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F15b

5-24-0399 (Boys and Girls Club of Long Beach)

August 9, 2024

EXHIBITS

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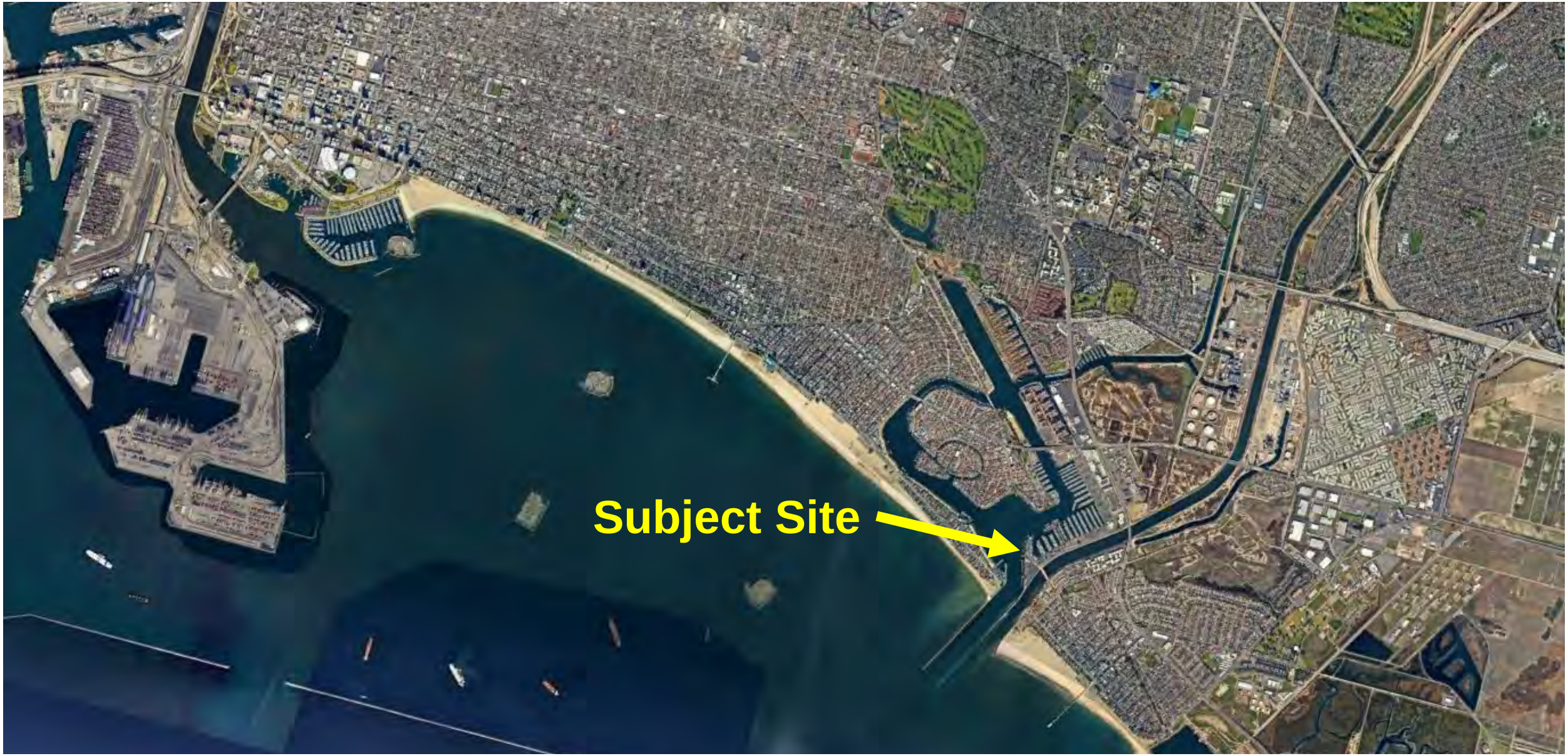
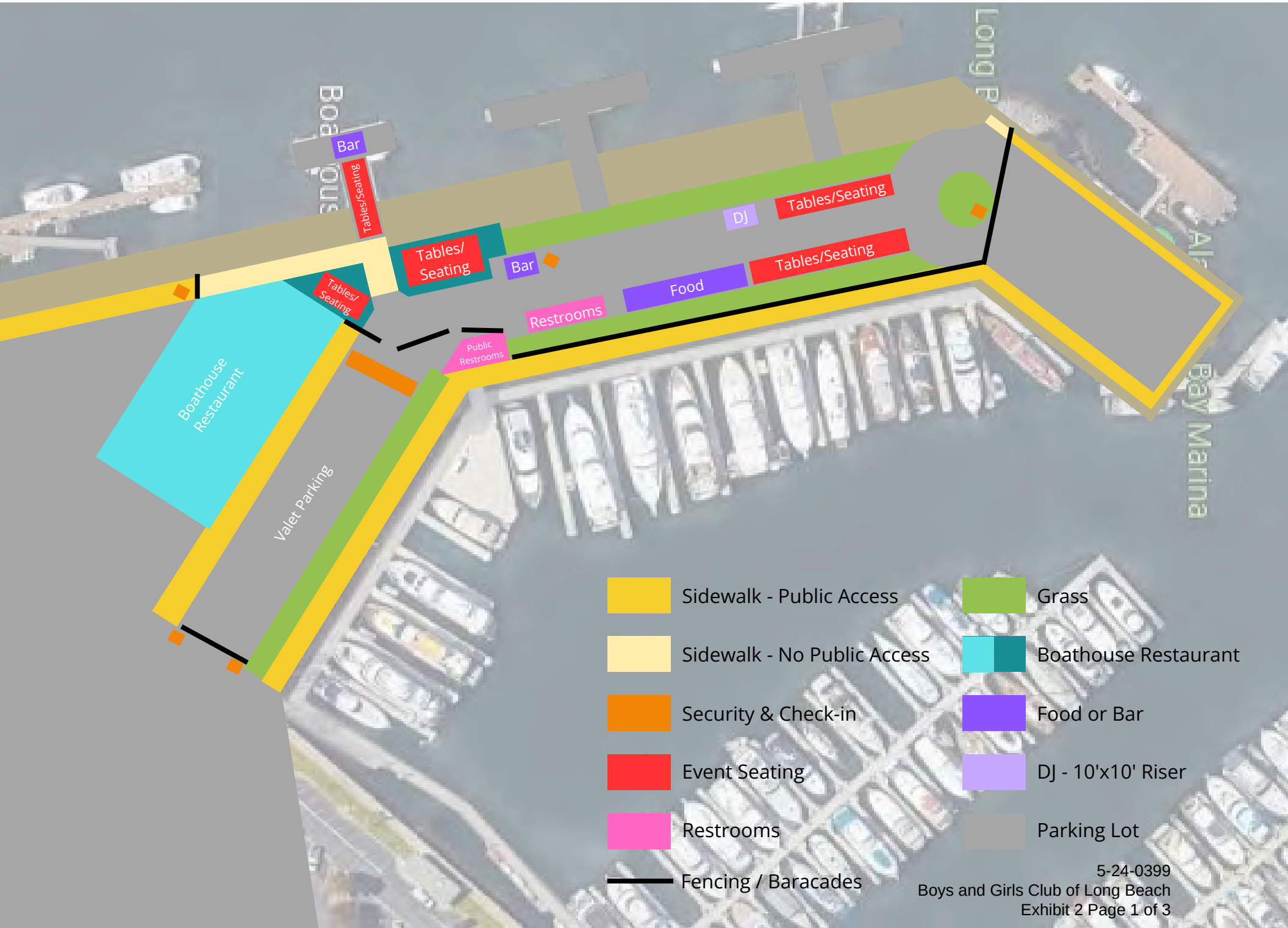



Naples Island
Alamitos Bay Landing
Fireworks Barge
Block Party
Long Beach Peninsula

EXHIBIT 2 – Event Staging Map and Schedule



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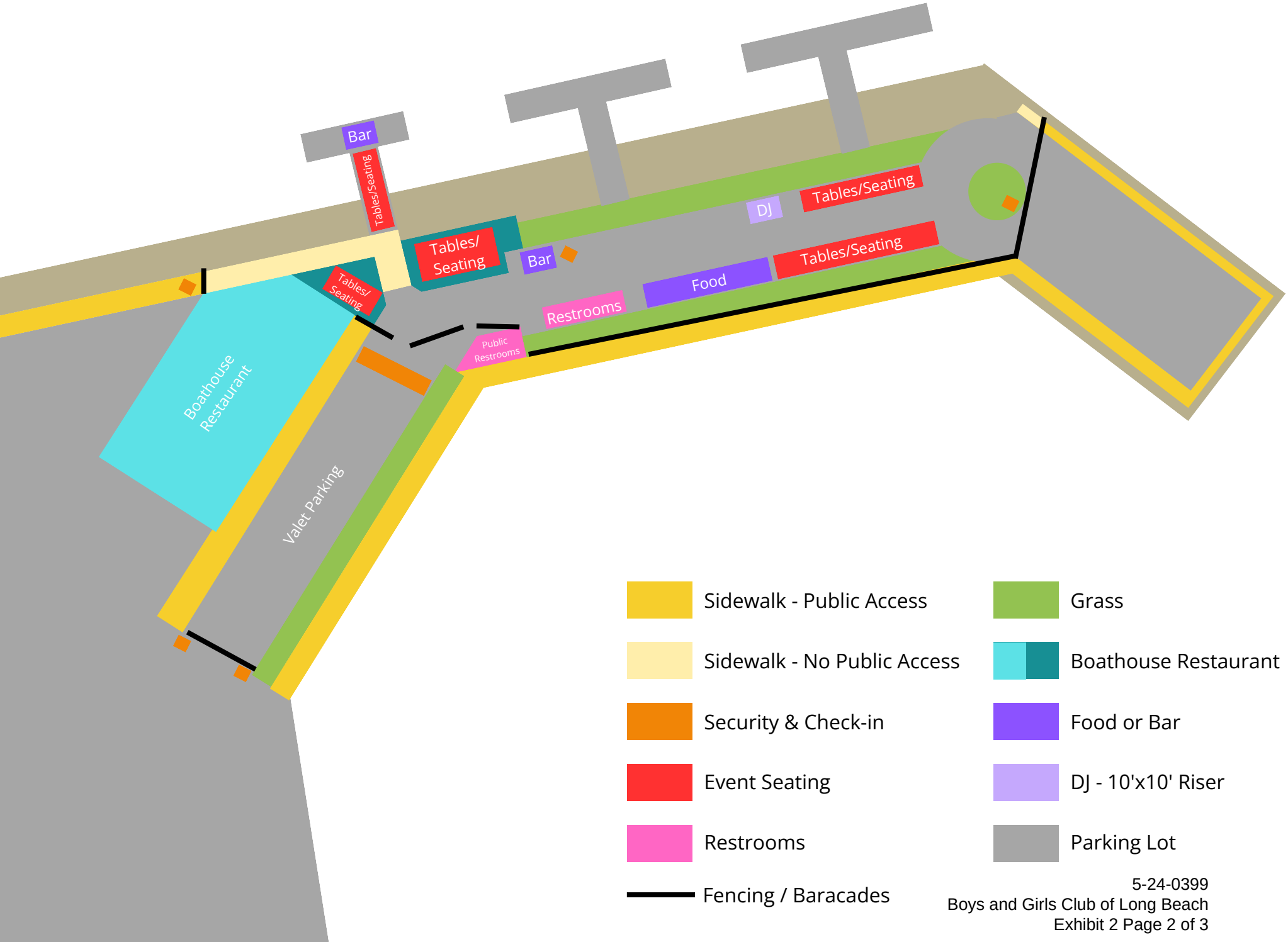

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BOYS & GIRLS CLUBS
OF LONG BEACH

Big Bang on the Bay
09/01/2024

Program Schedule

5:00 pm -	Guests check-in to receive wristbands
5:30 pm -	Boathouse on the Bay opens to guests
	One outside bar opens (closes at 8:45 pm
6:00 pm -	Event space opens to guests with wristbands
	Dinner is provided by Naples Rib Company
	Boathouse on the Bay restaurant is open to guests
6:50 pm -	Finish line for Big Bang on the Bay Sailing Regata
	Prayer and Thank you led by Bruce DD Macrae
7:00 pm -	American Flag Flyover
	National Anthem Sung
7:02 pm -	US Coast Guard MH-65 Dolphin Search and Rescue
7:05 pm -	Powered Para Gliders Entertainment
7:15 pm -	North American SNJ-5/AT-6 Duet featuring airshow performers
7:20 pm -	Open Cockpit 1943 Navy Stearman aerobatic
7:30 pm -	Tiger Squadron
7:45 pm -	Dancing in the Street with DJ
8:08 pm -	Sunset
8:58 pm -	2 minute countdown to fireworks show
9:00 pm -	Fireworks display
9:30 pm -	Event Closes

BIG BANG ON THE BAY

September 1st Fireworks Show

Fireworks Best Management Practices Plan
(FBMPP)

Firework's Best Management Practices Plan
Boys & Girls Clubs of Long Beach

Event Organizer/Oversight:

Boys & Girls Clubs of Long Beach
3635 Long Beach Blvd.
Long Beach, CA 90807

Pollution Prevention:

Product Selection: The Operator shall select and use fireworks that do not use plastic outer casings. The inner components of the fireworks will be made with biodegradable materials. Event Organizer notes that the quick match used in fireworks have a wax like coating, however, quick matches burn with the firework and remain on the barge. Event Organizer has been advised by a pyrotechnic expert and the Operator that fireworks that do not contain perchlorate or black powder are not commercially available at this time.[1] However, to the extent practicable and economically achievable, Event Organizer will consider the use of Alternative Fireworks or fireworks that use an alternative propellant, should either become commercially available. (BMP No. 1, 2, 3).

Firing Range Location and Design: To the extent practicable, the Firing Range will be selected and designed to minimize the risk of firework related debris falling into Surface Waters. Whenever practicable and feasible, mortars shall be angled vertically on the deck of the barge to minimize the debris fallout area. The Operator shall consider the readily available meteorological data on the day of the fireworks display and will delay and/or cancel the show if prevailing winds reach 25 knots. (BMP No. 4).

Pollutant Identification

Potential pollution may come from the firework itself. Fireworks sourced by the Operator do not use plastic components and are made up of biodegradable cardboard components. An extensive list of chemical constituents that may be used in a firework can be found in the American Pyrotechnics Association Standard 87-1. Specifically, however, Event Organizer is informed and believes that chemical compounds contained in fireworks may include, but are not limited to, potassium perchlorate, barium nitrate, strontium nitrate, aluminum, antimony, barium, carbon, calcium, chlorine, cesium, copper, iron, potassium, lithium, magnesium, phosphorous, sodium sulfur, strontium, titanium, and zinc. Other sources of pollution may come from the packing materials used to transport fireworks.

The Operator shall provide Event Organizer with the shipping manifest weight of the aerial shells and special effect pyrotechnic devices prior to use to determine the net explosive weight. At this time the Operator anticipates that 5 percent of the total weight of the fireworks-related waste will be created. (BMP No. 16).

Pollution Control Measures

The measures outlined below will be implemented where practicable and economically achievable to control, minimize and/or prevent pollution from entering Surface Waters.

[1] Event Organizers refer to an alternative study that was submitted to the water board on December 1, 2022 in response to Investigative Order No. R4-2022-0213

At all times, the Operator, will package, transport, set-up, and handle fireworks in accordance with California Code of Regulations, Title 19, Division 1, Chapter 6, Fireworks and Title 22, Chapter 33, Best Management Practices for Perchlorate Materials to prevent or minimize firework pollutant wastes from entering Surface Waters. (BMP No. 18).

At all times, the Operator, will setup, discharge, and take down the fireworks and fireworks equipment in accordance with the laws and regulations that apply to the Event. Event Organizer undertakes to contract with an Operator who is licensed by the State of California. The Event Organizer itself, or by and through the Operator, will ensure that all required permits, licenses and approvals from the authorities having jurisdiction over the Event will be obtained and the conditions and requirements of said permits and licenses will be adhered to. (BMP No. 17).

Containment Measures: The below Containment Measures will be employed to collect and control the mobility of fireworks debris, particulate matter, and waste from within the Firing Range.

- Event Organizer has confirmed that the Operator will use a barge that has pre-installed bin walls set up on three of the four sides of the barge. (BMP No. 8).

- Prior to setting up the fireworks display, the Operator will undertake efforts to ensure that the barge is "broom clean." Accordingly, the Operator will clear the barge of any debris and will inspect the barge for any safety concerns. Prior to and during set up, the Operator will inspect the barge for any potential safety concerns. (BMP No. 6)

- The Operator will take all possible measures, to the extent practicable, to ensure that wires and other pyrotechnic related equipment or product used during the Event are properly secured to and/or assembled on the deck of the barge to prevent wire or other pyrotechnic equipment from falling into Surface Waters. (BMP No. 5)

- The Operator will computer fire the display with electric matches. Electric match wires will be anchored to the mortars so that they cannot be pulled in to the air and risk becoming water borne debris. (BMP No.13)

- The Operator will angle all mortars vertically (to the extent practicable and without compromising the safety of the Operator, Crew Members, the barge, spectators or the general public) to reduce the size of the debris field.

- The Operator will follow California State Fireworks Regulations, Title 19 to ensure that all mortars and mortar racks are assembled and secured properly. Mortar racks will be secured to each other in groups. The mortar racks will be securely fastened and braced to each other with lumbar and nails such that each group becomes and remains stable and sturdy. (BMP No. 11)

- During set-up, the Operator will (to the extent practicable and without compromising safety protocol) continually undertake efforts to collect and secure extraneous debris (including

paper, packaging, plastic bags and cardboard boxes) to avoid the risk of debris falling into Surface Waters. (BMP No. 11).

- To the extent practicable, and without compromising the safety of the Operator, Crew Members, the barge, spectators or the general public, the Operator shall remove plastic coverings from aerial shells and special effect pyrotechnic devices. The Operator will only place aluminum wrappings on the grand finale where the protective barrier is deemed necessary by the Operator. Otherwise, aerial shells and special effect pyrotechnic devices will not be wrapped with aluminum. Event Organizer notes that it is illegal to remove labels from display shells regardless of whatever the labels are constructed of. (BMP No. 10).

Post Set-Up Procedures

The Operator will conduct a visual inspection of the barge and fireworks set up to ensure that the Containment Measures are satisfied before the Event. To the extent that non-conformities of the Containment Measures are observed, the Operator shall undertake, to the extent practicable, all efforts to rectify any non-conformities prior to the launch of the fireworks. (BMP No. 7).

Post Event Procedures

After the Event, and as soon as practicable without compromising safety protocols, the Operator will conduct a visual inspection of the barge to evaluate the effectiveness of the above Containment Measures and identify any safety concerns. Any observed non-conformities or safety concerns shall be immediately reported to the Event Organizer. (BMP No. 7, 9).

Immediately after a post-show safety assessment is conducted, the Operator will clean the deck of the barge and collect and remove all debris from ignited and un-ignited pyrotechnic material including aerial shells, stars, paper, cardboard, wires and fuses found on the barge. Duds, Misfires, or Unfired Shells shall be accounted for, retrieved, and removed in accordance with Title 19 of the California Code of Regulations, Section 1003. (BMP No. 12). The Operator will handle and manage hazardous fireworks waste in accordance with applicable fireworks and hazardous waste laws and regulations. (BMP No. 15). Non-hazardous solid waste that may result from the set-up, firing, and strike of the fireworks display will be collected and properly disposed of. (BMP No. 14).

Within 12 hours of the Event, Event Organizer will deploy a team of individuals to search for, collect, and dispose of any potential debris from ignited and unignited pyrotechnic material from the Event along adjacent shorelines to the extent that such debris exists on adjacent shorelines. (BMP No. 12, 14).

Event Organizers will retain an Environmental Team who will conduct a series of debris searches following the fireworks display throughout the possible debris field using a support vessel equipped with a 10hz Wide Area Augmentation system (WAAS) global position system (GPS), hull mounted scanning sonar, and a high resolution CHiRP single beam sonar which will provide

accurate depth and position information throughout the survey. The support vessel will also be equipped with high intensity floodlights for illumination of the waters around the support vessel. The Environmental Team will focus on search and collection of Fireworks Event related debris, if any, within Alamitos Bay. Fireworks Event related debris will be collected and weighed.

EXHIBIT 4 – Anticipated Fireworks Debris Fallout Zone

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EXHIBIT 5 – Event Alternative Analysis

Big Bang on the Bay

EVENT ALTERATIVE ANALYSIS

June 2024

Prepared for:

Boys & Girls Clubs of Long Beach
3635 Long Beach Blvd
Long Beach, CA 90807

For Submittal to:

California Coastal Commission
301 E Ocean Blvd,
Ste 300,
Long Beach, CA 90802

Prepared by:

Pi Environmental, LLC
426 Palm Road
San Marcos, CA 92069

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1.0 OVERVIEW

The Big Bang on the Bay (BBOB) Alternatives Analysis (AA) presented here has been prepared to evaluate a variety of environmental and non-environmental factors relating to the potential event options for the children charity fundraiser held annually in Alamitos, CA. The requested analysis has been prepared to identify a preferred event alternative based on the evaluation factors, and where possible, conform to the state policy of sustainability as defined by the California Environmental Quality Act (CEQA), which is to *create and maintain conditions under which man and nature can exist in productive harmony to fulfill the social and economic requirements of present and future generations*.

In general, the analysis of conceptual alternatives is a process used to assess potential projects and their potential for impact as part of a larger planning process (i.e., CEQA/NEPA). However, in the case of the BBOB, there is an existing history of regulatory review and environmental data for the event, which have been included in the AA evaluation where appropriate.

As the BBOB is principally a charity fundraising event, potential alternatives were also evaluated in the context of non-environmental factors like charitable contribution, local economic impact, and attendance in addition to environmental factors.

1.1 Event Alternatives

Event alternatives analyzed for the BBOB included the water-based fireworks event, which is the organizers preference, similar events that have are either already conducted in the LA region or have been suggested by the California Coastal Commission (CCC) to be performed as part of the BBOB. The conceptual event alternatives include a land-based fireworks event, a drone show, and a no-show alternative.

Land-based Fireworks Event

A conceptual land-based fireworks show would have many of the same general components as the existing water-based fireworks event, with one major exception, the launch area would be located near the shoreline in Alamitos. The conceptual example here assumes an area of appropriate size would need to securely roped-off to facilitate the land-based show for a variety of safety reasons. The available space needed for a land-based firework event in Alamitos is limited, therefore, the conceptual land-based event was evaluated with the assumption that the 7203 E. Ocean Blvd parking lot (or some other area) would be necessary used for staging the event (Figure 1). The land-based show assumes a proper safety distance for spectators of 100 meters (330-feet).

Water-based Fireworks Event

The water-based fireworks event is the preferred event type of choice for the charitable event. The fireworks are launched from the middle of Alamitos Bay using a walled barge (Figure 2). A safety zone for both operators and spectators is approximately 300-meters. The water-based firework event is currently permitted by the LARWQCB under Order No. R4-2023-0180, General NPDES No. CAG994007 for Discharges of Residual Firework Pollutants from Public Fireworks Displays to Surface Waters in Los Angeles and Ventura Counties (LARWQCB 2023).

Drone Event

A conceptual drone event alternative has been developed based on existing information on what would be needed to produce a drone show that is of the same visual character as a firework show. Available information from drone companies like Sky Elements, who performed the Redondo Beach show in 2023, estimate the number of drones per event to be in the several hundreds to over a thousand in number. Due to the need to support the ground crew, allow for proper geofencing, and provide a reasonable safety buffer, a larger launch and recovery platform than the types of floating barges used to support the event currently would be necessary.

However, more important to the AA, is that drone event operators, like Sky Elements, do not allow people to be under the show in the event of drone failure. In other areas of the country, the US Coast Guard is proposing to establish drone safety zones within navigable waters to protect personnel, vessels, and the marine environment from potential hazards created by aerial drone displays. This proposed rulemaking would prohibit persons and vessels from being in the safety zone unless authorized (DHS 2024). These types of necessary safety measures preclude an in-bay event and a drone event can only be held outside of Alamitos Bay (and over the ocean presumably). The conceptual drone event assumes the need to get a CDP and closing down the 7203 E. Ocean Blvd parking lot (or some other area) for launch and recovery operations , consistent with a land-based fireworks event (Figure 3).

No Event Alternative

The no event alternative assumes no event of any type.

1.2 Alternatives Initially Considered but Eliminated

Laser light shows were not included in the analysis. The proximity of a potential Alamitos Bay laser light show to the Long Beach Airport presents an insurmountable health and safety (H&S) concern removes this option from consideration. Lasers lights have been a known issue for pilots operating aircraft at night. A laser light show in Alamitos Bay could potentially extend laser light a long distance away from the event, and, depending on the type and intensity of the lasers used, impact aircraft around Long Beach Airport or that may be operating around the Port complex. Out of an abundance of caution, laser light shows were omitted from the analysis.

Figure 1. Conceptual Land-based Fireworks Event

Figure 2. Water-based Fireworks Event

Figure 3. Conceptual Drone Event

2.0 ALTERNTIVE EVALUATION FACTORS

To facilitate the evaluation of each event, environmental and non-environmental factors were reviewed and categorically assessed based on the potential of an event to have a related impact. These evaluation factors are a combination of the most recognizable environmental issues surrounding fireworks, and the socioeconomics surrounding the event. A description of each factor is provided in Table 1.

Table 1. Alternative Analysis Evaluation Factors

Evaluation Factor	Description
Environmental	
Water Quality[1]	Potential impacts associated with the magnitude and type of discharge to receiving waters from an event
Trash and Debris[1]	Potential impacts from trash and debris generated from an event
Avian Resources[2]	Potential for impacts to birds, nests, or chicks from an event
Sound Levels[3]	Potential for event derived sound levels
Air Quality	Potential impacts to air quality from an event
Non-Environmental	
Attendance	Potential for highest attendance
Charitable Contribution	Potential to generate the largest number of charitable contributions

1- Includes NPDES monitoring requirements and existing monitoring data in the evaluation and assessment of potential for impact

2- Evaluated includes existing data and assumes similar monitoring requirements in previous CDP

3- Evaluated for potential impacts to birds, nest, and chicks only.

Potential event alternatives were categorically assessed for environmental and non-environment factors. Each option was assessed individually based on the potential for impact. A summary of the scoring classifications for environment and non-environment factors are described in Table 2.

Using the score-based evaluation model, when scoring environmental factors, a score of 4 will represent the highest potential for environmental impact of the event types evaluated. For some evaluation areas, more than one factor may be used to assess the potential for impact. In these cases, the highest of the scores evaluated will be used for assessing the preferred alternative.

Non-environmental factors will receive a score of 4 for the greatest reduction, or least beneficial alternative. A score of 1 for non-environmental factors would suggest the highest event impact and represents the event with the most potential to raise the largest amount of money for underprivileged children, local economic impact, and engage the largest amount of people in the local community (i.e., attendance). Final score tabulations will sum the environmental and non-environmental factors, and based on the sum of the scores, the event type with the lowest score will be the preferred alternative.

Table 2. Evaluation Factor Scoring

Score	Description	
	Environmental Factors	Non-Environmental Factors
1	Low potential for environmental impact	Most Potential
2	Low to Medium potential for environmental impact	Medium to High Event Potential
3	Medium to high potential for environmental impact	Low to Medium Event Potential
4	High potential for environmental impact	Low Event Potential

2.1 Water Quality

Potential water quality impacts from the various alternatives are affected by the same physical force, gravity. For events over water, the receiving waters of the state act as a sink for any potential discharges coming from an event, regardless of type. Therefore, each event type has some level of potential discharge to the waters of the state.

Land Based Fireworks Event

A land-based firework event has a low to medium potential for fallout and a reduced potential for impacting the waters of the state versus water-based events due to the launch location being on land. This reduces the available receiving water area to a 180-degree semi-circle instead of a full 360 degrees around a barge. Therefore, the land-based show has slightly less potential for impact than a water-based firework event.

Water Based Fireworks Event

A water-based fireworks show, and potential for impacts to water quality, has already been assessed by the LA Regional Water Quality Control Board Order No. R4-2023-0180, General NPDES No. CAG994007 for Discharges of Residual Firework Pollutants from Public Fireworks Displays to Surface Waters in Los Angeles and Ventura Counties (LARWQCB 2023). Prior to issuing the fireworks general permit, the LA Board analyzed the potential for impact given the threat to water quality from pollutants associated with firework discharge. Based on the LARWQCB scientific review, ***'residual firework pollutants discharges pose no significant threat to water quality'*** *(Attachment A Fact sheet, LARWQCB 2023).*

As the LARWQCB is the lead agency responsible for managing and regulating the coastal waters in the LA region and has already made a determination on the potential for impacts to surface waters from fireworks, the evaluation of potential water quality impacts from firework event types incorporates the findings made previously by the LARWQCB in 2023.

Drone Event

The possibility of drone impact to water qualty is low, but it is not zero. In January of 2024, a drone show in London experienced a type of software or mechanical failure, and the drones fell into the water. A similar situation happened in Melbourne, AU in July of 2023, which resulted in over 350

drones ending up in the Yarra River (Guardian 2023). Drone shows can fail for a variety of technical and mechanical reasons, including faulty programming during event set-up, or something as simle as a malfunctioning battery.

Drones are usually powered by Lithium-ion batteries. The presence of hundreds of drones above the water in San Pedro Bay means that even a low rate of failure can lead to a drone (or dozens of drones) ending up in the ocean. The potential for unfound batteries leeching chemicals into San Pedro Bay represents a low to medium potential for impact to the receiving waters.

Table 3. Water Quality Potential for Impact

Event Type	Risk of Fallout	Pollutant Potential	Water Quality Score
Land-based Fireworks	2	1	2
Water-Based Fireworks	3	1	3
Drones	1	2	2
No Show	1	1	1

2.2 Trash and Debris

All of the event types evaluated (except for the no show alternative) have some potential for generating trash and debris that can end up in the local environment. In the case of fireworks events, it is primarily cardboard, the outer shell of the firework. However, unlike recreational fireworks, commercial grade pyrotechnics do not contain items like plastic nosecones and long cylindrical fuselages. Rather, debris found from commercial fireworks shells is a combination of layered cardboard, small wrappers, string, and occasionally wire wrap ties.

Land Based Fireworks Event

A land-based fireworks event would have a low to medium potential for adding trash and debris to the system. There is slightly less potential for impact than a water-based show due to the launch location being on shore, which would help post event clean-up activities to collect event derived debris, but not enough to assign a lower (less potential for impact).

Water Based Fireworks Event

As water-based shows are launched from a barge, there is a high initial potential for debris and trash to be deposited into the environment. However, as part of the mitigation required by the NPDES permit for fireworks in the LA Region, debris is collected, weighing, and described as part of the post event environmental compliance activities. Further, the LA board also requires a barge with sides (e.g., walls), which helps reduce potential debris introduction near the barge. As there are existing mitigating regulatory requirements for both fireworks event types specific to addressing trash and debris from the event, the overall potential for fireworks trash and debris is low to medium.

Drone Events

While drone events do not have debris or trash generated as part of the show, if a drone does end up in the ocean, removing them will be very difficult (if possible). It is one scenario for drones to fall into Alamitos Bay, where the use of acoustic tools like side scan sonar could help identify and recover them. However, if a drone (or hundreds of drones) were to fall into San Pedro Bay, there is very little chance that all of them will be recovered, given currents in the semi unprotected bay. Therefore, the trash and debris potential are low to medium for a drone event.

No Event Alternative

In the case of the no show alternative, there would be no event (firework or drone) and therefore no potential for trash and debris contribution to the local environment.

Table 4. Trash and Debris Potential for Impact

Event Type	Trash and Debris Potential
Land-based Fireworks	2
Water-based Fireworks	2
Drones	2
No Show	1

2.3 Avian Resources

All the event types evaluated (except for the no show alternative) have some potential to impact avian resources. In 2008, the CCC found that fireworks were causing birds to abandon their nests due to an event in Mendocino. However, ornithological experts from the Cornell Laboratory of Ornithology, said about potential impacts to birds from fireworks, 'that unlike in winter months, when some birds roost together in large groups, birds are more spread out in the summer. You're going to scare a few robins here and there, but that's not going to affect a large number of birds.' (Audubon 2013)

As part of the 2023 event, a series of avian surveys were performed pre and post fireworks. In the days leading up to the event, the pre event survey observed western gull (*Larus occidentalis*) chicks in a nest behind a channel marker sign near the fuel dock (Figure 1). The presence of the chicks was reported to the CCC as per requirements identified in the CDP. A post event survey of the same nest documented no change in the health or condition of the chicks.

Figure 4. Western Gull Chicks from the 2023 Event

Land Based Fireworks Event

Land-based fireworks events pose a potential for impacting avian resources due to proximity to trees where nesting birds may be found, and the lights and sounds associated with firework events.

However, for the purposes of assessing the potential for impact to avian resources, it is assumed that biological monitoring requirements stipulated in the 2023 CDP would be carried forward into any subsequent CDP, mitigating any potential disturbance. Given the empirical date from the site, which suggests a reduced level of disturbance, the categorical assessment for a land-based firework event has a low to medium potential for impact.

Water Based Fireworks Event

Water-based firework events have the same potential for impact to avian resource as a land-based event, but being in the middle of the Bay, are located further away from trees that may have nests or chicks. The distance between trees with nests and the launch area is an important mitigating factor and key difference between a land and water-based show. However, the distance is not far enough to represent a reduced overall potential for impacting avian resources. Therefore, accounting for monitoring and mitigation, a water-based fireworks event represents a low to medium potential for impact to avian resources in the Alamitos Bay.

Drone Event

A drone show represents a different kind of impact to birds and avian resources, direct interaction. Drones are known to cause injury to birds, but the behavioral effects have only recently been studied. The Golden Gate Bird Alliance (GGBA) states that if drones are flown too close to rookeries or bird nests, the noise and unfamiliar presence of a drone can disrupt nests, provoke attacks by raptors, interrupt feeding, and cause disorientation (GGBA 2023), many of the same issues that have been associated with fireworks.

Recently published meta-analysis in the Journal of Field Ornithology suggests that the potential for disturbance to avian resources is dependent on the altitude the drones are flown at, and the type of species present (Leija 2023). A drone sow at 400-ft may attract birds from further distances, which would make monitoring and any mitigation measures challenging. Given the uncertainties with respect to how birds along the coast would respond to a large-scale drone show and the potential for injury to birds, a drone event represents a medium to high potential for impact to avian resources.

No Event Alternative

A no event alternative would not have any direct or indirect impacts to avian resources in Alamitos Bay.

Table 5. Avian Resource Potential for Impact

Event Type	Avian Resources Impact Potential
Land-based Fireworks	2
Water-based Fireworks	2
Drones	3
No Show	1

2.4 Sound Levels

All of the events have sounds associated with them, either the percussive exploding sounds from fireworks that represent a temporary threshold shift (TTS) in the baseline sound levels, or the permanent threshold shift (PTS) of hundreds (or thousands) of drones while operating. Research conducted by the Boys Town National Research Hospital (BTNRH) suggests that fireworks can produce peak sound levels between 150-175 dB re: 20 µPa. For an adult, the BTNRH suggests at least 20 meters away and for kids, 50-60 meters away (BTNRH). In the case of drones, the sound levels created from the drones are much lower and can range between 70-85 dB (RSG 2021), which also attenuates with distance.

One concern with fireworks is the effect on those individuals suffering from Post Traumatic Stress Disorder (PTSD) and household pets. In general, a random firework exploding can have a startling effect, especially to those with PTSD or for pets. However, the BBOB is an advertised event and held at a very specific time annually, the 3rd of July at 9 pm. The local community knows well in advance when the first boom will happen, and it is possible for those with PTSD and others to make arrangements to mitigate the impacts from the fireworks well in advance of the BBOB event.

Land Based Fireworks

A land-based fireworks show will likely produce sounds in the 150-175 dB range at source. In order to maintain a sufficiently safe distance between guests and the fireworks, a sound level safety distance would need to be maintained, in the conceptual example provide in Figure 1, 100 meters was used to account for event safety and sound attenuation. Due to these factors, a land-based fireworks show would represent medium to high potential for sound level impacts.

Water Based Fireworks

A water-based fireworks event will have several percussive sound levels in the same range as a Land-based show and estimated by BTNRH to be in the 150-175 dB range. The mid-bay on water location is approximately 200-250 meters from the barge, which reduces the potential or impact to guests from being too close to the event and impacts to birds. A water-based fireworks show would represent low to medium potential for sound level impacts.

Drone Event

A drone event held over San Pedro Bay will likely produce very low levels of sound while the display is underway. The highest levels of sounds generated would be expected at the launch point, where a several hundred (or more) drones would be staged for lift-off. As suggested by the National Aeronautics and Space Administration (NASA) drones may not be loud, but research suggests they are less pleasing. Going from the noise of a car to the noise of a drone increased annoyance by the same degree as making the car sound twice as close (Grossman 2017). While drone sounds may be less pleasing than other sounds, they represent a low potential for sound level impacts.

No Event Alternative

A no event alternative would not have any direct or indirect impacts to sound levels in Alamitos Bay

Table 6. Sound Level Potential for Impact

Event Type	Sound Level Potential for Impact
Land-based Fireworks	3
Water-based Fireworks	2
Drones	1
No Show	1

2.5 Air Quality

Air quality can only be impacted by the two fireworks alternatives. Ignoring any potential greenhouse gas emissions from charging hundreds of drones, fireworks have been shown to reduce air quality, increase particulate matter concentration, and can release such chemicals as sulfur dioxide (SO_2), carbon dioxide (CO_2), carbon monoxide (CO), and particulate matter (PM) along with several metal salts, for example aluminum, manganese, and cadmium (Gouder, 2014).

Two mitigating factors include the Alamitos firework event is generally short in duration (less than 30 minutes), which constitutes approximately 0.003% of the available time in a year, and the smoke from the aerial fireworks display is rapidly dissipated by predominating winds (generally blowing onshore from west to east).

Land-Based Fireworks

A land-based firework show has a medium to high potential for impacts, and the highest relative potential for impacting air quality of any other events considered. This is largely due to the proximity of a land-based fireworks event to guests and wildlife.

Water-Based Fireworks

A water-based firework event represents a low to medium potential for impact to air quality. In part due to the same general mitigating factors of the show itself extremely short duration (i.e., 20-30 minutes), and the smoke from the show can dissipate rapidly given the coastal winds. A a water-based show is positioned further away from potential receptors (i.e., tress and guests), and therefore has a reduced potential for people (or wildlife) to be exposed to the highest concentration of smoke.

Drone Event

A no event alternative would not have any direct or indirect impacts to air quality levels in San Pero Bay.

No Event Alternative

A no event alternative would not have any direct or indirect impacts to air quality in Alamitos Bay.

Table 7. Air Quality Potential for Impact

Event Type	Air Quality Potential for Impact
Land-based Fireworks	3
Water-based Fireworks	2
Drones	1
No Show	1

3.0 NON-ENVIRONMENTAL FACTORS

The BBOB is a charity event that includes a firework show. Given that structure, the non-environmental factors evaluated for the AA were based on available information for similar events in southern California, and where possible, information from the event itself. The non-environmental factors evaluated include:

- Attendance
- Local Economic Impact
- Charitable Contribution

3.1 Attendance

There is little information available on the comparison between drone and firework events regarding attendace. However, there is information to suggest a preference for fireworks after some drone events. For instance, the City of Redondo Beach held a drone event in 2023 and is going back to Fireworks in 2024. Similarly, the City of Imperial Beach has also returned to fireworks as part of their 4th of July celebration. The City of Imperial Beach has also returned to fireworks from previous drone events, with their Chamber of Commerce stating, '*The 4th of July Fireworks show is part of the fabric that is Imperial Beach and helps foster community pride'* (IBC 2024).

Land-Based Firework

As discussed previously, a land based-firework show would have to occupy an area on land that was large enough to support the show, allow for a fire and physical safety barrier, and provide optimal sound level attenuation. In the conceptual example analyzed, that area was the parking lot located at 7203 E. Ocean Blvd. Regardless of the event location, a land-based event would reduce the viewing experience. The land-based option is expected to have low to medium attendance potential.

Figure 5. Vantage Point for a Land Based Fireworks Event

Water-Based Fireworks

A water-based fireworks event is the optimal alternative from an attendance standpoint and represents the highest potential attendance. The mid-bay location allows for a variety of excellent viewing locations and does not occupy any additional land or space available for public viewing. The current mid-bay location also does not entirely restrict boat access with the bay. Further, fireworks have a traditional appeal, are a long-standing tradition, and are often associated with celebrating major events like Independence Day. The bright, colorful displays, booming sounds, which arouse the senses represent the highest attendance potential.

Drone Event

A drone event would have to be held over San Pedro Bay, and not within Alamitos Bay due to safety concerns, so viewing can only be done from a distance. The Federal Aviation Administration (FAA) has a legal limit of 400-ft for both recreational and commercial drones (class G airspace). At an

altitude of 400-ft, it is likely that it would be possible to see the event from Alamitos Bay, and elsewhere, including Belmont Pier and Seal Beach, which reduced the need to come to Alamitos Bay. From an event organizer perspective, a drone show over the San Pedro Bay may have a slightly higher chance of cancelation due to wind versus an event in Alamitos Bay. Therefore, a drone show has a medium to low attendance potential.

No Event Alternative

A no event alternative would have a negative impact to attendance in Alamitos Bay due to the lack of an event

Table 8. Attendance Potential

Event Type	Attendance Potential
Land-based Fireworks	2
Water-based Fireworks	1
Drones	3
No Show	4

3.2 Local Economic Input

In 2023 San Deigo State University published the results of economic impact form the Big Bay Boom event in the Port of San Diego. The report suggests that between $59 million and $89 million are generated for the local economy as part of this event by between 200,000-300,000 visitors to the Bay during the event. That results in an estimated $12-$18 in tenant revenue for every port dollar spent on the event (SDSU 2023).

While this type of analysis is not available for the charity event in Alamitos, there is nothing to suggest that a similar type of analysis conducted in Alamitos would be significantly different. The Alamitos Bay event is estimated to bring in between 75,000- 100,000 people. Simple math based on the SDSU estimates results in an estimated $296 per visitor. Using this number, it is possible that the BBOB generates between $22 million and $29 million for the local economy. The SDSU Economic Impact report states that the Local economic impact is dependent on attendance, therefore the scoring for the non-environmental factor of local economic impact mirrors the scoring for the attendance evaluation factor.

Table 9. Local Economic Impact Potential

Event Type	Local Economic Impact Potential
Land-based Fireworks	2
Water-based Fireworks	1
Drones	3
No Show	4

3.3 Charitable Contribution Potential

The principal purpose of the BBOB event is to generate charitable contributions (i.e., donations) from both event attendees and local corporate sponsors. Without the fund raiser portion of the BBOB, the event would be just another firework show and Bar-b-que. In the last 11 years, the BBOB has generated over $2.1 million for Long Beach children's charities. Therefore, to not include charitable contributions as a factor of non-environmental analysis would be to omit perhaps the most critical part of the event, charitable contribution potential.

Land-based fireworks

A land-based show has a medium to high potential to generate charitable contributions. A firework show only goes 150-ft into the air, so there are less viewing opportunities outside the Bay to observe the event, and therefore necessitates coming down to Alamitos Bay. However, the land-based show and the relative distance from the event, would likely mean less visitors excitement when compared to fireworks from a barge directly in front of the event area.

Water-based Fireworks

A water-based show has the highest potential to generate charitable contributions. A water-based show combines the nearness to the event, while also encouraging the public to come down to the Bay.

Drone Event

Many current event sponsors have pledged not to support the BBOB event if a drone show replaced fireworks. Further, due to the distance between guests and the event, it is likely that less event tickets would be sold, reducing the overall donation amount. As previously stated, the principal purpose of the BBOB is to generate charitable contributions. Therefore, a drone event has a low to medium potential for generating charitable contributions.

Table 10. Charitable Contribution Potential

Event Type	Charitable Contribution Potential
Land-based Fireworks	2
Water-based Fireworks	1
Drones	3
No Show	4

4.0 SCORING SUMMARY

The results of scoring for seven environmental and non-environmental factors evaluated as part of the AA are provided in Table 9. The results of the analysis include environmental factors like water quality, and air quality, while integrating the event purpose and potential for attendance.

Table 11. Alternatives Scoring Table

Alternative	Fireworks		Drones	No Event
	Land	Water		
Environmental Factors				
Water Quality[1]	2	3	2	1
Trash and Debris[1]	2	2	2	1
Avian Resources[2]	2	2	3	1
Sound Levels[3]	3	2	1	1
Air Quality	3	2	1	1
Environmental Total	***12***	***11***	***9***	***5***
Non-Environmental Factors				
Attendance	2	1	3	4
Local Economic Input	2	1	3	4
Charitable Contribution	2	1	3	4
Non-environmental Total	***6***	***3***	***9***	***12***
Event Alternative Totals*	**18**	**14**	**18**	**17**

1- Includes NPDES monitoring requirements and existing monitoring data in the evaluation

2- Evaluated based on existing data and monitoring requirements in previous CDP

3- PTSD and Household pets not included in analysis

* Lowest Score is the Preferred Alternative

Results of the comparative analysis suggest that a land-based show would be less preferable to a water-based show or drone show, largely due to the increased proximity to people, which may lead to increased sound levels and reduce air quality. When a drone and water-based fireworks show are compared, results of the analysis suggest the drone event represented a lower potential for environmental impact. However, where the drone has a potential for impact, either the water or avian resources, it represents a more significant threat than fireworks for several reasons.

For example, due to the need to enforce a safety area around the drone event, a drone show would likely have to be held over San Pedro Bay. If the drones were to suffer some type of malfunction (technical, mechanical, etc.) a few hundred (or a thousand) drones in the receiving waters of San Padro Bay represents a more significant potential for impacting receiving waters (and by default habitat quality) than a 20-minute firework event.

Similarly, the potential for behavioral impacts to birds when frightened by a firework detonating is relatively high, and some studies have found it can cause birds to leave a nest. However, direct monitoring data from the site suggests that not only do birds return to the nests after the event, but

there have been no long-term impairments or observable behavioral effects as results of the show. Drones on the other hand, have been shown to act as an attractant for birds, which represents a much more significant threat to birds due to physical injury. Perhaps one of the species most at risk would be nocturnal bird of prey (Owls) which have multiple species listed as endangered, threatened, or at risk, and can travel long distances at night.

Perhaps the most important area of evaluation with respect to the event and which type is the preferred alternative, are the non-environmental factors of attendance, local economic impact, and charitable contributions potential. The BBOB event is a charity event, not simply fireworks show and Bar-b-que, therefore, inclusion of the financial and attendance factors is critical to the alterative analysis. A water-based firework event has the highest attendance potential as well as the highest potential for local economic input, and charitable contribution.

Based on the descriptive alternative analysis, **a Water-based Fireworks Event** is the preferred alternative. Analysis of the available information around three different event types, suggest that the water-based show has the potential to generate the most charitable contributions and local economic impact, consistent with the CEQA statement on sustainability, and creates the type of conditions that enable man and nature to coexist, but also to fulfill the social and economic requirements for future generations of kids in Long Beach.

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