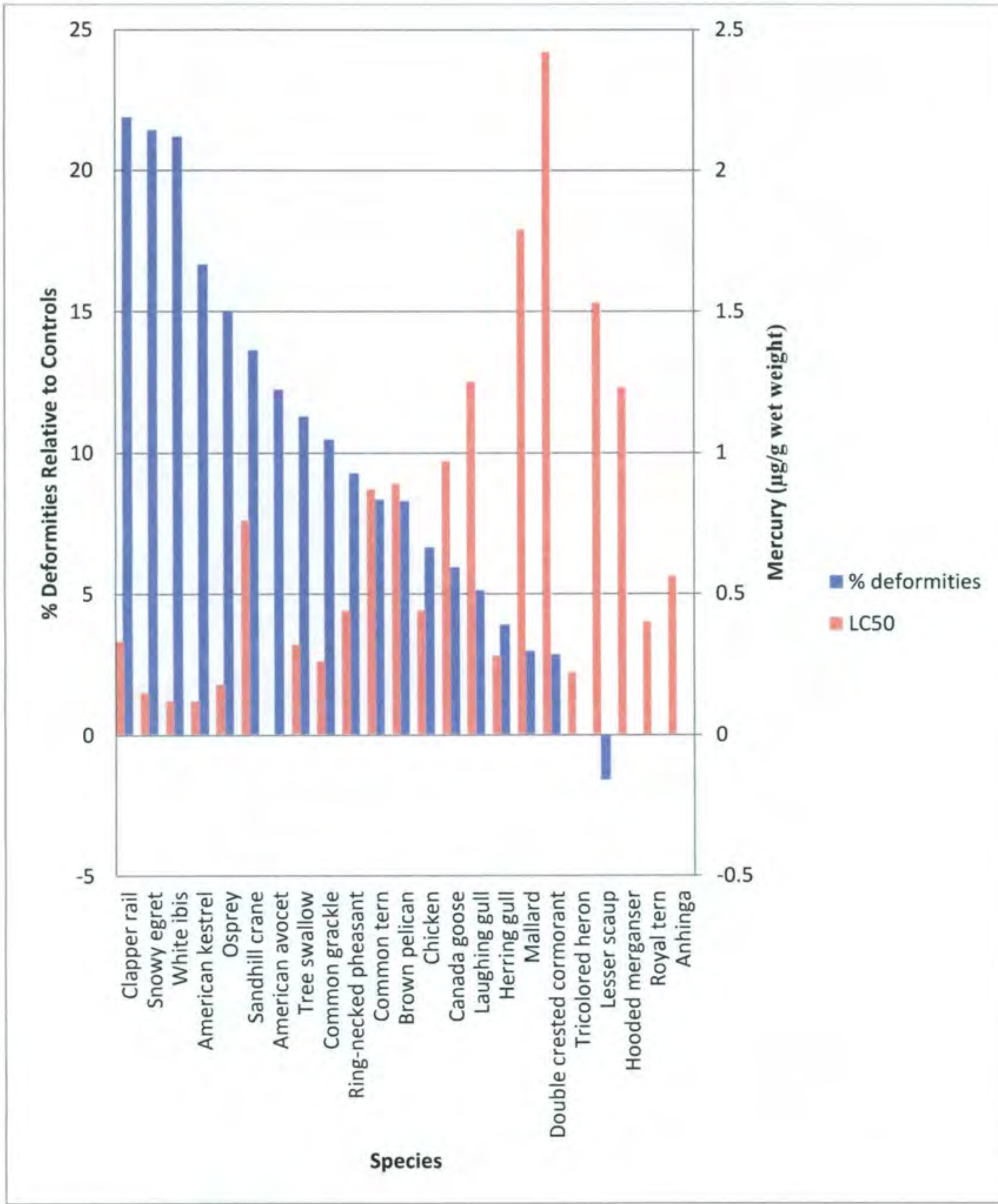

Figure 1. Sensitivity Distribution of Avian Species to Methylmercury Injection. Eggs were injected with untreated corn oil (control) or to groups dosed with 0.05, 0.1, 0.2, 0.4, 0.8, 1.6, 3.2, or 6.4 micrograms per gram methylmercury on a wet-weight basis in the egg. Blue bars represent the percent of hatchlings or embryos with one or more deformities within all mercury treatment groups combined, minus the percent of hatchlings or embryos with one or more deformities in control eggs. Only species with sample sizes >10 for both control and experimental treatments are presented. Peach bars represent the concentration at which 50% of the study population died (LC_{50}). The most sensitive species are those with high blue bars and low peach bars. Data from Heinz et al. (2009; 2011).