UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
National Centers for Coastal Ocean Science
Silver Spring, Maryland 20910

MEMORANDUM FOR: The Record

FROM: Mary Culver
Acting Deputy Director
National Centers for Coastal Ocean Science

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SUBJECT: Environmental Review Memorandum for RESTORE Act Funded project #3123551 "Co-producing a conceptual model to support assessments of cumulative effects from multiple stressors on Houston area dolphins under CERCLA and OPA."

NOAA Administrative Order (NAO) 216-6A, Environmental Review Procedures for implementing the National Environmental Policy Act (NEPA), requires all proposed projects undergo review with respect to environmental consequences on the human environment. This memorandum addresses the determination that proposed activities during the RESTORE Science Program funded project, "Co-producing a conceptual model to support assessments of cumulative effects from multiple stressors on Houston area dolphins under CERCLA and OPA" activities are adequately addressed by the analysis in the *Programmatic Environmental Impact Statement for the Marine Mammal Health and Stranding Response Program*, and does not require further NEPA review.

Environmental Compliance Background

In 2022, pursuant to the National Environmental Policy Act (NEPA) and the Council on Environmental Quality Regulations (CEQ), the Marine Mammal Health and Stranding Response Program (MMHSRP) published a PEIS analyzing the effects of their activities on the human environment. Initially written in 2009, several changes were made to increase efficiency and improve public health and safety during marine mammal entanglement response, stranding response, rehabilitation, and release of animals back to the wild, and additional scientific information on the effectiveness of activities and mitigation measures has been collected. Using a programmatic approach, the MMHSRP identified and prepared a new qualitative analysis of environmental impacts covering a range of activities conducted in support of its activities, and a new Marine Mammal Protection Act (MMPA)/Endangered Species Act (ESA) scientific research and enhancement permit. This new analysis (final PEIS) superseded the 2009 PEIS and assesses the potential environmental effects of MMHSRP activities under a range of three alternatives, characterized by different methods, mitigation measures, and levels of response.

NCCOS Determination

Based on the analysis contained in this document, NCCOS determines that there is no requirement for additional analysis under NEPA for this action. NCCOS bases this determination on the analytical comparison between the activities conducted in this project and the activities covered in the MMHSRP PEIS in Sections 9.2.1.1, 9.2.6, and 9.2.7. In addition, project PIs have permits to Take Protected Species for Scientific Purposes for these research activities from the National Marine Fisheries Service (No. 23203-1 and 24359), authorizing biopsy sampling of bottlenose dolphins and taking photos using UAS (in accordance with applicable local permits to use UAS).

Purpose and Need

NOAA's Damage Assessment, Remediation, and Restoration Program evaluates information on releases of oil and hazardous substances into coastal environments for the purpose of natural resource damage assessment (NRDA) decision making. They must evaluate whether or not to pursue NRDA claims for restoration of Houston area bottlenose dolphins potentially injured by releases of polychlorinated biphenyls (PCBs) and dioxins. Addressing data gaps about how co-exposures may lead to cumulative effects and then incorporating that knowledge into the existing conceptual model would benefit the decision-making process.

In the coastal waters near Houston (Galveston Bay and adjacent waters; hereafter "the Houston area"), common bottlenose dolphins (*Tursiops truncatus*; hereafter "dolphins") live in an industrialized waterway that supports one of the largest petrochemical complexes and ports in the world. The area is the focus for multiple NRDAs, both ongoing and prospective, and dolphins are a species of particular interest. A NMFS risk assessment scored three groups of dolphins in the area as high research priorities. Federal, State, and non-profit agencies have conducted surveys of both contaminants in the Galveston Bay System (e.g., for dioxins and polychlorinated biphenyls [PCBs]) and of dolphin sightings, but little is known about contaminant loads in Houston area dolphin tissues and dolphin survival rates. Furthermore, the combined dose-response effects from these contaminants on wildlife is poorly understood.

The proposed project will provide information on the: 1) current body burdens of PCBs and dioxins in the blubber of Houston area dolphins; 2) survival rates of Houston area dolphins compared to others in the Southeast U.S.; 3) relationship between the health (biological age) of Houston area dolphins and their chronological age; and 4) potential interaction (e.g., additive, synergistic, or antagonistic) between the toxic effects of dioxins and PCBs on the hypothalamus-pituitary-thyroid (HPT) axis.

To do this, the project will: 1) analyze blubber samples from previous remote biopsy surveys and from new remote biopsy surveys and compare the data to ranging patterns and across demographic groups; 2) conduct bi-annual surveys to inform spatial capture-mark-recapture analysis and compare population survival rates to other populations in the Southeast U.S.; 3) collect remote biopsy skin samples and analyze epigenetic profiles to estimate chronological and biological ages (a discrepancy between the two ages may be indicative of chronic effects from dioxins and PCBs); and 4) conduct laboratory exposures with cell lines to better understand the dose-response relationships of dioxins alone, PCBs alone, and both chemicals together. NRDA decision makers will be key participants in the project from start to finish. The project team will co-produce statistical models, analyses, and conceptual models that can be updated based on additional data/assumptions that they or others may collect in the future. Thus, decision makers will be armed with scientifically-sound information to design more specific and targeted studies for their particular cases/assessments, and anyone conducting risk assessments of other potential stressors in the Houston area (e.g., The Bolivar Roads storm surge barrier) will have more context to effectively evaluate cumulative effects to marine mammals.

Geographic Scope

Remote dolphin biopsies and aerial surveys will be conducted within the orange box in Figure 1, in the Galveston Bay, specifically targeting dolphins near where the Houston Ship Channel opens into Upper Galveston Bay.

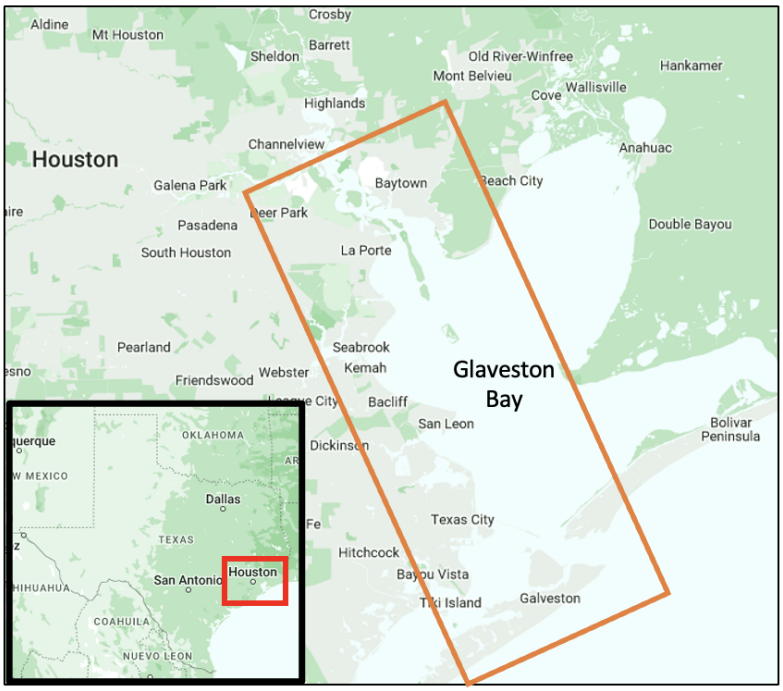

Figure 1: Anticipated sampling area

Activity Description

Remote Biopsies

In Year 2 of the project, PIs will collect 15-30 dolphin mammal blubber samples, targeting dolphins near where the Houston Ship Channel opens into Upper Galveston Bay.

When a group of dolphins is sighted, it is approached for data collection and to determine suitability for sample collection. Circumstances that would potentially eliminate a group from consideration include: presence of one or more neonates or very young calves (< 1 year old); stress reactions by one or more dolphins; and/or a group primarily composed of previously sampled dolphins. If the group proves suitable, the sampler prepares the sampling device, un-wraps a dart, and rinses it in ethanol. When the sampler is ready for a sampling attempt and a shot is imminent, a photographer focuses on the same dolphin as the sampler. At this time, documenting the impact of the dart as well as the dorsal fin of the target dolphin is the primary responsibility of the photographer.

To collect a biopsy sample from a cetacean from a small boat, the sampler aims a modified crossbow at the flank of the dolphin below the dorsal fin and above the midline. The target animal should be perpendicular to the sampler when the shot is fired, so the dart impacts the dolphin as flush as possible. From the bow of the ship, the biopsy should be collected from an area near the middle of the animal near the dorsal fin and well behind the blowhole. Sampling distances are typically 3-10m. When a shot is taken, the data recorder records a GPS waypoint and completes a data sheet. Records are collected whether or not a sample is collected. After a shot is taken, the dart is retrieved as efficiently and safely as possible. The floating untethered dart is retrieved by hand from the water's surface.

UAS Surveys

The project will conduct three surveys (in Years 1, 3, and 5) to inform spatial capture-mark-recapture (CMR) analysis, allowing the investigators to estimate population 2-year and 5-year survival rates across the five-year project period. The study design will be based on robust CMR surveys, similar to those the team has performed previously. Each year's survey, or primary session, will include up to 12 on-water

days in order to cover transects across the Houston area waters three times (three secondary sessions per primary session) during the late summer (a time when wind should be relatively low). Four boats will be used with crews experienced in photo-identification methods, and they will operate under existing NOAA permits and standard protocols/best practices.

Laboratory Analysis
Blubber samples from previous remote biopsy surveys and from a new remote biopsy survey will be analyzed to better understand average contaminant loads (both PCBs and dioxins) across the population, as well as individual doses compared to each animal's ranging pattern (via sightings history) and health (via epigenetics). The project will compare contaminant loads across sex, age, and reproductive life-history parameters of Houston area dolphins, as well as with other dolphin populations across the Southeast U.S. (SEUS). Blubber samples from remote surveys and existing samples will be analyzed at an analytical chemistry laboratory at Texas A&M University.

Laboratory exposures with cell lines will be conducted to better understand the physiological impacts of dioxins alone, PCBs alone, and both chemicals together. The team will focus on commercially-available human, primate, and/or rodent cell lines with reasonable HPT signaling pathway behavior, which will maximize the number of established kits, reagents, and assays available for the endpoints of interest.

Epigenetic markers from skin tissue will be analyzed to evaluate the overall health of the dolphins. The same set of biopsy samples from our analytical chemistry analysis will be evaluated, and PIS will work with collaborators at The Clock Foundation for the epigenetics analysis (n = 96 samples, i.e., one microwell plate).

Environmental Consequences
The scope of project activities are covered in Chapter 9 of the MMHSRP Programmatic Environmental Impact Statement. The PEIS covers the environmental impacts of:

- UAS flights closely approaching marine mammals to conduct assessments, monitoring, photo-identification, photogrammetry, sample collection, and behavioral observations
- Vessels approaching marine mammals for assessment, monitoring, photo-identification, sample collection, and behavioral observation.

Environmental impacts of project activities are described in Section 9.3 of the PEIS.

Vessel Use
Biomonitoring and research activities could result in minor, short-term, adverse effects on all biological resources from vessel and vehicle uses during biomonitoring and research activities. Accidental spills of hazardous materials from vessels could impact biological resources, and some materials could be diluted quickly by currents, only causing temporary impacts. Other materials could linger in the water column or adhere to sediment particles, causing slightly longer impacts. Potential minor adverse effects on protected and sensitive habitats could include damage from vessels, anchors, or researchers in the water. Every effort will be taken to avoid protected and sensitive habitats, such as coral reefs, during biomonitoring and research activities. This project will not take place in sensitive habitats where coral reefs could be present.

Negligible, short-term adverse effects on submerged aquatic vegetation (SAV) and macroalgae could occur during research activities. Vessels used during research activities conducted in shallow waters may damage SAV and macroalgae with propellers and anchors. Any damage to SAV or macroalgae is expected to be negligible and short-term, as only a minimal amount would be disturbed and would grow back within a few weeks to months. Damage to SAV rhizomes is not likely to occur, as boat operators will adhere to Best Management Practices.

Minor, short-term effects on coastal and marine birds could occur. Close approaches by vessels or aircraft and the use of equipment could disturb birds on the beach. Project activities will take place entirely in the water, so no effects to marine birds are expected.

Beneficial and adverse effects on marine mammals could occur. Indirect beneficial effects would occur because valuable information on dolphins and their health trends will be collected.

Cetaceans may suffer negligible temporary adverse impacts as result of close approach for non-invasive research. The potential reaction of the animal is limited to disturbance, with the animal becoming alert and/or moving away from the vessel, aircraft, or research personnel, swimming faster, breaching, diving, tail and fin slapping. Cetacean reactions to aerial surveys depend on the aircraft's altitude, speed, time spent overhead, and species or individual behaviors. Approaches to marine mammals below certain altitudes could harass marine mammals and cause a change in behavior, or elicit behaviors, such as diving rapidly. Behavioral responses to close approaches by vessel or aircraft would generally be temporary with a negligible effect on the individual or the population.
Unintentional (incidental) harassment of non- target marine mammals may also occur during biomonitoring and research activities, resulting in indirect temporary, negligible indirect adverse effects. The impacts to non-target marine mammals would typically be the same as the impacts from close approaches, described above under non-invasive research. Indirect adverse impacts to non-mammalian species (e.g., sea turtle, fish, birds, etc.) are also mostly anticipated to be negligible and temporary, as these species may experience some stress and flee from the area when biomonitoring and research activities are conducted.

Remote Biopsies
Dolphin biopsies may be conducted via remote methods or surgically. A careful approach generally elicits, at most, a minimal and short-lived response from cetaceans; even those that are sampled using remote biopsy procedures. A NMFS biological opinion concluded that, based on existing data and published research, biopsy sampling on cetaceans (via crossbow, compound bow, dart guns, or pole spears) would not have long-term major adverse effects on the target individual (NMFS 2019b). Published research has shown that short-term negligible adverse effects of biopsy darting on cetaceans could cause a startling reaction or be momentarily painful to the animal, and that serious trauma and/or death are unlikely (Noren and Mocklin 2012). There is a small possibility of moderate to major short-term and long-term adverse impacts to individual small cetaceans.

In a recent 2020 case involving a small cetacean, a bottlenose dolphin died from an infection resulting from a biopsy dart that missed the target site and accidentally struck the dorsal fin. Mitigation measures have been added to all scientific research and enhancement permits to minimize the likelihood that biopsy darts miss the target sampling site and accidentally strike the dorsal fin, to reduce potential for infection. For this project, NMFS Permit #23203-01 and Permit #24359 state additional mitigation measures PIs must take, such as only attempting remote biopsy sampling 3 times per dolphin, and discontinuing sampling attempts if the dolphin displays adverse behavior to the activity or vessel. If a dorsal fin is hit, the Permits Division and MMHSRP must be notified within 2 days, and researchers must make reasonable efforts to conduct post-biopsy monitoring until the biopsy wound is healed through tracking and resightings (photographic/video or genetic), as feasible, to assess:
a. Location of the biopsy wound site in the dorsal fin;
b. Biopsy wound reaction and healing (e.g., coloration, swelling, open wounds, signs of infection or necrosis)
c. Animal body condition, apparent health, and behavior; and
d. Fecundity (presence and survival of calf).

Results of post-biopsy monitoring of these dolphins must be provided in annual reports as

indicated in Permit Condition III.E.5.

Institutional Animal Care and Use Committee (IACUC) approval and the approved IACUC protocols must be submitted to the Permits Division prior to conducting research under Tables A1 or A2 of Appendix A.

UAS Surveys
UAS cause minimal disturbance due to their relatively small size, minimal noise, and strategic use. UAS operations have been integrated into numerous field studies involving a variety of marine mammal species and cause substantially lower levels of disturbance than traditional aircraft when flown at comparable heights.

A recent study on bottlenose dolphins found that animals were significantly more likely to react to UAS activities when the vehicle was closer than 25 meters (Fettermann et al. 2019). Conversely this did not appear to be the case for larger cetaceans as minimal or no disturbance was documented at heights above 12 meters for blue, gray, humpback, and sperm whales. The magnitude of the temporary, negligible adverse impacts from the use of UAS for non-invasive research are variable between different species of cetaceans.

The Magnuson-Stevens Fishery Conservation and Management Act requires that federal agencies consult with the National Marine Fisheries Service on actions that "may adversely affect" essential fish habitat (EFH) *(16 U.S.C. § 1855(b)(2))*. Impacts to Essential Fish Habitat are covered in Section 9.4.1.3: Mitigation measures for other biological resources. Research activities would avoid essential fish habitat (EFH), including SAV and coral reefs, as much as possible. If operating in areas with SAV, coral reefs, or other EFH, vessel operators would be aware of potential impacts to these habitats, and would avoid grounding vessels or anchoring on top of fragile habitats such as SAV and coral reefs.

This project will include vessel activities off the coast of Galveston Texas and in the upper Galveston Bay and UAS activities. UAS activities will not adversely affect EFH as these will not take place in the water. Vessel activities will not adversely affect EFH. According to the NOAA Habitat Conservation EFH mapper, species with EFH in the Galveston Bay area are: Shrimp, Red Drum, Reef Fish, Coastal Migratory Pelagics, Bonnethead shark (neonate), Bull shark, Spinner shark (neonate), and Blacktip shark (Neonate).

There are no Habitat Areas of Particular Concern in the project area.

NCCOS determines that project activities will have no effect on Essential Fish Habitat. Vessel activities will not cause an increase in vessel traffic in the area and will not block fish migratory pathways or disrupt access to food sources. Vessel activities will be small in scope and scale and PIs and vessel operators will not anchor in sensitive habitats.

Cultural Environment – Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their actions on historic resources (16 U.S.C. §§ 470 et seq). No historic resources are present in the action area.

Protected or Managed areas – The project activities will not take place in a National Marine Sanctuary, Marine Protected Area, or National Wildlife Refuge.

Coastal Zone Management Act – The federal consistency provision of the Coastal Zone Management ACt (CZMA, 16 U.S.C. 1451) requires federal actions (inside or outside a state's coastal zone) that affect

any land or water use or natural resource of a state's coastal zone, to be consistent with the enforceable policies of the state coastal management program (CMP).

This action falls within subpart F of the federal consistency regulations, covering activities funded by a federal agency. Based on the analysis of project activities and the employment of BMPs, NCCOS determines that this action will not have reasonably foreseeable effects on coastal uses or resources. In addition, the proposed activities are not on the Federal Consistency list for Texas, so no negative determination is required and no further action is required by NCCOS.

Protective Measures and Best Management Practices – Project PIs will adhere to restrictions and conditions outlined in the permits from NMFS and in Section 9 and in relevant appendices. Permits for takes of protected species contain conditions requiring permit holders to coordinate their activities with the NMFS regional offices and other permit holders conducting research on the same species in the same areas, maintain close communication, and, to the extent possible, share data or samples to avoid unnecessary duplication of research and disturbance of animals. After remote biopsy samples are taken, project PIs will continue to monitor the dolphins until the wound has healed, and will report any accidental dorsal fin shots to the NMFS OPR.