STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Land Division
Honolulu, Hawaii 96813

October 23, 2015

Board of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

PSF No.: 15OD-166

OAHU

Issuance of Right-of-Entry Permit to Hawaii Explosives and Pyrotechnics, Inc. for Aerial Fireworks Display on November 10, 2015 at the beach fronting Kahala Hotel, Waialae, Honolulu, Oahu, Tax Map Key: (1) 3-5-023:seaward of 041

APPLICANT:

Hawaii Explosives and Pyrotechnics, Inc.

LEGAL REFERENCE:

Sections 171-55, Hawaii Revised Statutes, as amended.

LOCATION:

Portion of Government lands situated Waialae, Honolulu, Oahu, identified by Tax Map Key: (1) 3-5-023:seaward of 041, as shown on the attached map labeled **Exhibit A.**

AREA:

500 square feet, more or less, and a safety zone with a radius of approximately 250 feet around the firing site.

ZONING:

State Land Use District:	Urban
City and County of Honolulu LUO:	Resort (for abutting property)

TRUST LAND STATUS:

Section 5(b) lands of the Hawaii Admission Act
DHHL 30% entitlement lands pursuant to the Hawaii State Constitution: No

CURRENT USE STATUS:

Encumbered by Right-of-entry 4126 to Resorttrust Hawaii LLC, Permittee, for recreational and maintenance purposes.

CHARACTER OF USE:

Set up and firing of aerial fireworks display.

TERM:

Between 12:00 p.m. to 10:00 p.m. on November 10, 2015, Saturday.

RENTAL:

$550 (One-time payment. See Remarks Section for breakdown of costs).

COLLATERAL SECURITY DEPOSIT:

None.

CHAPTER 343 - ENVIRONMENTAL ASSESSMENT:

In accordance with Hawaii Administrative Rule Section 11-200-8 and the Exemption List for the Department of Land and Natural Resources approved by the Environmental Council and dated June 5, 2015, the subject request is exempt from the preparation of an environmental assessment pursuant to Exemption Class No. 1, Item 51. See **Exhibit B**.

DCCA VERIFICATION:

Place of business registration confirmed:	YES X	NO ___
Registered business name confirmed:	YES X	NO ___
Applicant in good standing confirmed:	YES X	NO ___

REMARKS:

Around 1963, the developer of the abutting hotel parcel obtained the approval from the State to excavate the rock coastline and develop a beach and two small islets. The Board approved the agreement at its meeting on January 25, 1963. Subsequent to 1968, revocable permits were issued to the respective hotel owners over the subject location for recreational and maintenance purposes.

At its meeting of October 10, 2014, under agenda item D-5, the Board approved as amended the issuance of a revocable permit for recreational and maintenance purposes to Resorttrust Hawaii, LLC; and the issuance of a management right-of-entry during the interim period until the issuance

of a new revocable permit is executed.

Hawaii Explosives & Pyrotechnics, Inc. is requesting the issuance of a right-of-entry permit for the set-up and firing of fireworks display on the seawall groin fronting the Kahala Hotel for the Special Event Fireworks Display on November 10, 2015.

The set-up and firing of the aerial fireworks display for this event will include the staging area and the firing of the aerial fireworks display from a platform on the seawall groin fronting the Kahala Hotel consisting of 500 square feet from 12:00 p.m. to 10:00 p.m. on November 10, 2015.

In addition, staff is recommending that a charge of $500 be imposed to cover the exclusive use of the safety zone as shown on Exhibit A. The total cost for this right-of-entry, which includes the staging area of $50 will be $550.

As in previous fireworks events, the Applicant will provide a courtesy notice to the manager of the adjacent Kahala Beach Condominium, who will post the notice on the bulletin board within the condominium regarding the November 10, 2015 event.

At the September 25, 2015 Board meeting (item D-11) for an identical request for firework display, testimony was provided by a member of the general public regarding impact to the surroundings. The concerns included the impact of after-explosion fallout to the ocean marine life and dolphin enclosure, and noise effects on the dolphins. Responses from the Division of Aquatic Resources, Kahala's Dolphin Quest, and Hawaii Explosives & Pyrotechnics, Inc. to the testimony showed no adverse effects to marine life in the vicinity, and no adverse effects to the dolphins' health or well-being. See **Exhibit C-1 to C-4**.

Applicant has not had a lease, permit, easement or other disposition of State lands terminated within the past five years due to non-compliance with such terms and conditions. No comments were solicited from government or community agencies. There are no pertinent issues or concerns.

Staff does not have any objection to this request.

RECOMMENDATION: That the Board:

1. Declare that, after considering the potential effects of the proposed disposition as provided by Chapter 343, HRS, and Chapter 11-200, HAR, this project will probably have minimal or no significant effect on the environment and is therefore exempt from the preparation of an environmental assessment.

2. Authorize the issuance of a right-of-entry permit to Hawaii Explosives and Pyrotechnics, Inc. on November 10, 2015 covering the subject area for aerial fireworks display purposes under the terms and conditions cited above, which are by this reference incorporated herein and further subject to the following:

A. The standard terms and conditions of the most current right-of-entry permit form, as may be amended from time to time; and

B. Such other terms and conditions as may be prescribed by the Chairperson to best serve the interests of the State.

Respectfully Submitted,

Cal Miyahara
Shoreline Disposition Specialist

APPROVED FOR SUBMITTAL:

Suzanne D. Case, Chairperson

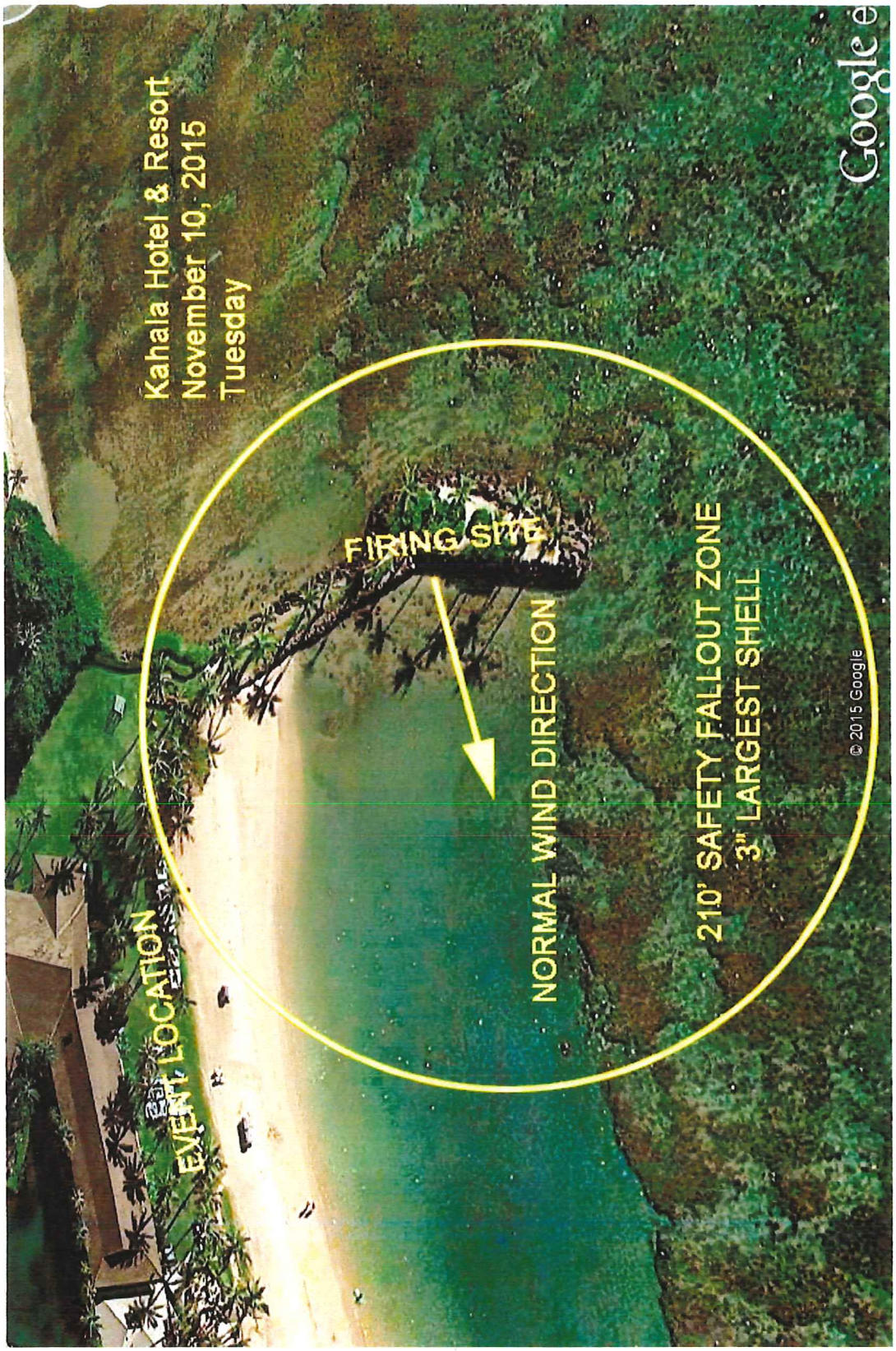

Kahala Hotel & Resort
November 10, 2015
Tuesday
EVENT LOCATION
FIRING SITE
NORMAL WIND DIRECTION
210' SAFETY FALLOUT ZONE
3" LARGEST SHELL
© 2015 Google
Google

EXHIBIT "A"

EXEMPTION NOTIFICATION

Regarding the preparation of an environmental assessment pursuant to Chapter 343, HRS and Chapter 11-200, HAR

Project Title:	Issuance of right-of-entry for aerial fireworks display fronting the Kahala Hotel on November 10, 2015.
Project / Reference No.:	PSF 15OD-166
Project Location:	Waialae, Honolulu, Oahu, TMK (1) 3-5-023:seaward of 041.
Project Description:	Aerial Fireworks Display fronting Kahala Hotel on November 10, 2015.
Chap. 343 Trigger(s):	Use of State Land
Exemption Class No.:	In accordance with Hawaii Administrative Rule Section 11-200-8 and the Exemption List for the Department of Land and Natural Resources approved by the Environmental Council and dated June 5, 2015, the subject request is exempt from the preparation of an environmental assessment pursuant to Exemption Class No. 1, Item 51. In the past, permits were periodically issued for conducting aerial fireworks display on the beach in this area, which have resulted in no known significant impacts to the natural and environmental resources in the area. As such staff believes that the proposed event would involve negligible or no expansion or change in use of the subject area beyond that previously existing.
Consulted Parties:	Not applicable
Recommendation:	It is recommended that the Board find that this project will probably have minimal or no significant effect on the environment and is presumed to be exempt from the preparation of an environmental assessment.

Suzanne D. Case, Chairperson
Date 10/1/15

EXHIBIT "B"

"It is recommended that the Board find that this project will probably have minimal or no significant effect on the environment and is presumed to be exempt from the preparation of an environmental assessment." -Kahala

It is recommended that the board would indeed find that fireworks have a major impact on the environment found by scientific studies, and research for the following reasons as they pollute the air, land, and water.

> ***It is found that within an hour after firework work displays levels of Strontium in the air increased 120 times, Magnesium 22 times, Barium 12 times, Potassium 11 times, and Copper 6 times more than the amount present in the air before the event.*** *Strontium was found to be the best tracer in this study because it measured very high during the event and much lower at other time intervals, which indicated that it was mostly a result of the fireworks display.*

"Another study found that firework events brought air pollution spikes in suspended particles, Nitric oxide (NO), Sulfur dioxide (SO2), and created and dispersed an aerosol cloud hosting a range of metallic elements. The researchers found that although the "recreational pollution" from fireworks is transient in nature, the pollutants are highly concentrated and add significantly to the total yearly metal emissions and the particles are on average small enough to be easily inhaled which poses a health risk to sensitive individuals."

Researchers have found that fireworks can create a burst of ozone, which is an extremely reactive greenhouse gas molecule that attacks and irritates the lungs.

A study in 2010 also showed that the risk for cardiovascular mortality increased 125.11% after the display of fireworks.

As I mentioned before fireworks are dangerous to not only the air but also the water where the firework will eventually fallout and contaminate water supplies and residue on the ground that can be carried away by rain and end up in our lakes, rivers, or oceans.

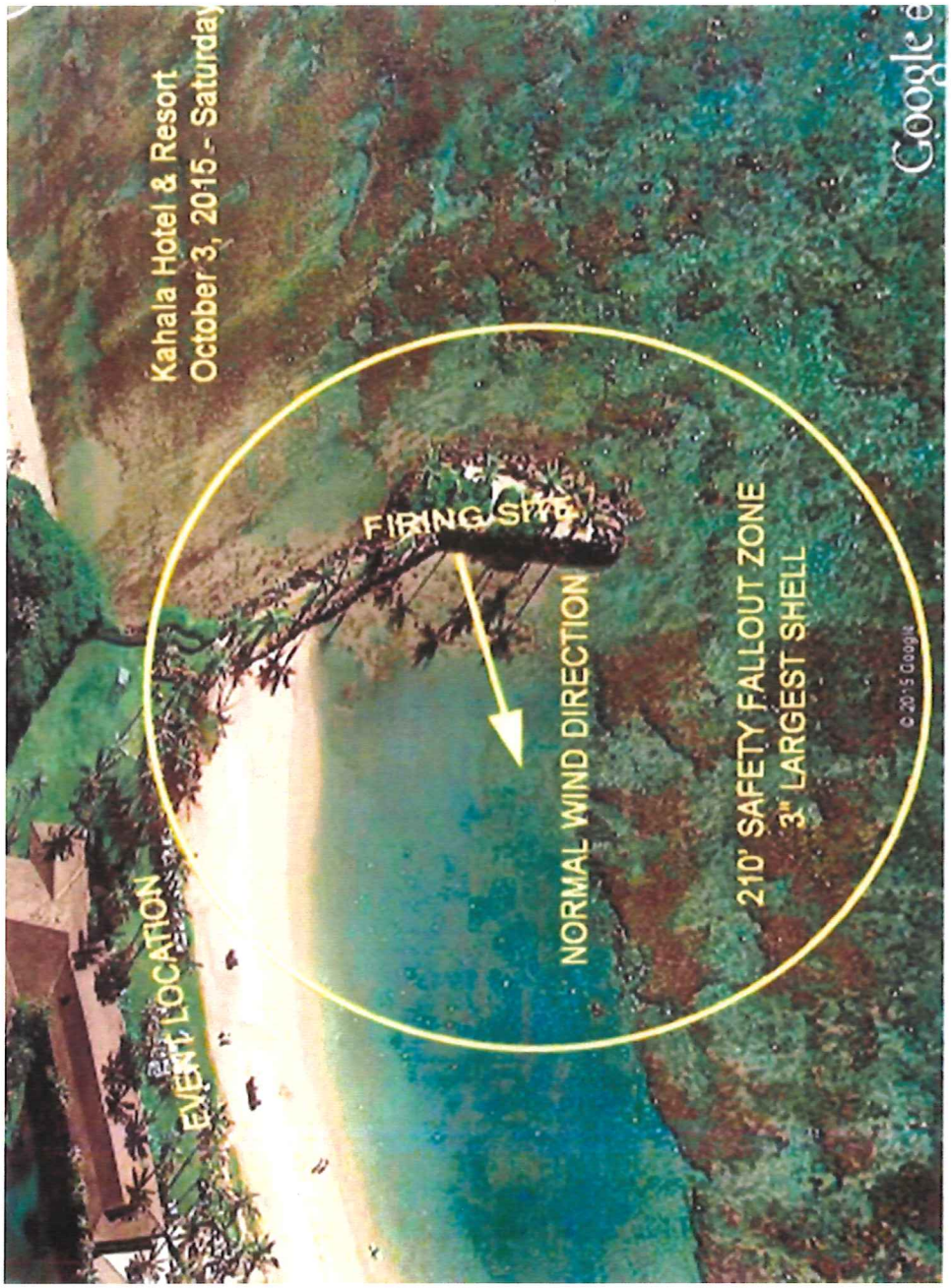
In the picture generously provided by Kahala Hotel you see that with the normal wind direction pushes all the toxins right over the ocean and as you can see in the picture is right above reef so all these toxins previously mentioned will be put into the air and eventually subside right into the reef that is not only full of ocean life but right where all guests spend their time swimming.

Noise Pollution: Fireworks can be loud and the vibrations can travel far. Fireworks can exceed 140 decibels and noise at 85 decibels or above can damage hearing. Where it is also argued that the noise affects wildlife greatly.

EXHIBIT "C-1"

***Since 85 decibels is found to be damaging to human ears then what can 140 decibals do to animals that are extremely more sensitive to sound than we are?**

In the picture provided by Kahala at the very edge of the picture you can notice the corner of their very own dolphin quest where 7 dolphins live in a very small enclosure less than 400 ft. away from the firing site.



I found this extremely concerning as Noise pollution is one of the biggest threats to marine mammals as sound is their primary sense making them extremely sensitive to sound and noise.

The sound given off by fireworks is compared to that of the Navy Sonar testing in the oceans, these tests have cost the life of hundreds of whales and dolphins because animals will literally stop eating or strand due to disorientation and stress, about a week ago the U.S. Navy put an end to sonar testing in the oceans because of the harm it brought to marine mammals. Animals in the ocean are in able to get away from the noise yet it still affects them in extreme ways. If sonar testing can be comparable to the fireworks this could affect the dolphins in this small enclosure greatly, and their mental well being and lives are being put at risk for a firework display.

While visiting the Kahala Dolphin Quest recently I was told by a trainer that it was better to have dolphins in captivity because this way they can keep them safe from pollution in the ocean.

How could they possibly be keeping them safe in an environment and facility that allows such events to happen?

-Dolphins enclosure is 13ft deep at the deepest point and they spend 90% of their time near the surface, so dolphins will be exposed to above water noise. – Dr. Ingrid Visser

Who will be watching the dolphins?

If the trainers are around then dolphins will have their head out of the water as they are trained to feed this way.

If trainers aren't around then how will they monitor the dolphins and their well-being?

Kahala also mentions on their website that quote "As animal advocates, we share our love for these magnificent animals with our guests, while instilling in them an equal passion to help protect marine animals and preserve their fragile ocean environments."

If Kahala and dolphin quest was really trying to keep their dolphins in a safer environment away from pollution I believe that having fireworks at their facility is one of thee worst ways to keep their dolphins safe and in somewhat of good condition mentally. It's hard for me to comprehend a facility that says they care so much for their animals would want to conduct such a practice that could potentially effect their animals in extreme ways, with no where to run or get away from the noise.

***How would you make sure these toxins do not end up in your animal enclosures?**

On Kahalas website it also mentions that the dolphins, turtles, stingrays and fish are given new water every 6-8 hours.

***If it takes less than an hour for the toxins of the fireworks to reach land and water then does this mean all the marine animals in possession of the Kahala will be living in toxic water for up to 8 hours?**

The area where the water is filtered is the same exact area where the firing site is. Will the toxic water be filtered out with even more toxic water?

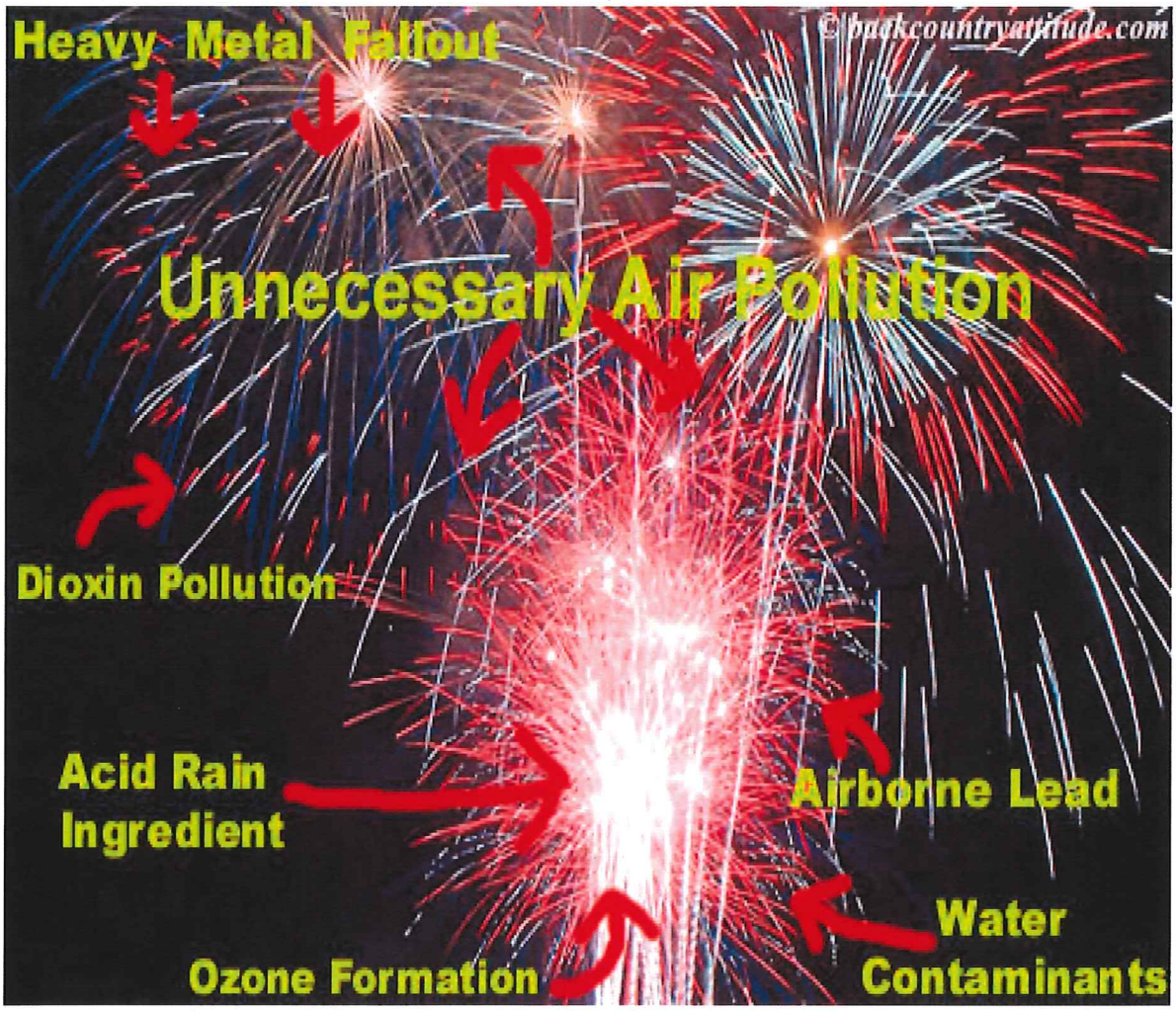
How will the water be checked for possible toxicity?

It also came to my attention that there beloved animals are not a concern to them according to this request and I would like to recommend to both the Board and Kahala who claims to be a hotel committed to the community by preserving the environment to both rethink your decision on behalf of the environment, the land

and the animals being held in the facility.

If fireworks are more important than the animals in their care then maybe Kahala Dolphin Quest should not be in possession to these animals.

Is a few minutes of pyrotechnic entertainment really worth needlessly polluting the environment?



Toxic Element	Fireworks Usage	Toxic Effect of Fallout Dust & Fumes
Aluminum	brilliant whites	Contact dermatitis, bioaccumulation
Antimony sulfide	glitter effects	Toxic smoke, possible carcinogen
Arsenic compounds	Used as colorants. Sadly still out there. [3]	Toxic ash can cause lung cancer, skin irritation and wart formation.
Barium Nitrate	glittering greens	Poisonous. Fumes can irritate respiratory tract. Possible radioactive fallout. [4]
Copper compounds	blues	Polychlorinated dioxins and dibenzofurans. [5]Can bioaccumulate. Cancer risk.
Hexachlorobenzene (HCB) [5]	Use was supposed to be banned globally.	Persistent environmental toxin. Is a carcinogen, mutagen and a reproductive hazard [13].
Lead Dioxide / Nitrate / Chloride	oxidizer	Bioaccumulation, developmental danger for kids & unborn babes, may remain airborne for days, poisonous to plants & animals
Lithium compounds	blazing reds	Toxic and irritating fumes when burned
Mercury (Mercurous chloride)	chlorine donor	Toxic heavy metal. Can bioaccumulate.
Nitric oxide	fireworks byproduct [6]	Toxic by inhalation. Is a free radical
Nitrogen dioxide	fireworks byproduct [6]	Highly toxic by inhalation. SIDS risk [8].
Ozone	fireworks byproduct [7]	Greenhouse gas that attacks & irritates lungs
Perchlorate - Ammonium & Potassium	propellant / oxidizer	Can contaminate ground & surface waters, can cause thyroid problems in humans & animals
Potassium Nitrate	in black powder	Toxic dusts, carcinogenic sulfur-coal compounds
Strontium compounds	blazing reds	Can replace calcium in body. Strontium chloride is slightly toxic.
Sulfur Dioxide	gaseous byproduct of sulfur combustion	Acid rain from sulphuric acid affects water sources, vegetation & causes property damage. SIDS risk [8].

Fireworks Alternatives

- How about we protect our health and the health of our outdoor environment by switching to an environmentally friendly laser light show?
- How about a block party to celebrate?
- A stunt kite show at night with some LED's would be cool.
- Try watching the stars or organize an outdoor movie.
- Some people are organizing community drum circles and drumming instead of lighting fireworks.
- Indoor fireworks projectors are small devices that can be used indoors that produce convincing reproductions of firework displays as well as simulating the noise of real fireworks.
- Electronic fireworks display lamps produce colorful explosions of light all night long without the pollution or noise of real fireworks.
- Electronic pyrotechnics don't use explosives either. Electronic blasts can form a canopy up to 25 feet in the air that rain down glitter, confetti, rose petals or even candy.
- Just imagine all the possible more meaningful and beneficial ways we could use all the money spent on fireworks that wouldn't pollute our environment.

Firework alternatives taken from BackCountryAttitude.com

Resources used by the site:

"Fireworks." National Fire Protection Association, April 2007

American Fireworks Standards Laboratory Standards, September 2006, page I

Steinhauser, Georg. "Heavy metals from pyrotechnics in New Years Eve snow." Atmospheric Environment Volume 42, Issue 37, December 2008

Steinhauser G and Musilek A. "Do pyrotechnics contain radium?" Environ Res. Lett. 4 034006 July-September 2009

O. Fleischer. "Release of polychlorinated dibenzo-p-dioxins and dibenzofurans by setting off fireworks." ChemosphereVolume 39, Issue 6, September 1999

Russell, Michael S. The Chemistry of Fireworks. 2000

Attri, Arun K. "Microclimate: Formation of Ozone by Fireworks." Nature Volume 411, June 28, 2001

Dales, Robert. "Air Pollution and Sudden Infant Death Syndrome." Pediatrics Vol. 113 No. 6 June 2004

Vecchi, Roberta. "The Impact of Fireworks on Airborne Particles." Atmospheric Environment Volume 42, Issue 6, February 2008

Moreno, Teresa. "Recreational atmospheric pollution episodes: Inhalable metalliferous particles from firework displays." Atmospheric Environment Volume 41, Issue 5, February 2007

Godri KJ, Green DC. "Particulate Oxidative Burden Associated with Firework Activity." Environmental Science & Technology, October 1, 2010

B. Thakur. "Air pollution from fireworks during festival of lights (Deepawali) in Howrah, India - a case study."Atmósfera, Vol 23, No 4, 2010

"Hexachlorobenzene (HCB) in Fireworks - Guidance Note" The Environment Agency, September 2010

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

October 1, 2015

MEMORANDUM

To: Suzanne Case, Chairperson

From: Alton Miyasaka, Acting Administrator

Subject: Analysis of Ms. Janelle Van Ruiten Opposition Testimony to Board of Land & Natural Resources at its Meeting of September 25, 2015 on Item D.11 Issuance of Right-of-Entry Permit to Hawai'i Explosives and Pyrotechnics, Inc. for Aerial Fireworks Display on October 3, 2015 at the beach fronting Kahala Hotel, Wai'alae, Honolulu, O'ahu, Tax Map Key: (1) 3-5-023:seaward of 041.

Ms Van ruiten's concerns appear to generally be within the following categories:
1) Effects of fireworks noise on dolphins;

2) Effects of fireworks chemical residuals on dolphins; and

3) The dolphins being held in enclosed ponds intensify such effects.

There has not been any study that examined the effects of fireworks on dolphins in enclosed facilities that I am aware of. There are, however, opinions from the National Marine Fisheries Service on the effects of fireworks displays on protected species. These published opinions are the most relevant information found on this subject. The opinion was specifically on the effects of commercial fireworks displays in the Monterey Bay National Marine Sanctuary (MBNMS). It should be noted that the studies have not been on dolphins due to the fact that dolphins are known to be in the vicinity of the MBNMS but none were observed during times of fireworks and there has not been a report of dead or injured dolphins so they were not considered further in the document. Seals observed in the area will leave during fireworks but return between 4 to 15 hours after the fireworks end.[3]

There are also extensive studies on related effects of the NASA space program on various wildlife.[2, 6] While the comparison of fireworks to the NASA space program may be several orders of magnitude different, there may be useful insights from the studies on the space program impacts on wildlife.

EXHIBIT "C-2"

Noise effects

The air/water interface reflects most of the sound and there is no risk to dolphins.

Inquiries with the Hawaii Institute of Marine Biology revealed the following information. Aerial fireworks exploding in air creates a noise of about 140 dB. This sound doesn't transfer as 140 dB in water as the air/water interface reflects most of the sound. Animals at HIMB do not show a startle reflex until an impulse sound exceeding 150 dB is made underwater. (Paul Nachtigall, HIMB)

The highest acoustic noise levels for the Space Shuttle orbiter is 160dB. Safe human noise levels are 115dB according to Dept of Labor safety standards. Protected species around the Kennedy space center includes marine turtles and manatee.[1] While these species are not echo locators, studies do not indicate significant adverse effects from noise levels even at these levels. The information from NOAA also supports the attenuating effects of the air/water interface.

The MBNMS has been conducting pre and post event monitoring of the fireworks for more than eight years and have not recorded any significant injuries or death of protected species. Dolphins have evolved for hearing in water but while they can hear certain sounds, like whistles, from trainers above water, these high frequency sounds are different from the low frequencies created by explosions. Age also plays a role in cetacean hearing as older animals experience hearing loss similar to humans.[5]

The primary impact to wildlife noted in past observation reports by MBNMS staff is the disturbance of marine mammals and seabirds from the light and sound effects of the exploding aerial shells. The loud sound bursts and pressure waves created by the exploding shells appear to cause more wildlife disturbance than the illumination effects. In particular, the percussive aerial salute shells have been observed to elicit a strong flight response in California sea lions and marine birds in the vicinity of the impact area (within 800 yards of the launch site).[3] While this behavioral response occurs, the sea lions and marine birds return to the site so it appears to be a temporary response.

Ms Van Ruiten references existing studies on the noise levels produced by firework events and concludes that the noise levels are harmful to dolphins. Neither her nor the referenced studies take into account the air/water interface attenuation of the noise moving from the air into the water and that this interface reduces the harmful effects of the noise on dolphins. The information provided does not support the contention that the dolphins are close enough to be harmed from the fireworks noise effects.

Ms Van Ruiten also states that the sound from fireworks is comparable to the Navy Sonar but does not provide any information that supports that contention.

Based on the discussion above, the fireworks sound levels are not expected to cause harm to dolphins because they are short bursts, temporary in duration, occur above water, and no information is provided that would support Ms. Van ruiten's contention.

Residue effects

Chemical residue from fireworks does not pose a significant risk to the marine environment.

The largest commercial aerial shells used within the MBNMS are 10-12 inches in diameter and reach a maximum altitude of 1000 feet AGL. The bursting radius of the largest shells is approximately 850 feet. The impact area can extend from 1 to 2 statute miles from the center of the detonation point depending on the size of the shell, height of the explosions, type of explosions, wind direction, atmospheric conditions, and local topography.[3]

Chemical residue is produced in the form of smoke, airborne particulates, fine solids, and slag (spent chemical waste material that drips from the deployment canister/launcher and cools to a solid form). The fallout area for chemical residue is unknown, but is probably similar to that for solid debris. Similar to high level aerial shells, the chemical components of low-level aerial devices produce chemical residue that can migrate to ocean waters as a result of fallout. The point of entry would likely be within a small radius (about 100 yards) of the launch site.

The MBNMS has found only one scientific study directed specifically at the potential impacts of chemical residue from fireworks upon the environment. A 1992 Florida study (DeBusk et al, 1992) indicates that chemical residues (fireworks decomposition products) do result from fireworks displays and can be measured under certain circumstances. The report, prepared for the Walt Disney Corporation in 1992, presented the results of a 10-year study of the impacts of fireworks decomposition products (chemical residue) upon an aquatic environment.

Researchers studied a small lake in Florida subjected to two thousand fireworks shows over a ten-year period to measure key chemical levels in the lake. The report concluded that detectable amounts of barium, strontium, and antimony had increased in the lake but not to levels considered harmful to aquatic biota. The report further suggested that "environmental impacts from fireworks decomposition products typically will be negligible in locations that conduct fireworks displays infrequently". Based on the findings of this report, the lack of any evidence that fireworks displays within the MBNMS have degraded water quality, and the fact that the chemical byproducts of less frequent fireworks displays in an open marine system are even less likely to accumulate to a harmful level than those described in the report, NMFS and the MBNMS believe that chemical residue from fireworks does not pose a significant risk to the marine environment. No negative impacts to water quality have been detected.[3]

Ms Van Ruiten has concerns that the dolphins are held too close to the fireworks display and would be within the dispersion field yet does not provide any information how large that dispersion field is and if the dolphins are within that field. Based on the information from the other studies, the dolphins, at 400 feet from the launch site, are likely not subject to intense fallout at this distance.

She also has concerns about the "toxic waters" that are created when the fireworks residue fall into the water and turn the waters toxic. While there may be legitimate concerns that chemical residues may be falling into the holding pond, there is no information on the level of residues or if those residues are creating a toxicity problem.

One could suppose that the source of the residue is an explosion and only a small portion of that residue would fall within the ponds. The information provided indicates the launch site is about 400 feet from the holding ponds. The primary source would not be the launch site but at the point of explosion in the air. Also, the distance of the ponds from the primary source is not determined but is likely in excess of 400 feet.

We note that the source explosion disperses the chemicals, the fallout of those chemical would have to float over 400 feet away, and the water in the ponds are exchanged every 6-8 hours. It is difficult to imagine that the water would turn toxic to the dolphins. Dolphins do not respire underwater but would be subject to skin irritations if the water were toxic. Fish, on the other hand, do respire underwater and would be more directly exposed to toxic water than the dolphins. Also, being much smaller, the smaller reef fish would be more sensitive to such toxicity than the larger dolphins. Existing studies do not indicate that fish are being affected by chemical residue.

Enclosed pond effects

There is not expected to be any difference between the water quality in the ponds and outside in the ocean. Both are not expected to be a risk to the dolphins.

Ms Van Ruiten has concerns that the dolphins, being trapped in the enclosed ponds, would be subject to concentrated residue compared to the open ocean. Because the pond is drawing water from the nearby ocean, where the residues are also present, this would increase the concentration of residue in the pond.

The suggestion that the pond, with their circulating system, somehow concentrates the residue, would not be supported. The residues are likely suspended in the water column and the exchange of water would mean that whatever concentration exists in the ocean would also exist in the pond water and would be flushed out during the water exchange. Basically, the residue concentrations should be the same in the ocean compared to the pond. There is no reason to believe that the pond would act as a filter to somehow concentration the residuals. As previously explained in the residue effects section, the chemical residues in the water were not found to cause a significant risk to the marine environment. If the residues in the ocean are not expected to cause a significant risk, then similarly, they would not be a risk in the pond.

List of References

1. Dr. Paul Nachtigall, HIMB; personnel communication

2. Breininger, David R. et al. 2014; Ecological Impacts of the Space Shuttle Program at John F. Kennedy Space Center, Florida

3. Federal Register, Vol. 77, No. 103, Tuesday, May 29, 2012,pg. 31537; Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Coastal Commercial Fireworks Displays at Monterey Bay National Marine Sanctuary, CA

4. National Oceanic and Atmospheric Administration National Marine Fisheries Service and Monterey Bay National Marine Sanctuary; June, 2006; ENVIRONMENTAL ASSESSMENT OF THE ISSUANCE OF A SMALL TAKE REGULATIONS AND LETTERS OF AUTHORIZATION AND THE ISSUANCE OF NATIONAL MARINE SANCTUARY AUTHORIZATIONS FOR COASTAL COMMERCIAL FIREWORKS DISPLAYS WITHIN THE MONTEREY BAY NATIONAL MARINE SANCTUARY, CALIFORNIA

Other references consulted:

5. NOAA (7/23/2015), DRAFT Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing Underwater Acoustic Threshold Levels for Onset of Permanent and Temporary Threshold Shifts ; Revised version for Second Public Comment Period

6. Huynh, Thomas et al.; 12/30/2004; Final Environmental Assessment for Minuteman III Modification

7.Evans (ed) 2013; *PROCEEDINGS OF THE ECS WORKSHOP* CHEMICAL POLLUTION AND MARINE MAMMALS; European Cetacean Society's 25th Annual Conference, Cadiz, Spain, 20th March 2011; ECS SPECIAL PUBLICATION SERIES NO. 55

8. Federal Register, Vol. 77, No. 64, Tuesday, April 3, 2012,pg. 19976; Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Coastal Commercial Fireworks Displays at Monterey Bay National Marine Sanctuary, CA

9. Monterey Bay National Marine Sanctuary, NOAA, 2012; Reporting Required by the USFWS Biological Opinion and the NMFS Incidental Harassment Authorization for Fireworks Displays within Monterey Bay National Marine Sanctuary

DOLPHIN QUEST
Touching hearts and minds

September 30, 2015

Stephanie Pascual, Vice President
Hawaii Explosives & Pyrotechnics, Inc.
P.O. Box 1244
Keaau, HI 96749

Re: Dolphin Quest's response to dolphin welfare concerns raised in testimony submitted to Hawaii's Department of Land and Natural Resources

Dear Stephanie Pascual,

Thank you for allowing Dolphin Quest the opportunity to respond to the concerns raised during your request for a fireworks display at The Kahala Hotel & Resort.

Dolphin Quest and The Kahala Hotel & Resort are absolutely committed to providing our animals with a safe and enriching environment where they continue to thrive. Our highly skilled animal behaviorists have been present at previous fireworks displays and will be present during and after the upcoming fireworks display to ensure the comfort, safety, and welfare of the animals. They will be closely monitoring the animals as well as their ocean water lagoon to ensure that no debris from the fireworks enter the water.

Our animals have had previous experience with fireworks on property and the dolphins have not demonstrated any changes in behavior or exhibited any signs of a negative impact associated with the fireworks display. Our veterinary staff do not anticipate any direct impact on the water source to the lagoon habitat or the animal's health, safety, or welfare. We would be the first to notify our hotel partner if we had any concerns.

With regard to the issue raised about noise pollution from fireworks displays affecting the dolphins, here is the National Marine Fisheries Services' position on coastal fireworks displays and the unlikely impact on cetaceans in the area:

> *"Because sound attenuates rapidly across the air-water interface, these animals would likely not encounter the effects of fireworks except when surfacing for air. NMFS does not anticipate the take (defined by the Marine Mammal Protection Act as "to hunt, harass, capture, or kill" any marine mammal or attempt to do so.") of any cetacean (due to the fireworks) and they are not addressed further in this document." Fed Reg. Vo. 77, No. 13093 pg. 31537. (May 29, 2012).*

Sincerely,

Laura Russell
General Manager
Dolphin Quest Oahu

EXHIBIT "C-3"

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The Environmental Impact of Professional Fireworks Displays

Like many other objects created and consumed by humans, the use of fireworks has an impact on the environment. The devices that produce the beautiful colors and large booms are manufactured from a number of chemical compounds. Professional fireworks displays typically contain many of these devices set off over a large field or body of water within a short duration—often lasting less than ten minutes.

The pyrotechnic reaction within a fireworks device is comprised of two primary ingredients: the fuel and the oxidizer. By adding energy, an exothermic chemical reaction occurs and the fuel contained within the compound is oxidized. The resultant reaction results in the emission of heat, certain wavelengths of light and, depending upon the speed of the reaction, audible sound waves. The resultant derivative compounds from these reactions vary depending upon the originating composition.

The two primary oxidizers utilized in display fireworks are Nitrates and Perchlorates. Nitrates—Potassium Nitrate (Saltpeter) in particular—is a primary component of black powder, which serves as the most common propellant and can comprise as much as 40 percent of the total weight of the device. Potassium Nitrate is typically mixed with Charcoal and Sulfur as fuels. Perchlorates are typically used to oxidize the metal salts that produce the colors. Other fuels commonly used include Strontium Nitrate, Aluminum, Barium Chloride, Iron and Copper Chloride. Derivatives of particular interest from these reactions include Nitrogen Oxide, Sulfur Dioxide, Ozone, Carbon Monoxide, and Carbon Dioxide. In addition a small amount of particulate matter is produced containing compounds such as Potassium Oxide, Barium Chloride, Strontium Chloride, and Aluminum Oxide. Important to note is that the quantity of fuels in a typical fireworks device is rather small, typically less than 5% of the total weight of the device. Other non-reactive components present include binders and paper compounds.

While the emissions from pyrotechnic reactions are pollutants, the quantity produced in a typical fireworks display is small in comparison to other common sources. For example, the emission of these gases and particulates from a coal burning power plant in one day is far greater than the emissions of one 5-minute long fireworks show. Moreover, studies have indicated that hazardous concentrations of these gases quickly dissipate to background levels in both a short time and distance from the discharge site.

EXHIBIT "C-4"

Testing has shown particulate matter concentrations are also small due to their dispersal over a relatively large area, and compounds present within this particulate are relatively inert. Again, the concentration of particulates is miniscule in comparison to other common sources such as automobile exhaust emissions.

One area of concern that studies have identified is perchlorate contamination. Residual amounts of the oxidizer have been detected at various sites following fireworks displays. Since perchlorates are highly soluble in water, this is a particular concern for areas where the watershed incorporates drinking water sources or in small, closed bodies of water such as ponds. In larger bodies of water or areas of high circulation (such as the ocean) however, the high solubility actually benefits dispersal and minimizes impact.

Pollution is measured as the relationship between a compound's toxicity and its concentration in a given area. The natural dispersion of the compounds present in pyrotechnic products during the oxidation process and their limited use over time in any single area causes the actual level of pollution to be relatively small--especially when compared to other forms of industry performed in a single location over a long period of time. As with any activity, progress must be made to mitigate any adverse impact on the environment. In recent years, there are many compounds which have been eliminated from fireworks compositions in order to increase safety and reduce toxicity, such as arsenic, chlorates, and lead. There has also been significant progress made recently in eliminating the use of perchlorates as oxidizers within the industry, though there are still significant economic barriers to overcome. While the adverse impact of fireworks on the environment is not zero, the quantity of pollutants generated and their infrequency of use makes them a fairly insignificant contributor to the adverse environmental impacts of modern human life.

References:

"Impact of Ambient Air Quality by Outdoor Fireworks Displays in Hong Kong", Andrew Tang, Wilson Mau, October 2013

"Evaluation of Perchlorate Contamination at a Fireworks Display", Massachusetts Department of Environmental Protection, August 2007

"Perchlorate: Health Effects and Technologies for Its Removal from Water Resources", Asha Srinivasan and Thiruvenkatachari Viraraghavan, April 2009

"Fireworks and Particulate Matter ($PM_{2.5}$)", Huang Chaxiang and Yang Lin, October 2013

"Perchlorate Behavior in a Municipal Lake Following Fireworks Displays", Richard T. Wilkin, Dennis D. Fine, and Nicole G. Burnett, May 2007