



November 27, 2024

VIA CERTIFIED MAIL-RETURN RECEIPT REQUESTED

SeaWorld Parks & Entertainment, Inc.
SeaWorld San Diego
ATTN: Managing Agent
500 Sea World Drive
San Diego, California 92109

SeaWorld Parks & Entertainment, Inc.
CA Registered Corporate Agent
330 N Brand Blvd
Glendale, California 91203

Sea World LLC
Registered Agent
C T Corporation System
330 N Brand Blvd
Glendale, California 91203

Re: Clean Water Act Notice of Intent to Sue/60-Day Notice Letter

To the Above-Listed Recipients:

Please accept this letter on behalf of the Coastal Environmental Rights Foundation (“CERF”) and San Diego Coastkeeper (“Coastkeeper”) regarding SeaWorld Parks & Entertainment, Inc.’s and Sea World LLC’s (collectively “SeaWorld”) violations of the Clean Water Act (“CWA”), Order R9-2022-0002 General National Pollutant Discharge Elimination System (“NPDES”) Permit for Residual Firework Pollutant Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks (“2022 Fireworks Permit”), and the predecessor to the 2022 Permit, Order No. R9-2011-0022, NPDES Permit for Residual Firework Pollutant Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks (“2011 Fireworks Permit,” collectively the “Fireworks Permit”). This letter is also intended to provide notice of SeaWorld’s violations of Order No. R9-2018-0004, NPDES Permit and Waste Discharge Requirements (“WDR”) for SeaWorld LLC DBA SeaWorld San Diego Discharge to Mission Bay, San Diego County (“Waste Discharge Permit”) for the SeaWorld San Diego facility at 500 SeaWorld Drive, San Diego, CA 92109 (“SeaWorld Facility”). The purpose of this letter is to put SeaWorld on notice of its violations of its Fireworks Permit, Waste Discharge Permit, and the CWA, for which CERF and Coastkeeper intend to file suit. As explained below, SeaWorld continues to discharge pollutants into a water of the United States (“WOTUS”) in violation of its Fireworks Permit, Waste Discharge Permit, and the CWA.

Section 505(b) of the CWA requires that sixty (60) days prior to the initiation of a citizen’s civil lawsuit in Federal District Court under Section 505(a) of the Act, a citizen must give notice of the violations and the intent to sue to the violator, the Administrator of the U.S. Environmental Protection Agency, the Regional Administrator of the U.S. Environmental Protection Agency for the region in which the violations have occurred, the U.S. Attorney General, and the Chief Administrative Officer for the State in which the violations have occurred

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[33 U.S.C. § 1365(b)(1)(A)]. This notice letter (“Notice Letter”) is being sent to you as the Responsible Party for the unlawful discharges. This Notice Letter is issued pursuant to 33 U.S.C. §§ 1365(a) and (b) of the Clean Water Act as notice of CERF and Coastkeeper’s intention to file a federal enforcement action against SeaWorld for violations of the Clean Water Act sixty (60) days from the date of this Notice Letter.

1. Background

1.1 CERF and Coastkeeper

CERF is a non-profit public benefit corporation organized under the laws of the State of California with its main office in Encinitas, CA. CERF is dedicated to the preservation, protection, and defense of the environment, the wildlife, and the natural resources of the California Coast. CERF’s mailing address is 1140 S. Coast Highway 101, Encinitas, CA 92024, and telephone number is 760-942-8505.

San Diego Coastkeeper is a non-profit public benefit corporation organized under the laws of the State of California with its office at 8305 Vickers Street, Suite 209, San Diego, CA 92111. Its telephone number is 619-609-0860. Founded in 1995, San Diego Coastkeeper is dedicated to the preservation, protection, and defense of the environment, wildlife, and natural resources of San Diego County watersheds.

To further these goals, Coastkeeper and CERF actively seek federal and state agency implementation of the CWA, and, where necessary, directly initiate enforcement actions on behalf of themselves and their members.

CERF’s and Coastkeeper’s members live, work, recreate, and/or otherwise use and enjoy the areas in and around the waters into which SeaWorld discharges, including but not limited to, Mission Bay and the Pacific Ocean (collectively “Receiving Waters”). Members of CERF and Coastkeeper use the Receiving Waters to swim, boat, kayak, surf, bird watch, view wildlife, fish, hike, bike, walk, run, general aesthetic enjoyment, and/or for educational opportunities or developing educational tools. Additionally, members of CERF and Coastkeeper use the Receiving Waters to engage in scientific study through pollution and habitat monitoring and restoration activities. The discharges of pollutants from SeaWorld impair each of these uses. Discharges of pollutants from fireworks debris and aquarium waste are ongoing and continuous. Thus, the interests of CERF’s and Coastkeeper’s members have been, are being, and will continue to be adversely affected by the Responsible Party’s failure to comply with the CWA.

1.2 SeaWorld’s Permits

SeaWorld Parks & Entertainment, Inc. is the managing member of Sea World LLC. SeaWorld Parks & Entertainment, Inc. is listed as the Owner and Operator of the SeaWorld Facility in the California Integrated Water Quality System (“CIWQS”). Both entities are listed as Owners of the SeaWorld Fireworks Event Location in CIWQS.

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The SeaWorld Facility is an aquatic amusement park that houses various marine animals in exhibit pools and aquaria, located within Mission Bay Park at 500 Sea World Drive, San Diego, CA 92109. In addition to its aquatic exhibit attractions, SeaWorld offers evening entertainment, including fireworks displays over Mission Bay.

The CWA Section 301(a) broadly prohibits the discharge of any pollutant to waters of the United States, except in compliance with an NPDES permit. Fireworks residue discharged into surface waters constitutes discharge of a pollutant from a point source within the meaning of the CWA.¹ Therefore, coverage under an NPDES permit is required before residual pollutant discharges associated with the public display of fireworks can be lawfully discharged. Pursuant to the CWA, residual discharges from fireworks events at SeaWorld are regulated under the 2022 Fireworks Permit, and the predecessor 2011 Fireworks Permit.

SeaWorld also discharges storm water and treated aquarium wastewater, which is regulated under its Waste Discharge Permit. SeaWorld pumps seawater from Mission Bay through two intake structures, an East and West intake, for use in its mammal pools, aquariums, and other exhibits.² The intake streams are separate, and each contains its own treatment system and outfall. Seawater pumped from Mission Bay is filtered and treated with disinfectants such as chlorine, ozone, or ultraviolet (UV) light to produce suitable habitats in various mammal exhibits and fishtanks.³ Wastewater from the salt water aquarium chemical treatments is discharged to Mission Bay, while wastewater from the fresh water aquarium chemical treatments is discharged to the City of San Diego's sanitary sewer system.

According to the Waste Discharge Permit, SeaWorld's wastewater discharge into Mission Bay contains various pollutants associated with aquarium and animal maintenance.⁴ For instance, SeaWorld periodically uses copper sulfate mixed with acetic acid to control parasite infestations in seven aquariums. Other drugs and chemicals used in a bath treatment include Cipro (ciprofloxacin) and Dylox (Trichlorfon). Dylox is an organophosphate pesticide that is used to control parasites in aquariums, and Cipro is an antibacterial drug that is used at the SeaWorld Facility as needed for ill animals. As further discussed in Section 1.4, *infra*, the pollutants associated with aquarium waste contained in SeaWorld's discharge have the potential to cause significant impacts to Receiving Waters by exceeding applicable water quality standards. In fact, SeaWorld has routinely exceeded its effluent limitations since January 2020 for total coliform, total suspended solids ("TSS"), copper, and enterococci.⁵

The Waste Discharge Permit sets forth various discharge prohibitions and effluent limitations for SeaWorld's discharges from the East and West Outfall, as well as receiving water limitations. The Fireworks Permit enumerates requirements for SeaWorld's discharges of residual fireworks waste. SeaWorld routinely fails to comply with the Fireworks Permit's and Waste Discharge Permit's effluent limitations, receiving water limitations, and discharge prohibitions, among other terms, in violation of the CWA. These ongoing and continuous

¹ 2022 Fireworks Permit, Attachment F § 1.1

² Waste Discharge Permit, Attachment F § II.A.

³ *Id.*

⁴ *Id.*

⁵ *See* Exhibit 1. SeaWorld's waste discharge monitoring data exceedances.

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violations result in significant impacts to the biologically sensitive ecosystems within Mission Bay.

1.3 SeaWorld's Fireworks Displays over Mission Bay

Fireworks have been a significant feature of SeaWorld's evening entertainment since 1968.⁶ Since then, SeaWorld's neighbors, veterans, and conservationists have voiced concerns about the resulting noise, water quality, health, wildlife, mental health, and domestic animal impacts.⁷ For decades, SeaWorld launched nightly fireworks for three months straight between Memorial Day and Labor Day, with additional shows during significant non-summer holidays (such as the New Year's Eve) and special private events.

Under the current Sea World Master Plan, SeaWorld can operate up to 150 fireworks shows per year, divided between 6-minute shows (up to 129 per year), 12-minute shows (up to 15 per year) and 20-minute shows (up to 6 per year).⁸ Typical performances start around 9:50 PM, near the closing of the park, and use approximately 250 shells per show for the shortest shows and up to 1750 shells per show for the longest. Fireworks are most often launched from a barge anchored in Mission Bay near the south end of Fiesta Island Pacific Passage. According to the Master Plan, major shows are launched from Fiesta Island, due to the increased number of shells used.⁹ As discussed in Section 1.4, *infra*, once firework residue enters a water body, it can be transported to waters and shorelines outside the fallout area due to wind shear and tidal effects.

The evolution of SeaWorld's permitting scheme for fireworks displays has been largely shaped by citizen suit enforcement and threats of litigation, as well as a growing body of evidence on the effects of fireworks on climate, wildlife, and public health.¹⁰ In 2007, the California Water Quality Control Board, San Diego Region ("Regional Board") revised the individual NPDES permit for SeaWorld San Diego (Order No. R9-2005-0091) to incorporate requirements for the discharge of pollutants associated with the public display of fireworks to Mission Bay. This novel NPDES permit was the first in the nation regulating the discharge of fireworks under the CWA and was the result of longstanding involvement from environmental advocates, including a notice of unpermitted discharges (more than 150 displays a year) sent by San Diego Coastkeeper.

⁶ See generally, Sea World Master Plan Update (July 2002).

⁷ See *Mission Bay Park Committee Letter to City of San Diego and California Coastal Commission* (Sept. 17, 2024), available at <https://www.sandiego.gov/park-and-recreation/general-info/boards/mbpc> (The Mission Bay Parks Committee voted unanimously to draft a letter to city and state officials urging SeaWorld to modify or cancel fireworks altogether due to their impact on native Mission Bay wildlife); see also [*San Bird Alliance*] *letter to California Coastal Commission regarding threats to breeding seabirds in Mission Bay* (Aug. 7, 2024), available at https://www.sdcoastkeeper.org/wp-content/uploads/2024/08/2024-31-07_Recreational-Impacts-Mission-Bay_SDAS-and-Sign-Ons.pdf (San Diego Bird Alliance also called on the city and state to revoke SeaWorld's fireworks permit, arguing the pyrotechnics disrupt nesting sea birds, such as the endangered California Least Tern).

⁸ Sea World Master Plan Update (July 2002) § II.E.

⁹ *Id.*

¹⁰ National Geographic, *Fireworks are out, drones are in? Why a July 4th tradition is slowly evolving*, (Jun. 27, 2024), <https://www.nationalgeographic.com/science/article/fireworks-drones-swarm-danger-health-technology>.

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In 2011, SeaWorld enrolled in the 2011 Fireworks Permit. Under Order No. R9-2011-0022, SeaWorld was designated as a Category 1 Discharger required to conduct receiving water quality and sediment monitoring. Under the 2011 Fireworks Permit, SeaWorld conducted receiving water quality and sediment chemistry and toxicity monitoring annually, and benthic community monitoring once every three years. However, the 2022 Fireworks Permit removed the Discharger Categories based on an incorrect presumption that SeaWorld's fireworks launches were decreasing.¹¹ Though SeaWorld decreased the frequency of its fireworks displays during the pandemic, it quickly resumed more frequent shows thereafter.

SeaWorld had also briefly reduced the number of fireworks events from 2017 to 2020, replacing them with drone and laser shows.¹² Beginning in 2017, SeaWorld introduced nighttime "acrobatic laser shows" and "aerial displays." The California Coastal Commission conditioned its approval of such shows upon a reduction in fireworks events.¹³ For instance, under Coastal Development Permit ("CDP") No. 6-16-0989, in exchange for approval of its "Cirque Electrique," SeaWorld was limited to fourteen (14) fireworks displays between Memorial Day and Labor Day.¹⁴ In 2019, SeaWorld introduced another nighttime aerial display, "as a potential alternative to their existing fireworks performances." The pilot project included a five-minute nighttime aerial drone show that ran between February 4 to February 18, 2020, and was also conditioned to reduce the frequency of fireworks shows.¹⁵ SeaWorld's previous shift to drone technology, as well as the prevalence of drones among other dischargers, demonstrates the feasibility of the technology in not only curtailing SeaWorld's environmental, health, noise, wildlife, domestic animal, and emotional impacts, but to come further into compliance with discharge prohibitions and other provisions of its NPDES permits.

1.4 Impacts on Coastal Ecosystems

1.4.1 Fireworks

Public displays of fireworks are frequently conducted over or adjacent to surface water bodies throughout the San Diego Region, including but not limited to, the Receiving Waters. The Fireworks Permit acknowledges that pollutants released during SeaWorld's fireworks shows adversely impact Mission Bay and require continued water quality and sediment monitoring.¹⁶ As the 2022 Fireworks Permit states, "SeaWorld's fireworks events have occurred at the same location in Mission Bay and would be expected to represent the maximum firework pollutant loading conditions and cumulative effects on a surface water body in the San Diego Region."¹⁷ This is due to a combination of specific factors, such as "(1) the restricted circulation of waters

¹¹ 2022 Fireworks Permit, Attachment F § 7.4.2.

¹² See 2022 Fireworks Permit, Attachment F § 1.3.5. "SeaWorld performed seven (7) firework display events in 2017, twelve (12) events in 2018, seventeen (17) events in 2019, and one (1) event in 2020."

¹³ See Coastal Development Permit (CDP) No. 6-16-0989; CDP No. 6-19-0925.

¹⁴ See California Coastal Commission Staff Report for Application No. 6-19-0925 (Oct. 2019).

¹⁵ *Id.* at § III.3, "(i) no firework performances may occur on any night an aerial drone show is held. (ii) Each performance of the aerial drone show shall count as an equivalent performance of a firework show for purposes of tracking SeaWorld San Diego's annual firework quota, thus reducing the allowable fireworks shows for 2019 from 150 to 135."

¹⁶ *Id.*

¹⁷ 2022 Fireworks Permit, Attachment F § 1.3.5.1.

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within Mission Bay, (2) the shallow depth of the bay in the vicinity of the fireworks events, and (3) the high frequency of repeat fireworks events throughout the year at the same location.”¹⁸

Typical chemical constituents within fireworks include but are not limited to aluminum, antimony, barium, carbon, calcium, chlorine, cesium, copper, iron, potassium, lithium, magnesium, oxidizers including nitrates, chlorates and perchlorates, phosphorus, sodium, sulfur, strontium, titanium, magnesium, and zinc.¹⁹ SeaWorld’s sediment quality monitoring data indicates “an accumulation of pollutants over time within the fireworks fallout area when compared to the reference sites.”²⁰ CERF and Coastkeeper also sampled the sediment near the barge at 32°46'2.97"N, 117°13'8.99"W, and at a reference point at 32°46'46.07"N, 117°13'33.53"W. These samples further demonstrate a pattern of pollutant loading from fireworks discharges. In particular, the barge sample sediment concentrations of aluminum, antimony, calcium, copper, potassium, strontium, magnesium, and titanium were higher than those of the reference site sediment.²¹ For example, antimony was 794 percent higher near the barge and copper was 610 percent higher. In addition, debris from unexploded shells as well as paper, cardboard, wires, and fuses from exploded shells can also adversely impact the quality within Mission Bay.

These pollutants are known to have adverse impacts on surrounding coastal ecosystems, as well as the potential to cause exceedances of applicable water and sediment quality objectives. For instance, lead is particularly harmful to aquatic organisms, causing neurological damage and disrupting reproductive systems.²² Barium and strontium, used for their vibrant colors, can be toxic to both fish and invertebrates, potentially leading to population declines and altered community dynamics.²³

Aerial explosions from fireworks release fine particulate matter (PM_{2.5}) and gases like sulfur dioxide and nitrogen oxide. These pollutants are known to cause a wide range of adverse health effects in humans, including premature mortality, respiratory and cardiovascular diseases, adverse pregnancy outcomes, and neurological diseases. Airborne particulate matter is particularly dangerous because, when inhaled, it can enter the lungs and be transported to other tissues in the body. It also poses risks to wildlife, because as particles settle into the ocean, they can smother delicate ecosystems, reduce light penetration, and disrupt photosynthesis in vital habitats like seagrass beds.²⁴

Another main chemical constituent in firework discharges is perchlorate, an oxidizing agent in rocket fuels, explosives, and some fertilizers.²⁵ As it relates to human health, it is widely

¹⁸ *Id.*

¹⁹ 2022 Fireworks Permit, Attachment F § 1.1.

²⁰ 2022 Fireworks Permit, Attachment F § 1.3.5.2.

²¹ Exhibit 3, CERF and Coastkeeper’s sediment sampling results.

²² Sanders, T., et al, (2009), Neurotoxic effects and biomarkers of lead exposure: a review. *Reviews on environmental health*, 24(1), 15–45. <https://doi.org/10.1515/reveh.2009.24.1.15>.

²³ US EPA Ecological Toxicity Information, <https://archive.epa.gov/reg5sfun/ecology/web/html/toxprofiles.html#ba>.

²⁴ Mousavi, A., et al, (2021). Impact of 4th of July Fireworks on Spatiotemporal PM_{2.5} Concentrations in California Based on the Purple Air Sensor Network: Implications for Policy and Environmental Justice. *International journal of environmental research and public health*, 18(11), 5735, <https://doi.org/10.3390/ijerph18115735>.

²⁵ 2022 Fireworks Permit, Attachment F § 1.3.4.

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understood that perchlorate can severely interfere with iodide uptake into the thyroid gland.²⁶ When it contaminates water bodies, perchlorate can adversely affect fish development. Moreover, the debris left behind from fireworks—comprised of plastic shell casings, cardboard, and other materials—adds to the pollution burden. As stated in the 2022 Fireworks Permit, “combustion residue is produced in the form of smoke, airborne particulates, chemical pollutants, and debris including paper, cardboard, wires, and fuses.”²⁷ These remnants can entangle marine life, and the non-biodegradable components can persist in the environment for years, further threatening coastal ecosystems. The long-lasting effects of this pollution underscore the need for more sustainable alternatives.

1.4.2 *Aquarium Waste*

Wastewater from SeaWorld has the potential to contain a variety of pollutants attributable to feeds, (directly or indirectly through feces), residuals of drugs used for maintenance of animal health, and residuals of chemicals used for cleaning or for maintaining water quality conditions.²⁸ Such pollutants can contribute solids and nutrients to receiving waters, and chemical and drug residuals potentially increase toxicity of the discharges and the promotion of resistance to antibiotics.²⁹ In addition, storm water discharged from SeaWorld during rain events has the potential to contain pollutants, including pesticides used for landscape maintenance.³⁰

Discharges of these pollutants from SeaWorld result in adverse impacts to wildlife and public health. High levels of bacteria in coastal waters are a threat to individuals who may unknowingly recreate in these waters. Despite treatment, as explained below, SeaWorld’s effluent regularly exceeds Waste Discharge Permit effluent limitations, compounding any existing water quality issues. Specifically, SeaWorld has routinely exceeded its effluent limitations since January 2020 for total coliform, TSS, copper, and enterococci.³¹ These exceedances pose serious threats to public health and surrounding ecosystem. For instance, copper is a toxic pollutant under the California Toxics Rule (“CTR”). Additionally, TSS measures the amount of sediment being carried by the effluent. Sediment clogs aquatic animal’s gills, blocks sunlight from reaching plants, and damages shellfish.

Total coliform and enterococci are indicators of the presence of fecal material in water and, therefore, of the possible presence of disease-causing bacteria, viruses, and protozoa.³² Exceedances of enterococci in a water body can negatively affect the recreational and economic value of the aquatic resource. Overabundance of fecal bacteria in the water can cause beach closures, swimming and boating bans and closures of fishing and shellfishing areas.

²⁶ Srinivasan, A., & Viraraghavan, T. (2009). Perchlorate: health effects and technologies for its removal from water resources. *International journal of environmental research and public health*, 6(4), 1418–1442, <https://doi.org/10.3390/ijerph6041418>.

²⁷ 2022 Fireworks Permit, Attachment F § 1.1.

²⁸ Waste Discharge Permit, Attachment F § II.A.

²⁹ Yang, Q., et al, *Antibiotics: An overview on the environmental occurrence, toxicity, degradation, and removal methods* (2021), *Bioengineered*, 12(1), 7376–7416, <https://pmc.ncbi.nlm.nih.gov/articles/PMC8806427/>.

³⁰ See Order No. R9-2011-0032, as amended by Order No. R9-2013-0034 (“2011 Waste Permit”) at § II.B.

³¹ See Ex. 1.

³² US EPA, Indicators: Enterococci (last updated on May 20, 2024), <https://www.epa.gov/national-aquatic-resource-surveys/indicators-enterococci>.

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Additionally, the Waste Discharge Permit acknowledges the potential presence of “a variety of pollutants attributable to feeds” in its discharge. It is known that anthropogenic particles, such as microplastics, are abundant in both marine fish and agricultural byproducts that are utilized to make fish feed.³³ Finally, the Waste Discharge Permit cites the potential for “other chemicals used for cleaning and maintenance” to be present in SeaWorld’s discharge, but does not specify the types of constituents.

1.5 The Receiving Waters and Their Beneficial Uses

SeaWorld discharges waste to Mission Bay, which empties into the Pacific Ocean. Mission Bay, San Diego, California is the largest aquatic park (4,235 acres) in the United States, and since the 1920's, it has been subject to multiple phases of alteration including dredging and the creation of artificial shorelines and islands. There are currently only 40 acres of wetlands remaining in Mission Bay. Wetlands such as those in Mission Bay serve as natural filtration systems, effectively mitigating the impact of pollutants. They also act as carbon sinks, absorbing greenhouse gases and contributing to climate mitigation efforts. These habitats provide homes for a diverse array of species and serve as vital breeding grounds for both terrestrial and aquatic migratory species. Further, Mission Bay has become a breeding ground for endangered species such as the California Least Tern (“CLTE”), underscoring its significance in preserving biodiversity and the delicate balance of nature. In addition to the four protected nesting sites for CLTEs (Mariner’s Cove, FAA Island, Stony Point, and North Fiesta Island), West Ski Island is now an established seabird breeding colony for larids in Mission Bay since 2020.³⁴ As discussed *infra*, the residual effects from SeaWorld’s fireworks discharge present a significant threat to these species.

The Water Quality Control Plan for the San Diego Basin (“San Diego Basin Plan” or “Basin Plan”) identifies the Beneficial Uses of water bodies in the region. The Beneficial Uses for Mission Bay include Industrial Service Supply; Contact Water Recreation; Non-Contact Water Recreation; Commercial and Sport Fishing; Estuarine Habitat; Wildlife Habitat; Preservation of Rare, Threatened or Endangered Species; Marine Habitat; Migration of Aquatic Organisms; Spawning, Reproduction, and/or Early Development; and Shellfish Harvesting.³⁵ The Beneficial Uses for the Pacific Ocean include Industrial Service Supply; Navigation; Contact Water Recreation; Non-contact Water Recreation; Commercial and Sports Fishing; Preservation of Biological Habitats of Special Significance; Wildlife Habitat; Rare, Threatened, or Endangered Species; Marine Habitat; Aquaculture; Migration of Aquatic Organism; Spawning, Reproduction, and/or Early Development; and Shellfish Harvesting.³⁶

³³ Muhib, M. I., & Rahman, M. M. (2023). Microplastics contamination in fish feeds: Characterization and potential exposure risk assessment for cultivated fish of Bangladesh. *Heliyon*, 9(9), e19789, <https://doi.org/10.1016/j.heliyon.2023.e19789>.

³⁴ See [San Diego Bird Alliance] letter to California Coastal Commission regarding threats to breeding seabirds in Mission Bay (Aug. 7, 2024), available at https://www.sdcoastkeeper.org/wp-content/uploads/2024/08/2024-31-07_Recreational-Impacts-Mission-Bay_SDAS-and-Sign-Ons.pdf.

³⁵ Basin Plan Table 2-3.

³⁶ *Id.*

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According to the current 303(d) List of Impaired Water Bodies, Mission Bay is impaired for Mercury and PCBs (Polychlorinated biphenyls).³⁷ Additionally, the segment of Mission Bay near SeaWorld (Mission Bay at Quivira Basin) is impaired for Copper. The Pacific Ocean Shoreline, Scripps HA, at Belmont Park, Mission Beach (“Pacific Ocean Shoreline”) is impaired for trash. Coastkeeper receiving water monitoring data collected monthly in Mission Bay also indicates that Mission Bay is impaired for copper, phosphorus, total coliform, and enterococcus.³⁸ As discussed below, information available to CERF and Coastkeeper, including direct observations, indicates that SeaWorld’s continuous violations of its Fireworks Permit and Waste Discharge Permit causes and/or contributes to the Receiving Waters impairments.

Elevated pollutant levels and disturbances associated with SeaWorld’s waste and fireworks discharge harm the special aesthetic and recreational significance of the Receiving Waters, adversely impacting the public’s ability, as well as that of Coastkeeper’s and CERF’s members, to use and enjoy these unique waterbodies. Pollutants discharged from SeaWorld harm the health of the Receiving Waters, and thus the plant and animal life of the surrounding habitats. Damage to these natural habitats, and thus the flora and fauna within them, harms the ability of the public, including Coastkeeper’s and CERF’s members’ ability, to use and enjoy these unique recreational and scientific/research opportunities. SeaWorld’s discharges also negatively impact human health. Further, Coastkeeper’s and CERF’s members are less likely to recreate in and around waters known to be polluted with harmful metals, excessive nutrients, and other pollutants.

2. Violations of the Clean Water Act

The CWA prohibits the discharge of any pollutant into a water of the United States without a permit.³⁹ If granted a permit, the discharger must comply with all permit limitations and terms. Each and every violation of an NPDES permit is a violation of the CWA for which the permittee is liable, including liability for civil penalties.⁴⁰

SeaWorld has violated and continues to violate the Fireworks Permit by routinely discharging plastic, trash, wires, and other related debris into Mission Bay with complete disregard for the Fireworks Permit terms. SeaWorld has also failed and continues to fail to comply with its Waste Discharge Permit, by, among other things, discharging total coliform and TSS in excess of effluent limitations.

2.1 Violations of the Fireworks Permit

Within the Regional Board’s territory, any person who discharges fireworks over a water of the United States must enroll and comply with the terms of the Fireworks Permit.⁴¹ On May 11, 2011, pursuant to Order No. R9-2011-0022, the Regional Board adopted the Fireworks Permit. On June 1, 2022, pursuant to Order R9-2022-0002, the reissued 2022 Fireworks Permit

³⁷ California 2020-2022 Integrated Report, https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2020_2022_integrated_report.html.

³⁸ See Ex. 2.

³⁹ See 33 U.S.C. §§ 1311(a), 1342.

⁴⁰ 40 C.F.R. § 122.41(a).

⁴¹ See 33 U.S.C. §§ 1311(a), 1342.

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took effect. The 2022 Fireworks Permit includes terms that are as stringent or more stringent than the 2011 Fireworks Permit. Accordingly, SeaWorld is liable for violations of the 2011 Fireworks Permit and ongoing violations of the 2022 Fireworks Permit, and civil penalties and injunctive relief are available remedies.⁴² As detailed below, SeaWorld fails to comply with the Fireworks Permit’s (1) discharge prohibitions; (2) discharge specifications; (3) receiving water limitations; and (4) reporting requirements.

2.1.1 Violations of the Discharge Prohibitions

Fireworks dischargers must (1) refrain from discharging “residual firework pollutant waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in Water Code section 13050;” (2) prevent residual firework pollutant discharges that “cause, have a reasonable potential to cause, or contribute to exceedances of any water quality objective adopted by the State Water Board or San Diego Water Board;” and (3) comply with the discharge prohibitions within the Basin Plan.⁴³

“Pollution” is defined by Water Code section 13050 as “an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects . . . [t]he waters for beneficial uses.” “Waste” is defined as “any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.”⁴⁴ At the point of discharge, firework debris and residue become “waste” that is subject to regulation.

The Basin Plan designates beneficial uses for water bodies in the San Diego region and establishes water quality objectives and implementation plans to protect those beneficial uses. The Basin Plan objective relating to floating material is “waters shall not contain floating material, including solids. . . in concentrations which cause nuisance or adversely affect beneficial uses.”⁴⁵ The Basin prohibits discharges of waste to receiving waters unless the discharge complies with water quality objectives.⁴⁶ “Nuisance” means

- (1) injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property;
- (2) [a]ffects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal

⁴² See *Illinois v. Outboard Marine, Inc.*, 680 F.2d 473, 480-81 (7th Cir. 1982) (relief granted for violations of an expired permit); *Sierra Club v. Aluminum Co. of Am.*, 585 F. Supp. 842, 853-54 (N.D.N.Y. 1984) (holding that the Clean Water Act’s legislative intent and public policy favor allowing penalties for violations of an expired permit); *Pub. Interest Research Group of N.J. v. Carter-Wallace, Inc.*, 684 F. Supp. 115, 121-22 (D.N.J. 1988) (“[I]mitations of an expired permit, when those limitations have been transferred unchanged to the newly issued permit, may be viewed as currently in effect”).

⁴³ 2022 Fireworks Permit § 4; 2011 Fireworks Permit § IV.

⁴⁴ Cal. Water Code § 13050 (West).

⁴⁵ Basin Plan at 3-19.

⁴⁶ Basin Plan at 4-31.

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(3) [o]ccurs during, or as a result of, the treatment or disposal of wastes.⁴⁷

The California State Water Resources Control Board adopted the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (“Thermal Plan”) to set water quality standards for the temperature of discharges.⁴⁸ The Thermal Plan mandates that for Mission Bay “the maximum temperature of waste discharges shall not exceed the natural temperature of the receiving waters by more than 20°F.” Waste is defined as “[l]iquid, solid, or gaseous material.”⁴⁹

SeaWorld’s discharges of fireworks debris (1) pollute and contaminate the Receiving Waters in such a way that impacts the beneficial uses, (2) cause a nuisance in the Receiving Waters, and (3) exceed the Basin Plan water quality objective for floating materials and the Thermal Plan water quality objectives for temperature.

SeaWorld’s fireworks discharges leave hazardous debris scattered across the Mission Bay seafloor, the nearby Fiesta Island and Pacific Ocean Shorelines, and beach areas. This debris—sharp wires, broken igniters, and shattered plastic—threatens beachgoers, disrupting their enjoyment and exposing them to physical hazards and toxic residues, including heavy metals (*see* Figures 1-3 below). Beyond physical risk, this pollution detracts from the natural beauty and tranquility of the area. SeaWorld’s release of thousands of pounds of waste⁵⁰ disturb the peace, safety, and comfort of these waters, creating an ongoing nuisance in violation of Discharge Prohibition 4.1.

As discussed in Section 1.5, *supra*, Mission Bay and the Pacific Ocean support beneficial uses, including contact and non-contact water recreation, as well as critical habitats for wildlife, including threatened and migratory species. SeaWorld’s ongoing deposition of hundreds of pounds of contaminated fireworks debris harms wildlife in Mission Bay and the Pacific Ocean, including water quality, ecosystem health, food webs, biodiversity, and public health.⁵¹ These depositions unreasonably affect recreational and wildlife beneficial uses through contamination. SeaWorld’s ongoing fireworks displays discharge contaminated waste that pollutes and degrades the ecosystem in violation of Discharge Prohibition Section 4.1.

⁴⁷ Cal. Water Code § 13050 (West).

⁴⁸ *See* 2022 Fireworks Permit § 6.1.2.

⁴⁹ Thermal Plan, pg. 1, 4-5.

⁵⁰ SeaWorld discharges around 200 pounds of fireworks debris at each show and recovers negligible fractions of that debris. Indeed, “SeaWorld’s typical fireworks display events consist of approximately 200 to 300 fireworks ignited with an estimated net explosive weight of approximately 170 pounds.” 2022 Fireworks Permit, Attachment F § 1.3.5.3.

⁵¹ Notice Letter Section 1.4.1, *supra*, describes in detail the toxic constituents and negative impacts on ecosystems.

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Image 1: Taken by a CERF representative on October 6, 2024. Shows a wire found stripped of its protective layer on the seafloor near the barge.

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Image 2: Taken by a CERF representative on October 24, 2024. Shows heaps of wires found on the seafloor near the barge that have been stripped of the protective covering and exposed.

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Image 3: Taken by a CERF representative on September 3, 2024. Shows non-biodegradable, broken, cross lift components with wiring attached on the shore of Fiesta Island.

The fireworks debris discharges violate numerous Basin Plan discharge prohibitions and water quality objectives, including those for floating materials. Fireworks debris is a floating solid, as evident by the surface water collection efforts required by the Fireworks Permit. As

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explained, this debris causes a nuisance in the Receiving Waters and adversely affects the beneficial uses. Indeed, the Pacific Ocean shoreline is impaired for trash and part of Mission Bay is impaired for copper, a common firework constituent. This deposition of trash, laden with copper, certainly causes or contributes to the Receiving Waters' impairments. SeaWorld has discharged and continues to discharge debris that causes or contributes to exceedances of the Pacific Ocean shoreline's trash impairments and Mission Bay's copper impairment in violation of Discharge Prohibition Sections 4.2 and 4.6.

The Thermal Plan prohibits discharges into Mission Bay that exceed the ambient water temperature by 20°F. SeaWorld's fireworks routinely violate this standard, with dangerously hot debris entering the bay at hundreds of degrees Fahrenheit.⁵² This occurs when (1) malfunctioning fireworks fall into the water before completing combustion and (2) hot particulates from the lift mechanism are released after ignition (*see* Figures 4 and 5).⁵³ Fireworks are solid waste as defined by the Thermal Plan, that SeaWorld routinely discharges into Mission Bay. During the shows, burning material can be seen depositing into Mission Bay (*see* Figures 4 and 5). Additionally, as discussed in Section 2.1.2, *infra*, SeaWorld fails to secure the wires and ignitors to the barge and these also discharge into Mission Bay while burning. SeaWorld discharges waste that exceeds Mission Bay's ambient water temperature by 20°F in violation of the Thermal Plan and Discharge Prohibition 4.2.



Images 4 & 5: Taken by a CERF representative on September 2, 2024 at the SeaWorld show. Displays burning debris entering Mission Bay.

⁵² For example, sparklers burn at 1200 degrees Fahrenheit. <https://www.wsav.com/news/are-sparklers-safe-for-kids-heres-how-hot-they-burn/>.

⁵³ Per SeaWorld's June 2024 self-monitoring reports, SeaWorld reported nine fireworks malfunctioned in various forms, including after detonation.

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These violations are continuous and ongoing. Every time SeaWorld discharges in violation of a Discharge Prohibition is a separate and distinct violation of the Fireworks Permit and CWA. SeaWorld has been in violation since at least January 1, 2020. CERF and Coastkeeper will update the dates of violations when additional information and data become available.

2.1.2 Violations of the Discharge Specifications

To control the level of pollution entering a waterbody, NPDES permits “commonly contain numerical effluent limits on the amounts of specified pollutants that may be discharged.”⁵⁴ However, an NPDES permit can “use [] other requirements such as BMPs in lieu of numerical effluent limits if the latter are infeasible.”⁵⁵

The Regional Board deemed effluent limitations infeasible for the Fireworks Permit and instead requires a discharger to submit a Fireworks Best Management Practices Plan (“FBMPP”).⁵⁶ A failure to comply with the discharger’s FBMPP is a failure to comply with the Discharge Specifications of the Fireworks Permit and to implement technology-based and water quality-based requirements of the CWA.⁵⁷ Indeed, compliance with the FBMPP is intended to control and abate the discharges to surface waters, protect water and sediment quality, and demonstrate compliance with the Fireworks Permit.⁵⁸ As relevant here, the FBMPP, at a minimum must:

- [1] consider the use of alternative fireworks produced with new pyrotechnic formulas that replace perchlorate with other oxidizers and propellants that burn cleaner, produce less smoke, and reduce pollutant loading to surface waters;
- [2] remove all plastic and aluminum labels and wrappings from aerial shells and special effect pyrotechnic devices prior to use and before they are launched or detonated;
- [3] select fireworks that do not contain plastic outer casings or have non-biodegradable inner components that make up more than five percent of the mass of the shell/device;⁵⁹
- [4] design the firing range and evaluate alternative firing ranges, to eliminate or reduce residual firework pollutant discharges to waters of the United States;
- [5] collect, remove, and manage particulate matter and debris from ignited and un-ignited pyrotechnic material including aerial shells, stars (small pellets of composition that produce color pyrotechnic effects), paper, cardboard, wires, and fuses found during inspection of the entire firing range and adjacent affected surface water(s);
- [6] If the fireworks are launched or ignited on barges or floating platforms . . . electric igniter wires used to trigger the fireworks shall be secured to minimize the risk that the wires would fall into the water during or after the discharge. As soon as practicable, and

⁵⁴ 2022 Fireworks Permit, Attachment F § 1.2

⁵⁵ *Id.*

⁵⁶ *Id.*, Attachment F § 4.2.3.

⁵⁷ *Id.* § 5.2.1; Attachment F, § 4.2.3 (“The primary mechanism for regulating such discharges are through the development and implementation of a FBMPP, as required by section 5.2.1 of this Order. The BMPs required herein constitute best available technology economically achievable and best conventional pollutant control technology”); see also, 2022 Fireworks Permit, §8.

⁵⁸ 2022 Fireworks Permit § 8; 2011 Fireworks Permit § VIII.

⁵⁹ A pyrotechnic expert, Dr. John R. Steinberg recently concluded using fireworks that do not contain plastic components is readily achievable. See, Exhibit 5.

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no later than 24 hours following a display of fireworks, the decks of each barge or floating platform that contained fireworks shall be raked or swept to collect fireworks debris and prevent it from being deposited into the water.⁶⁰

If a discharger's FBMPP fails to meet these minimum requirements, the discharger is in violation of the Fireworks Permit.⁶¹ Further, if the FBMPP fails to meet the Permit's minimum BMP requirements, or fails entirely to include an enumerated element, the discharger must still comply with the minimum BMP standards outlined in the Fireworks Permit.⁶²

SeaWorld submitted its most recent application to enroll under the Fireworks Permit in April 2023, which included its current FBMPP ("2023 FBMPP"). As relevant to the Notice Letter, the 2023 FBMPP imposes the following requirements:

[1] None of our devices use plastic shell casings. All our devices are manufactured using paper and cardboard. All identifying marks and labels are made of paper, not aluminum. All Fireworks Americas devices are 100% biodegradable;⁶³

[2] No later than 12 hours following the fireworks event . . . all plastic, cardboard, aluminum foil, fuses, wires and other debris resulting from the firework event on the barge or floating platform shall be collected and bagged. The deck of the barge or floating platform should then be raked or swept to remove any residual debris to prevent it from entering the water;⁶⁴

[3] As soon as practical, and no later than 12 hours following the fireworks event . . . A motorized boat, with a skimming device and net (maximum 1-1/2 inch mesh size), shall travers[e] the fallout area and collect any floating debris or dud shells which resulted from the fireworks event;⁶⁵

[4] Dive the water surrounding the fireworks launching barge at a radius of 50 feet, once a year to collect debris that has settled in Mission Bay. If needed the dive will continue for consecutive days to search the required area. When the entire area has been searched, the collected debris will be weighted and disposed of properly;⁶⁶

[5] For five (5) days following the fireworks display the fallout area on Fiesta Island will be walked once a day; times are dependent on tidal conditions. All walks shall be during daylight hours and times of lower tide.⁶⁷

SeaWorld's 2023 FBMPP went into effect in May 2023. Previously, SeaWorld operated under its FBMPP submitted in 2011 ("2011 FBMPP"). The 2011 FBMPP also contained the above listed 2023 FBMPP requirements except the FBMPP did not mandate (1) plastic-free fireworks, (2) a minimum of five days of shoreline debris removal, and (3) a dive team to

⁶⁰ 2022 Fireworks Permit § 5.

⁶¹ See 2022 Fireworks Permit, §8 and Attachment F §§ 4.2.3, 4.7.

⁶² See *id.*

⁶³ 2023 FBMPP, Attachment D, pg. 4.

⁶⁴ 2023 FBMPP, Attachment D, pg. 8.

⁶⁵ 2023 FBMPP, Attachment D, pg. 8.

⁶⁶ 2023 FBMPP § 3.a.v.

⁶⁷ 2023 FBMPP § 3.b.

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remove debris around the barge.⁶⁸ The 2011 Fireworks Permit also did not impose these actions.⁶⁹

As discussed in more detail below, SeaWorld has failed and continues to fail to prepare and implement a FBMPP that complies with the Permit, and to comply with its applicable FBMPP since at least January 1, 2020. Contrary to its own 2023 FBMPP, SeaWorld has (1) utilized and continues to utilize fireworks with non-biodegradable, plastic components; and (2) failed and continues to fail to (a) remove fireworks debris from Mission Bay's surface waters, (b) properly secure wires, igniters, and associated fireworks parts to prevent discharges into Mission Bay, (c) send a dive team to collect underwater debris, and (d) walk Fiesta Island for five consecutive days to collect debris. Under the 2011 FBMPP, SeaWorld failed to ensure adequate debris removal from Mission Bay and to properly secure the fireworks wires, igniters, and other materials to the barge to prevent discharges. Additionally, the FBMPP itself fails to "identify the personnel to be trained, their responsibilities, and the type of training they are to receive" in violation of the Permit.⁷⁰

Most notably, SeaWorld self-reported 2023 FBMPP violations. For example, SeaWorld failed to collect surface debris from Mission Bay by boat within 12 hours of a show. SeaWorld held fireworks events from June 24, 2024 to June 27, 2024, discharging hundreds of pounds of debris into Mission Bay. However, SeaWorld did not attempt to recover any of this toxic trash until June 28, 2024.⁷¹ In doing so, SeaWorld violated 2023 FBMPP Section 3.a.ii and 2022 Fireworks Permit Section 5.2.1.5.

Similarly, SeaWorld has failed and continues to fail to remove fireworks debris that washes ashore of Fiesta Island. For example, SeaWorld had fireworks shows over the 2024 Labor Day weekend. A CERF member walked the Fiesta Island shoreline between 4 PM and 5:30 PM on September 3, 2024 gathering fireworks debris. SeaWorld claims it sent its employee(s) between 2 PM and 6 PM to remove shoreline debris.⁷² Contrary to SeaWorld's report, the CERF member observed no one else collecting debris along the shoreline. This observation casts doubt on the accuracy of SeaWorld's reported collection efforts since at least January 1, 2020. Therefore, SeaWorld has violated and continues to violate 2023 FBMPP Section 3.b.i, 2011 FBMPP Section 2.2.2, and 2022 Fireworks Permit Section 5.2.1.5.

SeaWorld also violates Section 3.c.i of the 2023 FBMPP, which requires that the entire device be made of paper and cardboard, and that the operator must remove foil and plastic labels prior to detonation.⁷³ The debris recovered by CERF included foil pieces from the label and wrappings, and multiple nonbiodegradable components, including plastic caps for the shell's fuse caps (located within the shell), cross matches, and igniters, all of which were observed littering the seafloor and shoreline. The inclusion of these plastic components and failure to

⁶⁸ See generally 2011 FBMPP.

⁶⁹ 2011 Fireworks Permit § V.

⁷⁰ 2022 Fireworks Permit § 5.2.1.12.

⁷¹ June 2024 Cover Letter for SeaWorld's Monthly Report.

⁷² September 2024 Cover Letter for SeaWorld's Monthly Report, Table 1.

⁷³ See 2023 FBMPP, Attachment D, p. 4 ["None of our devices use plastic shell casings. All our devices are manufactured using paper and cardboard. All identifying marks and labels are made of paper, not aluminum. All Fireworks Americas devices are 100% biodegradable."]

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remove foil and plastic labels on the devices constitute violations of the 2023 FBMPP Section 3.c. and 2022 Fireworks Permit Section 5.2.1.3.

On October 6, 2024, CERF members conducted a dive beneath and around the fireworks barge to observe the condition of Mission Bay's seafloor. The dive team found numerous lengthy, spiky wires, foil, shattered plastic igniters, and cross matches with sharp ends littering the sensitive seagrass below the barge (*see* Figures 1 above and 5 below). In fact, the seafloor of the entire observed area near the barge was strewn with copious debris. The sheer amount of submerged fireworks waste indicates (1) SeaWorld has failed and continues to fail to send a dive team to collect settled debris⁷⁴ and (2) SeaWorld has failed and continues to fail to secure wires and other components to the barge specifically intended to prevent this type of discharge.⁷⁵ Thus, SeaWorld has violated and continues to violate 2023 FBMPP Section 3.c., 2022 Fireworks Permit Section 5.2.1.6, and 2011 Fireworks Permit Section V.4.



Image 5: Taken by a CERF representative on October 6, 2024. Shows wires grabbed from within seagrass near the barge.

The FBMPP itself also require the proper training to ensure all BMPs in the FBMPP are properly implemented. The Permit requires SeaWorld to “identify the personnel to be trained, their responsibilities, and the type of training they are to receive.”⁷⁶ The FBMPP acknowledges an entertainment department, environmental department, a dive team, a fireworks debris cleanup crew, and contracted fireworks operators. However, the FBMPP fails to identify any specific individuals responsible for the implementation of the BMPs set forth in the FBMPP, and, moreover, fails to identify any training these teams and/or individuals are to receive, in violation of the Permit.

⁷⁴ 2023 FBMPP § 3.a.v.

⁷⁵ 2023 FBMPP, Attachment D, pg. 6. “Operator shall ensure that all wires used to fire the display (including e-matches and “zip” wire) are secured to prevent wire debris from falling into surface water(s). This can be accomplished by tying e-match to each mortar tube through small hole at top.”

⁷⁶ 2022 Fireworks Permit § 5.2.1.12.

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In light of its numerous failures to comply with the Permit and its own FBMPP, SeaWorld has also failed and continues to fail to adequately conduct the required “visual observations to assess the effectiveness of the BMPs and update the FBMPP accordingly.”⁷⁷ The most obvious example of this is CERF’s observation of numerous plastic caps and foil pieces despite the FBMPP’s claims that all of the fireworks “are 100% biodegradable” and all “labels are made of paper, not aluminum.”⁷⁸

SeaWorld has operated with a deficient FBMPP, and failed and continues to fail to implement numerous provisions of its FBMPP since at least January 1, 2020. Every day SeaWorld operates with a deficient FBMPP is a separate and distinct violation of the Permit and CWA. Additionally, every time SeaWorld fails to implement its FBMPP is a separate and distinct violation of the Permit and CWA. CERF and Coastkeeper will update the dates of violations when additional information and data become available.

2.1.3 Violations of the Receiving Water Limitations

The Receiving Water Limitations (“RWLs”) of the Fireworks Permit prohibit discharges that cause or contribute to an exceedance of water quality standards in a Statewide Water Quality Control Plan, which includes plans like the Basin Plan and Thermal Plan.⁷⁹ The Basin Plan designates Beneficial Uses for the Receiving Waters.

As explained in Section 2.1.1, *supra*, SeaWorld’s fireworks discharges are causing a nuisance and adversely affecting the beneficial uses of Receiving Waters. As discussed in Section 2.1.2, *supra*, SeaWorld has failed to implement its FBMPPs to attempt to reduce fireworks discharges in any meaningful way. Fireworks debris deposits include plastic, cardboard, wires, caps, and other debris, as well as toxic metal residue like copper.⁸⁰

As explained *supra*, the Receiving Waters are impaired, and thus unable to support designated Beneficial Uses for some of the same pollutants discharged by SeaWorld. The Pacific Ocean Shoreline is impaired for trash. Part of Mission Bay is impaired for copper, and Coastkeeper’s Mission Bay monthly water quality monitoring data strongly indicates the entirety of Mission Bay is impaired for copper.⁸¹ SeaWorld discharges trash and copper substances into Mission Bay inland of Mission Bay’s copper impairments⁸² and the Pacific Ocean Shoreline, and thus causes and/or contributes to the trash impairments.

Similarly, SeaWorld’s discharge of burning waste into Mission Bay violates the Thermal Plan’s water quality objective of waste discharges being within 20°F of Mission Bay’s ambient temperature. As discussed in Section 2.1.2, *supra*, material on fire well exceeds this water quality objective.

⁷⁷ *Id.* §§ 5.2.1.12.

⁷⁸ 2023 FBMPP, Attachment D, pg. 6.

⁷⁹ 2022 Fireworks Permit § 6; 2011 Fireworks Permit § VI.

⁸⁰ 2022 Fireworks Permit § 3.2

⁸¹ Ex. 2.

⁸² *Cf.* Ex. 3 (excess copper buildup in sediment also suggests copper depositions in the water column).

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SeaWorld's ongoing failure to prevent trash and copper discharges that cause and/or contribute to the Pacific Ocean Shoreline's trash impairments and Mission Bay's copper impairments violates the Fireworks Permit's RWLs. Likewise, SeaWorld's routine discharges of blazing fireworks material into Mission Bay violate the Thermal Plan's water quality objective. SeaWorld violates the Thermal Plan each and every time it conducts a fireworks event from the barge in Mission Bay. Each time SeaWorld launches fireworks from its barge results in a discharge of pollutants in excess of RWLs and constitutes a separate and distinct violation of RWLs Section 6.1.1 of the 2022 Fireworks Permit, Section VI of the 2011 Fireworks Permit, and Section 301(a) of the Clean Water Act, 33 U.S.C. § 1311(a). SeaWorld has been in violation since at least January 1, 2020.

2.1.4 Violations of the Reporting Requirements

The Fireworks Permit requires SeaWorld to complete four types of monitoring reports, a Visual Monitoring Report ("Visual Report"), a Post-Event Report Form ("Event Form"), a Post-Fireworks Display Log ("Log"), and an Annual Report.⁸³ The Visual Report details the weather and receiving water conditions at the time of the event.⁸⁴ The Event Form contains information about the display and discharger, such as the name of the organization, the pyrotechnic operator, and the particulars of the display.⁸⁵ The Event Form requires the discharger to certify to the truthfulness of its contents.⁸⁶ The Logs contain information about each event, such as the date, start time, and duration of the event, the affected receiving water, and a certification that the FMBPP was fully implemented. The discharger submits the Visual Report, the Log, and the Event Form to CIWQS within thirty days following the end of the month of the event as a self-monitoring report, also called the monthly report.⁸⁷ The Log must be completed within ten days of an event and is also submitted with the Annual Report.⁸⁸ The Annual Report must be uploaded to CIWQS by August 30 of the year and include any permit violations, the Visual Report(s), Event Form(s), Log(s), list of all firework shows, and a certification to the accuracy of the information included.⁸⁹

SeaWorld has failed and continues to fail to upload its reports according to the Fireworks Permit specifications. For example, SeaWorld failed to upload the Log for its August 2, 2024 show in its monthly report. Similarly, SeaWorld completed its Logs for the July 1, 2024 to July 4, 2024 shows on July 15, 2024, past the allotted ten days. SeaWorld's reporting history reveals frequent disregard for deadlines and reporting. These missed deadlines and report omissions deprive the public of valuable information about Mission Bay.

Additionally, SeaWorld completes these forms haphazardly, omitting pertinent information, or uploading reports to the incorrect location. For example, the Event Forms omit the manufacturer of defective fireworks. For example, the June 8, 2024 Event Form admits that

⁸³ 2022 Fireworks Permit, Attachment E, § 9.

⁸⁴ *Id.* Attachment E, § 8.1.

⁸⁵ *Id.* Attachment E, § 9.2.

⁸⁶ *Id.*

⁸⁷ 2022 Fireworks Permit, Attachment C-1, C-2, C-3. See submission instructions.

⁸⁸ *Id.*

⁸⁹ The 2022 and 2011 Fireworks Permits also require dischargers to collect water and sediment monitoring. This data is submitted with the annual report.

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there was a defective shell that resulted in one 3-inch chain break. The Event Form requests that the shell's manufacturer be named; however, SeaWorld failed to list the manufacturer. These careless errors and omissions cast doubt on the accuracy of the information contained within the different types of monitoring reports.

SeaWorld routinely uploads reports to CIWQS attesting to compliance with the Fireworks Permit, the FBMPP, and to the accuracy of report contents. However, as discussed in Sections 2.1.1, 2.1.2, and 2.1.3, SeaWorld has failed and continues to fail to comply with Fireworks Permit, the FBMPP, and as discussed above, completes the reports haphazardly or unlawfully. Therefore, the information available to Coastkeeper and CERF indicates that these various certifications are erroneous. SeaWorld knew or should have known that it failed to comply with numerous procedural and substantive provisions of the Fireworks Permit, and thus certifications of these reports were erroneous.

Because SeaWorld has failed to comply with the Fireworks Permits' reporting requirements and falsified reports and certification, SeaWorld is in daily violation of the Fireworks Permit. Every day SeaWorld conducts operations at the SeaWorld without reporting as required is a separate and distinct violation of Section 301(a) of the Clean Water Act, 33 U.S.C. § 1311(a). SeaWorld has been in daily and continuous violation of the Fireworks Permits' reporting requirements every day since at least January 1, 2020. These violations are ongoing, and Coastkeeper and CERF will include additional violations when information becomes available.

2.1.5 Violations of the Discharge Prohibitions

The Fireworks Permit prohibits the discharge of residual firework pollutants to waters of the United States unless an NOI has been submitted and the San Diego Water Board "has provided the Discharger with an NOA identifying the discharge subject to WDRs. Discharge in a location or manner not prescribed in the issued NOA is prohibited."⁹⁰ In addition, "[t]he Discharger must submit a request for an amended NOA when a fireworks event is proposed at new location."⁹¹ Information available to CERF and Coastkeeper, including the SeaWorld Master Plan, suggests SeaWorld conducts fireworks and discharges from a location other than the fireworks barge. Specifically, SeaWorld's July 4th fireworks are launched from Fiesta Island, instead of the barge. However, the SeaWorld NOA reflects only one discharge location – the coordinates of the barge.⁹² Therefore, SeaWorld has violated the Fireworks Permit discharge prohibition and discharged pollutants without a valid NPDES Permit each and every time it has launched fireworks from a location other than its barge. On information and belief, each of SeaWorld's July 4th fireworks events has been launched from Fiesta Island, in violation of the CWA and the Permit's Discharge Prohibitions.

2.2 Violations of the Waste Discharge Permit

Pursuant to Order R9-2018-0004, SeaWorld, as the owner/operator, is liable for ongoing violations of its Waste Discharge Permit, and civil penalties and injunctive relief are available

⁹⁰ Permit, §4.4.

⁹¹ Permit, §2.3.

⁹² https://www.waterboards.ca.gov/sandiego/water_issues/programs/npdes/fireworks/docs/02_noa_seaworld.pdf

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remedies. Specifically, as detailed below, SeaWorld fails to comply with the Waste Discharge Permit's (1) effluent limitations; (2) RWLs; and (3) reporting requirements for the self-monitoring reports.

2.2.1 Violations of the Effluent Limitations

SeaWorld continuously discharges pollutants in concentrations that exceed its Waste Discharge Permit effluent limitations. Per Waste Discharge Permit Section IV.A, SeaWorld "shall maintain compliance" with the effluent limitations therein.⁹³ The effluent limitations include bacteria, metals, and toxicity, all of which can devastate and degrade the Receiving Waters.⁹⁴

As discussed in Section 1.4.2, *supra*, SeaWorld discharges treated aquarium waste, metals, pharmaceuticals, and pesticides into Mission Bay. As reflected in Exhibit 1, SeaWorld has routinely exceeded its effluent limitations since January 1, 2020 for the pollutants total coliform, TSS, copper, and enterococci. As a result, SeaWorld has been out of compliance with its Waste Discharge Permit for at least 500 days since January 1, 2020.

These violations are continuous and ongoing. Every time SeaWorld discharges in violation of an effluent limitation is a separate and distinct violation of the Waste Discharge Permit and CWA. SeaWorld has been in violation since at least January 1, 2020. CERF and Coastkeeper will update the dates of violations when additional information and data become available.

2.2.2 Violations of the Receiving Water Limitations

The Waste Discharge Permit contains RWLs based on applicable water quality standards in water quality control plans, like the Basin Plan.⁹⁵ The RWLs enumerate the bacterial characteristics that support Mission Bay's beneficial uses. SeaWorld's total coliform discharges cannot exceed median concentration of 70/100 mpn/100mL, and "230 mpn/mL for a five-tube decimal dilution test in more than 10 percent of samples collected."⁹⁶ For enterococcus, the concentration must not exceed 35 mpn/mL.⁹⁷

SeaWorld discharges total coliform and enterococcus in concentrations in excess of the RWLs.⁹⁸ For example, in June 2023, eighteen percent of samples exceeded the 230 mpn/mL for a five-tube decimal dilution test.⁹⁹ Coastkeeper's Mission Bay monthly water quality monitoring data shows routine exceedances for total coliform and enterococcus throughout Mission Bay, strongly indicating that Mission Bay is impaired for these pollutants. Thus, SeaWorld's

⁹³ Waste Discharge Permit § IV.A.

⁹⁴ *Id.*

⁹⁵ Waste Discharge Permit § V.A.

⁹⁶ Waste Discharge Permit § V.A.1.

⁹⁷ Waste Discharge Permit § V.A.1.

⁹⁸ Ex. 1.

⁹⁹ *Id.*

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discharges of excess bacteria degrades the Receiving Waters' beneficial uses¹⁰⁰ and is a violation of the Waste Discharge Permit's RWLs.

These violations are continuous and ongoing. Every time SeaWorld discharges in violation of a RWLs is a separate and distinct violation of the Waste Discharge Permit and CWA. SeaWorld has been in violation since at least January 1, 2020. CERF and Coastkeeper will update the dates of violations when additional information and data become available.

2.2.3 Violations of the Reporting Requirements

The Waste Discharge Permit requires SeaWorld to "report all instances of noncompliance" for the effluent limitations on the monthly self-monitoring reports.¹⁰¹ The report must detail "a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance."¹⁰² This information must also be provided in the cover letter submitted with the monthly self-monitoring report.¹⁰³

SeaWorld has neglected to document over 15 effluent violations in the specified violations tab on CIWQS as mandated by the Waste Discharge Permit.¹⁰⁴ As SeaWorld failed to identify these violations, it also failed to report the requisite information in the monthly report or cover letter. These omissions mislead the public by underrepresenting SeaWorld's violations. The requirement to promptly report violations is not only a legal mandate but a crucial aspect of public trust and accountability.

Every time SeaWorld fails to report as required is a separate and distinct violation of the Waste Discharge Permit and CWA. SeaWorld has been in violation since at least January 1, 2020. CERF and Coastkeeper will update the dates of violations when additional information and data become available.

3. Relief Sought for Violations of the CWA

In light of the SeaWorld's continuing, egregious CWA violations, CERF and Coastkeeper will seek injunctive relief preventing further violations pursuant to Sections 505(a) and (d), 33 U.S.C. § 1365(a) and (d), declaratory relief, civil penalties, and such other relief as permitted by law. Pursuant to Section 505(d) of the Clean Water Act, 33 U.S.C. § 1365(d), CERF and Coastkeeper will seek to recover their litigation costs, including attorneys' and experts' fees.

4. Conclusion

CERF and Coastkeeper are willing to discuss effective remedies for the violations described in this Notice Letter. However, upon expiration of the 60-day notice period, CERF and

¹⁰⁰ Notice Letter Section 1.4.2 discusses how bacteria degrade the Receiving Waters in detail.

¹⁰¹ Waste Discharge Permit, Attachment E, § VII.A.

¹⁰² Waste Discharge Permit, Attachment E, § VIII.B.7.

¹⁰³ Waste Discharge Permit, Attachment E, § VIII.B.7.

¹⁰⁴ See Exhibit 4, displays effluent violations missed by SeaWorld.

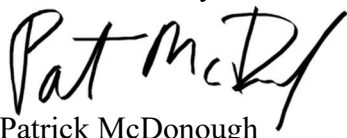
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Coastkeeper intend to file a citizen suit under Section 505(a) of the Clean Water Act for SeaWorld's violations of the CWA. CERF and Coastkeeper have retained legal counsel to represent them in this matter. Please direct all communications to CERF's and Coastkeeper's legal counsel:

San Diego Coastkeeper	Coastal Environmental Rights Foundation
Patrick McDonough patrick@sdcoastkeeper.org San Diego Coastkeeper 8305 Vickers Street, Suite 209 San Diego, CA 92111 Tel: 619-609-0860	Marco Gonzalez Livia Borak Beaudin Natalie Clagett livia@coastlawgroup.com Coast Law Group, LLP 1140 South Coast Highway 101 Encinitas, CA 92024 Tel: 760-942-8505

If you wish to pursue settlement discussions in the absence of litigation, please contact Coast Law Group LLP immediately.

Sincerely,



Patrick McDonough
Attorney for San Diego Coastkeeper



Marco Gonzalez
Livia Borak Beaudin
Natalie Clagett
Attorneys for Coastal Environmental
Rights Foundation

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SERVICE LIST

VIA U.S. MAIL

David Gibson Executive Officer San Diego Regional Water Quality Control Board 2375 Northside Drive, Suite 100 San Diego, California 92108	Michael S. Regan, Administrator Environmental Protection Agency Office of the Administrator 1101A 1200 Pennsylvania Ave N.W Washington, DC 20460
Martha Guzman Aceves Regional Administrator U.S. Environmental Protection Agency Region IX 75 Hawthorne Street San Francisco, California 94105	Eric Oppenheimer Executive Director State Water Resources Control Board P.O. Box 100 Sacramento, California 95812
SeaWorld Parks & Entertainment, Inc. G. Anthony Taylor Chief Legal Officer 6240 Sea Harbor Drive Orlando, Florida 32821	

Date	Outfall	Parameter	Result	Units	Calculation Type	Permit Limit	Days in Violation
April 9, 2024	1	TSS	16.0	mg/L	Average Monthly	Concentration shall not be increased by 10 mg/L from influent as an average monthly. Influent was 1.16 mg/L.	30
June 30, 2023	1	Total Coliform	18.0	%	percent of samples that exceed 230 mpn/mL	10% of samples not to exceed 230 mpn/mL in 5 tube decimal dilution test	30
March 2, 2023	1	Enterococci	113.0	mpn/100 mL	Average Monthly	35	31
March 2, 2023	2	Enterococci	119.8	mpn/100 mL	Average Monthly	35	31
February 1, 2023	1	Enterococci	86.3	mpn/100 mL	Average Monthly	35	28
January 10, 2023	2	TSS	39.2	mg/L	Average Monthly	Concentration shall not be increased by 10 mg/L from influent as an average monthly. Influent was 17.9 mg/L.	31
January 10, 2023	2	TSS	39.2	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was 17.9 mg/L.	1
December 1, 2022	2	TSS	65.8	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was non-detect.	1

Date	Outfall	Parameter	Result	Units	Calculation Type	Permit Limit	Days in Violation
December 1, 2022	2	TSS	51.5	mg/L	Average Monthly	Concentration shall not be increased by 10 mg/L from influent as an average monthly. Influent was non-detect.	31
March 2, 2022	2	TSS	21.0	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was non-detect.	1
March 2, 2022	2	TSS	19.8	mg/L	Average Monthly	Concentration shall not be increased by 10 mg/L from influent as an average monthly. Influent was non-detect.	31
February 15, 2022	2	TSS	15.0	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was non-detect.	1
February 15, 2022	2	TSS	15.0	mg/L	Average Monthly	Concentration shall not be increased by 10 mg/L from influent as an average monthly. Influent was non-detect.	28
January 11, 2022	1	TSS	15.5	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was non-detect.	1
January 11, 2022	2	TSS	15.5	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was non-detect.	1

Date	Outfall	Parameter	Result	Units	Calculation Type	Permit Limit	Days in Violation
December 17, 2021	1	TSS	68.2	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was 35 mg/L.	1
November 3, 2021	1	TSS	51.0	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was 33.9 mg/L.	1
September 2, 2021	2	TSS	56.0	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was 40.3 mg/L.	1
July 13, 2021	1	TSS	30.6	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was 3.3 mg/L.	1
July 13, 2021	1	TSS	30.6	mg/L	Average Monthly	Concentration shall not be increased by 10 mg/L from influent as an average monthly. Influent was 3.3 mg/l.	31
June 15, 2021	2	TSS	32.6	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was 1 mg/L.	1
June 15, 2021	2	TSS	32.6	mg/L	Average Monthly	Concentration shall not be increased by 10 mg/L from influent as an average monthly. Influent was 1 mg/l.	30
April 16, 2021	1	TSS	36.1	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was 4.8 mg/L.	1

Date	Outfall	Parameter	Result	Units	Calculation Type	Permit Limit	Days in Violation
April 16, 2021	1	TSS	36.1	mg/L	Average Monthly	Concentration shall not be increased by 10 mg/L from influent as an average monthly. Influent was 4.8 mg/l.	30
December 10, 2020	2	TSS	23.7	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was non-detect.	1
December 10, 2020	2	TSS	23.7	mg/L	Average Monthly	Concentration shall not be increased by 10 mg/L from influent as an average monthly. Influent was non-detect.	31
October 14, 2020	1	Copper	1.8	lb/day	Monthly	1	31
September 30, 2020	1	Total Coliform	18.0	%	percent of samples that exceed 230 mpn/mL	10% of samples not to exceed 230 mpn/mL in 5 tube decimal dilution test	30
September 30, 2020	2	Total Coliform	18.0	%	percent of samples that exceed 230 mpn/mL	10% of samples not to exceed 230 mpn/mL in 5 tube decimal dilution test	30
August 31, 2020	1	Total Coliform	18.2	%	percent of samples that exceed 230 mpn/mL	10% of samples not to exceed 230 mpn/mL in 5 tube decimal dilution test	31
August 31, 2020	2	Total Coliform	27.3	%	percent of samples that exceed 230 mpn/mL	10% of samples not to exceed 230 mpn/mL in 5 tube decimal dilution test	31
July 9, 2020	2	TSS	26.0	mg/L	Daily Maximum	Concentration shall not be increased by 15 mg/L from influent as a daily maximum. Influent was 1.3 mg/L.	1

Date	Outfall	Parameter	Result	Units	Calculation Type	Permit Limit	Days in Violation
January 31, 2020	1	Total Coliform	45.0	%	percent of samples that exceed 230 mpn/mL	10% of samples not to exceed 230 mpn/mL in 5 tube decimal dilution test	31
January 31, 2020	2	Total Coliform	18.0	%	percent of samples that exceed 230 mpn/mL	10% of samples not to exceed 230 mpn/mL in 5 tube decimal dilution test	31

Exhibit 2: Available via CEDEN

Constituent	Reference	Barge	Units	Percent Increase
Aluminum	4821.3	9840.5	ppm	104
Antimony	0.052	0.465	ppm	794
Calcium	727.6	901.8	ppm	24
Copper	0.393	2.79	ppm	610
Potassium	894.2	2321.6	ppm	160
Strontium	13.8	29.8	ppm	116
Titanium	404.4	563.1	ppm	39
Magnesium	3283.4	4412.3	ppm	34

Date	Missing Exceedance	Late Report
March 2,2022	TSS	
July 2023 Report		Submitted 19 days late
April 9, 2024	TSS	
March 1, 2023	Enterococci	
February 1, 2023	Enterococci	
January 10, 2023	TSS	
December 2, 2022	TSS	
February 15, 2022	TSS	
January 11, 2022	TSS	
December 17, 2021	TSS	
November 3, 2021	TSS	
September 2, 2021	TSS	
December 10, 2020	TSS	
October 14, 2020	Copper	
July 9, 2020	TSS	



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JOSEPH A. WALSH II
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December 1, 2022

L.A. Regional Water Quality Control Board
General Permitting Unit

VIA-EMAIL

Re: **Alternative Study Report**

This firm represents Naples Restaurant Group, LLC dba Boathouse on the Bay with respect to California Water Code § 13267 Investigative Order No. R4-2022-0213 issued on June 13, 2022.

This Alternative Study Report is submitted on behalf of and at the direction of the management of Boathouse on the Bay.

I, Joseph A. Walsh II, certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision, in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Very truly yours,

Joseph A. Walsh II

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3944 Carthage Road
Randallstown, Maryland 21133-4517
Consultant in Pyrotechnics and Energetic Materials
Expert Consulting and Forensic Services
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November 22, 2022

Caroline J. Wilson
Collier, Walsh, Nakazawa, LLP
One World Trade Center
Suite 2370
Long Beach, California 90831

Re: Response to Investigative Order/Alternative Fireworks Study

Dear Ms. Wilson:

I. Background

Qualifications:

I have twenty-eight years' experience in pyrotechnic chemistry, manufacture, and displays. I have served as an instructor in civilian and in law/fire enforcement training programs, have written numerous articles, a textbook on display operations, served as an author of National Fire Protection Association codes related to consumer and display fireworks manufacture and use and was asked to author the Chapter on Fireworks for the NFPA "*Fire and Life Safety Inspection Manual, 9th Edition*"; published by NFPA in 2011. Specifically, with respect to NFPA Codes, I have participated in drafting NFPA-1123, NFPA-1126, and other codes for twenty-one years and currently serve as a principal member of the NFPA Technical Committee on Pyrotechnics, a principal member of the NFPA Technical Committee on Hazardous Waste Disposal, and as an alternate member on the NFPA Technical Committee on Special Effects. I have participated in the writing of NFPA-1124-2003, 2006, 2013, 2017, and 2022 and NFPA-1123-2006, 2010,

2014, 2018, and 2022 as a principal member of the NFPA Technical Committee on Pyrotechnics. I have conducted numerous accident investigations, involving both consumer and display fireworks and have performed extensive testing of both consumer and display fireworks design and function. I am a full member of IABTI (The International Association of Bomb Technicians and Investigators) and maintain currency with literature in this field. I have qualified as an expert on pyrotechnics, explosives, and blast injuries in both state and federal jurisdictions. I have traveled to consumer and display fireworks manufacturing sites in the United States, Brazil, and Spain for the purpose of researching the methods utilized in fireworks manufacture. I serve on the Maryland Explosives Advisory Council of the Office of the Maryland State Fire Marshal/State Police and recently completed writing the current version of the licensing examinations for Maryland pyrotechnicians. In 2020, I was retained by the NFL as their lead pyrotechnics consultant. In 2021, I was asked by the Office of the Maryland State Fire Marshal to conduct a fireworks training for 98 fire marshals, bomb squad members, etc., from areas covering the entire state of Maryland. I maintain current licensure as a Special Effects/Proximate Pyrotechnics Operator and Operator of Outdoor Pyrotechnic Displays in the State of Maryland.

My 2022 pyrotechnics *curriculum vitae* is appended for further detail.

I have extensive experience conducting pyrotechnic/fireworks displays from floating platforms and barges in the Chesapeake Bay area and am conversant with marine environmental concerns as well as safe operating procedures.

Areas of Expertise and Issues/Subject Matter Addressed by Expert:

- Pyrotechnic chemistry, manufacture, and displays.
- Civilian and in law/fire enforcement training programs in pyrotechnics and explosives.
- Drafting and writing National Fire Protection Association codes related to consumer and display fireworks manufacture and use and hazardous waste disposal; use, applicability, and enforcement of said codes.
- Industry standards and application.
- Accident investigations, involving both consumer and display fireworks.
- Testing of both consumer and display fireworks and fireworks equipment design and function.
- Blast and burn injuries related to pyrotechnics and explosives.
- Interpreting medical records in fireworks and explosives injuries and fatalities.

- Pyrotechnic operator licensing and certification.

II. Responses to Investigative Order:

Using non-perchlorate fireworks:

I have extensive experience in the pyrotechnic industry as noted above. I attend the pyrotechnic industry trade association meetings. At the most recent annual conference of the American Pyrotechnics Association, I had the opportunity to engage in discussions with representatives of Chinese, Spanish, Italian, and Brazilian manufacturers of fireworks as well as with two US-based manufacturers of pyrotechnics. A google search for “non-perchlorate fireworks” was also conducted. While non-perchlorate oxidizers, such as nitroguanidine, have been studied in various pyrotechnic color formulas and in other applications such as road flares, they remain laboratory demonstrations as proof of concept at this point and are not commercially available. They emit less smoke and are non-perchlorate based, but, they are prohibitively expensive to manufacture and nitroguanidine is not available in the quantities, at a comparable expense, that potassium perchlorate is available. There simply are NO non-perchlorate fireworks commercially available to the US display industry at this time.

Using fireworks that do not contain plastic outer casings or have non-biodegradable inner components:

This goal is easily achieved as follows:

- Continue to use fireworks shells made entirely from biodegradable cardboard components.
- Continue to secure wires to the electrical firing slats and racks so that no plastic or metal debris leaves the barge firing platform.
- Use the retaining wall around three of the four sides to contain fuses and other debris to the surface of the barge.
- Test-fire the multi-tube devices before sending them out to the display site to assure that the inner components (inserts) are not made with plastic casings.
- Continue to request from manufacturers pyrotechnics that are made without plastic casings and components.
- As there are no particular advantages that accrue to using plastic components in pyrotechnics, from a cost or performance perspective, these can be eliminated as delineated above.

Using alternative propellants:

The propellant used to launch fireworks inserts and shells from tubes is black powder. It has explosive characteristics (low velocity blast wave, production of large quantities of gases for propulsion, relative lack of sensitivity to accidental ignition by friction/shock/electrostatic discharge, low expense, lack of toxicity) that have rendered it the only propellant used in commercial fireworks for virtually the entire history of this industry. Alternative propellants, such as smokeless powders and Pyrodex-type compositions, lack the type of explosive function to best propel muzzle loaded projectiles and thus are limited in their primary uses to breech-loaded projectiles (bullets in sealed cartridges used in guns). There are no commercially available fireworks that use propellants other than black powder. The second feature that makes black powder propellants desirable for use in fireworks is that the ingredients (potassium nitrate, charcoal, elemental sulfur) are non-toxic. The primary combustion products (potassium sulfate, water vapor, carbon dioxide) are also non-toxic. Alternative propellants are not a means to mitigate environmental impact from fireworks and are not commercially available.

Use of land-based fireworks discharge sites:

Land-based fireworks discharge sites represent a tradeoff of risks. Water-based displays offer certain safety advantages. In thirty years of experience in display fireworks, I have never observed or encountered an injury to the viewing audience or damage to land-based property as a result of a fireworks display discharged from a floating platform or barge. There is also an elimination of the risk encountered by persons encroaching upon the discharge site as marine police invariably maintain a safe perimeter.

The avoidance of plastic in fireworks and the use of walls around the display firing site as well as other techniques such as fastening down wires are effective in eliminating accidental loss of fireworks debris to the water surface. That stated, land-based displays offer a lower cost in that barge rental or donation is not required nor are support watercraft required.

Audience location may also be a factor in determining the ideal discharge site for a display with respect to both viewing opportunities and to public safety/traffic management issues, with greater control of traffic flow and traffic options available for water-based displays as no road closures or temporary fencing are required.

Submitted this date, November 22, 2022

By:

John R. Steinberg, MD