File Number: 22629

Applicant Information

Affiliation:	Sea Research Foundation, Inc. dba Mystic Aquarium
City,State,Zip:	Mystic, CT 06355

Project Information

Report Number:	2 (Annual Report)
Report Period:	08/27/2020 to 08/31/2021
Report Status:	**Submitted**
File Number:	22629
Project Title:	Health-related Research on beluga whales conducted at Mystic Aquarium to contribute knowledge and inform management and recovery of wild beluga populations...[see attached application for full title]
Project Status:	New
Previous Federal or State Permit/Authorization:	Scientific Research/Enhancement Permit #42-1908 (Expired 1/31/2014)
Permit/Authorization Requested:	• MMPA Research/Enhancement permit - Issued
Where will activities occur?	US Locations including offshore waters
Research Timeframe:	**Start:** 08/27/2020 **End:** 08/31/2025
Sampling Season/Project Duration:	Import is proposed to occur in January 2020. This permit is for continuous marine mammal health related research conducted on a daily basis at Mystic Aquarium. Research will occur continuously; there is no specific season or duration of the research. To gain the maximum knowledge that can be applied for beluga conservation, we are requesting the 5-year maximum for the permit. Training for research

activities is already part of the Mystic Aquarium husbandry protocol and will occur on a daily basis during regular scheduled training sessions.

Location/Take Information

Location

Research Area: Captivity
Location Description: Authorized annual research takes at Mystic Aquarium (or Georgia Aquarium) for the five beluga whales identified in Appendix 1, Table. See the details column for more information.

Take Information

*	**Line Number:**	1
	Species:	Whale, beluga
	Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
	Production/Origin:	Captive
	Lifestage:	Adult/ Juvenile
	Sex:	Male and Female
	Expected Take:	5
	Actual Take:	5
	Indirect Mortality:	
	Actual Indirect Mortality:	
	Take Action:	Captive animals (research, enhancement, public display)
	Observe/Collect Method:	Captive
	Procedure:	Sample, blood
	Transport:	N/A
	Begin Date:	08/27/2020
	End Date:	08/31/2021
	Details:	Studies 1,2,5. See Appendix 1, Table 2 of permit for details.

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*	**Line Number:**	2
	Species:	Whale, beluga
	Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
	Production/Origin:	Captive
	Lifestage:	Adult/ Juvenile
	Sex:	Male and Female
	Expected Take:	5
	Actual Take:	5
	Indirect Mortality:	

Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Sample, exhaled air
Transport:	N/A
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Studies 2,3,5. See Appendix 1, Table 2 of permit for details.

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* **Line Number:**	3
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive
Lifestage:	Adult/ Juvenile
Sex:	Male and Female
Expected Take:	5
Actual Take:	5
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Other
Transport:	N/A
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Study 2. Other = Sample, saliva. See Appendix 1, Table 2 of permit for details.

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* **Line Number:**	4
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive
Lifestage:	Adult/ Juvenile
Sex:	Male and Female
Expected Take:	5
Actual Take:	0
Indirect Mortality:	

Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Sample, fecal
Transport:	N/A
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Study 2. See Appendix 1, Table 2 of permit for details.

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* **Line Number:**	5
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive
Lifestage:	Adult/ Juvenile
Sex:	Male and Female
Expected Take:	5
Actual Take:	0
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Other
Transport:	N/A
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Study 2. Other = Sample, skin. Skin scrapes for development, validation, and measurement of gene expression (Study 2): 4x per week x 50 weeks = 200 samples/year (200 takes/whale/year).

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* **Line Number:**	6
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive
Lifestage:	Adult/ Juvenile
Sex:	Male and Female
Expected Take:	5
Actual Take:	5

	Indirect Mortality:	
	Actual Indirect Mortality:	
	Take Action:	Captive animals (research, enhancement, public display)
	Observe/Collect Method:	Captive
	Procedure:	Other
	Transport:	N/A
	Begin Date:	08/27/2020
	End Date:	08/31/2021
	Details:	Study 6. Other = Sample, swab. Skin swabs for microbiome: 2x per week x 50 weeks = 100 samples/whale/year (100 takes/whale/year).

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*	**Line Number:**	7
	Species:	Whale, beluga
	Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
	Production/Origin:	Captive
	Lifestage:	Adult/ Juvenile
	Sex:	Male and Female
	Expected Take:	5
	Actual Take:	5
	Indirect Mortality:	
	Actual Indirect Mortality:	
	Take Action:	Captive animals (research, enhancement, public display)
	Observe/Collect Method:	Captive
	Procedure:	Sample, blowhole swab
	Transport:	N/A
	Begin Date:	08/27/2020
	End Date:	08/31/2021
	Details:	Study 6. Blowhole swabs for microbiome: 2x per week x 50 weeks = 100 samples/whale/year (100 takes/whale/year).

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*	**Line Number:**	8
	Species:	Whale, beluga
	Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
	Production/Origin:	Captive
	Lifestage:	Adult/ Juvenile
	Sex:	Male and Female
	Expected Take:	5

Actual Take:	4
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Sample, anal swab
Transport:	N/A
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Study 6. Anal swabs for microbiome: 2x per week x 50 weeks = 100 samples/whale/year (100 takes/whale/year).

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*	**Line Number:**	9
	Species:	Whale, beluga
	Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
	Production/Origin:	Captive
	Lifestage:	Adult/ Juvenile
	Sex:	Male and Female
	Expected Take:	5
	Actual Take:	5
	Indirect Mortality:	
	Actual Indirect Mortality:	
	Take Action:	Captive animals (research, enhancement, public display)
	Observe/Collect Method:	Captive
	Procedure:	Other
	Transport:	N/A
	Begin Date:	08/27/2020
	End Date:	08/31/2021
	Details:	Study 6. Other = Oral swab. Oral swabs for microbiome: 2x per week x 50 weeks = 100 samples/whale/year (100 takes/whale/year).

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*	**Line Number:**	10
	Species:	Whale, beluga
	Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
	Production/Origin:	Captive
	Lifestage:	Adult/ Juvenile
	Sex:	Female

Expected Take:	4
Actual Take:	0
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Other
Transport:	N/A
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Study 6. Other = vaginal swab. Vaginal swabs for microbiome: 2x per week x 50 weeks = 100 samples/female whale/year (100 takes/whale/year).

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* **Line Number:**	11
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive
Lifestage:	Adult/ Juvenile
Sex:	Male and Female
Expected Take:	5
Actual Take:	0
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Photogrammetry
Transport:	N/A
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Study 4. Photogrammetry: 30 photographs/month x 12 months/year = 360 takes/whale/year.

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* **Line Number:**	12
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive

Lifestage:	Adult/ Juvenile
Sex:	Male and Female
Expected Take:	5
Actual Take:	0
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Measure
Transport:	N/A
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Study 4. Morphometric measurements: 1 set of measurements/month x 12 months = 12 takes/whale/year.

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* **Line Number:**	13
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive
Lifestage:	Adult/ Juvenile
Sex:	Male and Female
Expected Take:	5
Actual Take:	0
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Weigh
Transport:	N/A
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Study 4. Weights: 4 weights per year = 4 takes/whale/year.

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* **Line Number:**	14
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive

Lifestage:	Adult/ Juvenile
Sex:	Male and Female
Expected Take:	5
Actual Take:	0
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Instrument, suction-cup
Transport:	N/A
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Study 8. Testing suction-cups for animal borne imaging (ABI) systems and tags: 3 sessions per week x 50 weeks = 150 takes/ whale/year.

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*	**Line Number:**	15
	Species:	Whale, beluga
	Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
	Production/Origin:	Captive
	Lifestage:	Adult/ Juvenile
	Sex:	Male and Female
	Expected Take:	5
	Actual Take:	0
	Indirect Mortality:	
	Actual Indirect Mortality:	
	Take Action:	Captive animals (research, enhancement, public display)
	Observe/Collect Method:	Captive
	Procedure:	Auditory brainstem response test
	Transport:	N/A
	Begin Date:	08/27/2020
	End Date:	08/31/2021
	Details:	Study 3. Hearing and physiological response to anthropogenic sound. See Appendix 1, Table 2 of the permit for details.

Location

Research Area: Captivity
Location Description: Importation (from Marineland of Canada to Mystic Aquarium) and captive maintenance of five beluga whales for over the duration of the permit. See Appendix 1, Table 1 of the permit for details.

Take Information

*	**Line Number:**	1 **Version:** A
	Species:	Whale, beluga
	Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
	Production/Origin:	Captive
	Lifestage:	Adult/ Juvenile
	Sex:	Female
	Expected Take:	1
	Actual Take:	1
	Indirect Mortality:	
	Actual Indirect Mortality:	
	Take Action:	Captive animals (research, enhancement, public display)
	Observe/Collect Method:	Captive
	Procedure:	Captive, maintain; Import; Transport
	Transport:	1;2
	Begin Date:	08/27/2020
	End Date:	08/31/2021
	Details:	Jetta/NOA0010684. Captive-born at Marineland 7/17/14; Offspring of dam Skyla (wild capture, Sea of Okhotsk, Russia); potential sires: Andre (wild capture, Barents or White Sea, Russia), Kodiak, Orion, or Tuktoyaktuk (wild capture, Sea of Okhotsk, Russia).

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*	**Line Number:**	2 **Version:** A
	Species:	Whale, beluga
	Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
	Production/Origin:	Captive
	Lifestage:	Adult/ Juvenile
	Sex:	Male
	Expected Take:	1
	Actual Take:	1
	Indirect Mortality:	

Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Captive, maintain; Import; Transport
Transport:	1;2
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Havok/NOA0010685. Captive-born at Marineland 8/10/15; Offspring of dam Secord (wild capture, Sea of Okhotsk, Russia); potential sires: Tuktoyaktuk or Orion (wild capture, Sea of Okhotsk, Russia).

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* **Line Number:**	3
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive
Lifestage:	Adult/ Juvenile
Sex:	Female
Expected Take:	1
Actual Take:	1
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Captive, maintain; Import; Transport
Transport:	1;2
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Havana/NOA0010675. Captive-born at Marineland 7/23/15; Offspring of dam Kelowna (wild capture, Sea of Okhotsk, Russia); sire Andre (wild capture, Barents or White Sea, Russia).

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* **Line Number:**	4
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive
Lifestage:	Adult/ Juvenile
Sex:	Female

Expected Take:	1
Actual Take:	1
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Captive, maintain; Import; Transport
Transport:	1;2
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Kharabali/NOA0010671. Captive-born at Marineland 07/20/14; Offspring of dam Aurora (wild capture, Sea of Okhotsk, Russia); sire Kodiak (wild capture, Sea of Okhotsk, Russia).

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* **Line Number:**	5 **Version:** A
Species:	Whale, beluga
Listing Unit/Stock:	Sakhalin Bay-Nikolaya Bay-Amur River Stock
Production/Origin:	Captive
Lifestage:	Adult/ Juvenile
Sex:	Female
Expected Take:	1
Actual Take:	1
Indirect Mortality:	
Actual Indirect Mortality:	
Take Action:	Captive animals (research, enhancement, public display)
Observe/Collect Method:	Captive
Procedure:	Captive, maintain; Import; Transport
Transport:	1;2
Begin Date:	08/27/2020
End Date:	08/31/2021
Details:	Sahara/NOA0010683. Captive-born at Marineland 07/23/14; Offspring of dam Acadia (wild capture, Sea of Okhotsk, Russia); potential sires: Andre (wild capture, Barents or White Sea, Russia), Kodiak or Orion (wild capture, Sea of Okhotsk, Russia).

Transport Information

1.

Mode(s) of Transportation:	Transport #1 (Importation from Marineland of Canada to Mystic Aquarium). See attached Final Application.
Transportation Company:	See attached Final Application.
Maximum amount of time between capture and arrival:	See attached Final Application.
Container Description:	See attached Final Application.
Special Care:	See attached Final Application.
Accompanying Personnel Qualifications:	See attached Final Application.
Facility Title:	Mystic Aquarium
Facility Affiliation/Organization:	
Address:	55 Coogan Blvd Mystic, CT 06355 UNITED STATES
Phone Number:	(860)572-5955 ext.
Containment Method:	See attached Final Application.
Final Disposition:	See attached Final Application.

2.

Mode(s) of Transportation:	Transport #2 (Potential transport from Mystic Aquarium to Georgia Aquarium). See attached Final Application.
Transportation Company:	See attached Final Application.
Maximum amount of time between capture and arrival:	See attached Final Application.
Container Description:	See attached Final Application.
Special Care:	See attached Final Application.
Accompanying Personnel Qualifications:	See attached Final Application.
Facility Title:	Georgia Aquarium
Facility Affiliation/Organization:	
Address:	225 Bakers Street NW Atlanta, GA UNITED STATES

Phone Number:

Containment Method: See attached Final Application.

Final Disposition: See attached Final Application.

Project Contacts

Responsible Party: Stephen Coan

Primary Contact: Gayle Sirpenski

Principal Investigator: Tracy Romano

Other Personnel

Name	Role(s)
Manuel Castellote	Co-Investigator
Maureen Driscoll	Co-Investigator
Jennifer G Flower	Co-Investigator
Greg Marshall	Co-Investigator
Aran Mooney	Co-Investigator
Laura G Thompson	Co-Investigator
Allison Tuttle	Co-Investigator
Ebru G Unal	Co-Investigator

Summary

1. What progress did you make toward meeting your objectives this year? Summarize what you did and if and how you met your objectives. List citations for any reports, publications, and presentations from this reporting period. We may request electronic copies.
[NOTE: The following responses to questions in this report contain information Mystic Aquarium believes is protected from production to third parties under the Freedom of Information Act (FOIA)– please contact Mystic Aquarium if a FOIA request is received.]

LOCATION 1
Five captive born beluga whales were transported from Marineland of Canada, Inc. (Niagara Falls, Ontario, Canada) to Mystic Aquarium (Mystic, Connecticut) May 14-15, 2021, pursuant to MMPA Section 104 for scientific research. A breeding prevention plan was implemented through the separation of target and non-target animals from May 15 to June 18, 2021. From June 18 to June 24, 2021, target and non-target animals were mixed with access to all areas of the Arctic Coast habitat. On June 24, 2021, the non-target adult male had an erection while following target animals around the habitat prompting the separation of target and non-target animals through the end of breeding season.

Progress has been made for the following three research studies: Study 1- (Neuroimmunological Response to Environmental and Anthropogenic Stressors); Study 2- (Development of novel non-invasive techniques to assess health in free-ranging, stranded and endangered belugas); and Study 6- (Microbiome).

Study 1- Neuroimmunological Response to Environmental and Anthropogenic Stressors

The transport of the five whales from Marineland of Canada, Inc. to Mystic Aquarium, predicted to elicit a physiological response, allowed for the opportunity to collect blood samples pre-transport and upon arrival at Mystic Aquarium.

Whales were not trained for long duration blood layouts, which made getting the amount of blood needed challenging. It was also challenging accessing the whales in order to take blood samples pre-transport at Marineland. Various amounts of blood were obtained pre-transport for all five whales. Whales also had blood drawn upon arrival at Mystic Aquarium in the transport stretcher before introduction to the habitat. Although blood was to be sampled post transport from the whales, their behavior didn't allow for even a short duration blood draw for research purposes.

All blood samples were processed and archived until subsequent analyses. To date archived blood samples have been analyzed for immune function including a) lymphocyte proliferation and b) quantification of lymphocyte subsets for pre-transport and upon arrival at Mystic Aquarium. However, there wasn't enough blood for pre-transport assessment of lymphocyte subsets as well as pre-transport lymphocyte proliferation for two of the whales.

Lymphocyte Proliferation

Sahara, Jetta and Kharabali each had enough blood to examine T lymphocyte proliferation pre vs. post transport. Stimulation Indices for pre-transport at the optimal concentration of mitogen (to stimulate T cells) ranged from (b)(4), while arrival samples ranged from (b)(4). Arrival samples only were available for Havana and Havok showing a stimulation index of (b)(4). Post transport blood samples within the 48 hours following transport could not be obtained due to lack of voluntary participation from the whales and lack of training.

a) Quantification of Lymphocyte Subsets

Only arrival samples were available to investigate lymphocyte subsets including MHC II+, T cells, T helper cells, B cells and T/B cell ratios for each whale. Ranges of MHC II+ cells were (b)(4) cells; for T cells (b)(4); for T helper cells (b)(4); for B cells (b)(4); and (b)(4) for T/B cell ratios. Post transport blood samples within the 48 hours following transport could not be obtained due to lack of voluntary participation from the whales and lack of training.

Study 2- Development of novel non-invasive techniques to assess health in free-ranging, stranded and endangered belugas

The transport of the five whales from Marineland of Canada, Inc. to Mystic Aquarium, predicted to elicit a physiological response, allowed for the opportunity to collect saliva, blow and blood samples pre-transport and upon arrival at Mystic Aquarium. Blood samples obtained are described above and were processed and archived for study 2 in addition to study 1.

Blow

Whales had not been trained for blow collection at Marineland as we had originally anticipated or at least not to the training expectations for adequate blow sample collection. Pre-transport samples were collected but consisted of one breath each. Blow was collected opportunistically from the five whales in the transport stretcher before transport, upon arrival at Groton Airport and in the stretcher upon arrival at Mystic Aquarium by attaching the collecting device (petri dish with nylon membrane) to a bike reflector pole and holding it above the blowhole until 2-3 exhales were collected. Samples were also collected for molecular analysis by holding two conical tubes above the blowhole.

Once at Mystic Aquarium, training for blow collection was prioritized and whales were making good progress. Some samples were collected during the training process. All blow samples were processed for archiving until assay validation has been completed.

Saliva

Saliva was collected behaviorally at Marineland, although whales would break from the behavior frequently. Saliva was also collected at different time points post transport. Once at Mystic Aquarium, trainers were able to continue to work with whales on behavioral saliva collection and collected saliva during sessions as feasible. All saliva samples were processed and archived for

analyses after validation of assay.
Study 6- Microbiome
Swabs for microbiome were collected from whales at various body sites (not all sites for every whale) at Marineland. At Mystic Aquarium microbiome swabbing primarily focused on the mouth (since whales had open mouth behavior for saliva) and skin on the melon (since the head was out of the water). Training needs to occur for the whales to behaviorally receive or layout for blowhole, rectal and skin on either side of the dorsal ridge towards this study. For each collection of biological samples, water samples were also collected in the habitat at Marineland and at Mystic Aquarium.
Necropsy and Health Assessment
In addition to progress on the above, samples for research were taken from Havok's necropsy including blood, microbiome swabs and a series of tissues including major internal organs. Tissues were both flash frozen and preserved in RNAlater.
Research sampling has been on hold since necropsy on August 6, 2021.
Lymphocyte proliferation and quantification of lymphocyte subsets were also analyzed for health assessment on two whales whose behavior was off or became ill, in addition to routine clinical tests.

LOCATION 2
Five captive born beluga whales were transported from Marineland of Canada, Inc. (Niagara Falls, Ontario, Canada) to Mystic Aquarium (Mystic, Connecticut) May 14-15, 2021, pursuant to MMPA Section 104 for scientific research. A breeding prevention plan was implemented through the separation of target and non-target animals from May 15 to June 18, 2021. From June 18 to June 24, 2021, target and non-target animals were mixed with access to all areas of the Arctic Coast habitat. On June 24, 2021, the non-target adult male had an erection while following target animals around the habitat prompting the separation of target and non-target animals through the end of breeding season.

Research sampling surrounding the transport is described above.

2. Summarize how animals reacted to specific procedures.

Include normal and abnormal responses of target and non-target animals. Where possible, provide quantitative data and estimate the proportion of animals (%) that had those reactions.
LOCATION 1
All target and non-target animals had normal responses to voluntary attempts at research sampling 100% of the time. Some target animals had normal behavioral breakdown after transport resulting in delayed participation in sampling, however, no abnormal responses were noted.

Havana NOA0010675-100% normal response to behaviors to support Studies 1, 2 and 6.
Havana was participating in the following behaviors: saliva collection, oral swab, skin swab, dorsal layouts towards this sampling and blood collection.

Havok NOA0010685-100% normal response to behaviors to support Studies 2, and 6
Havok was participating in the following behaviors: saliva collection, oral swab, skin swab and dorsal layouts.

Jetta NOA0010684-100% normal response to behaviors to support Studies 1, 2 and 6.

Jetta was participating in the following behaviors: saliva collection, oral swab, skin swab, dorsal layouts and blood collection.

Kharabali NOA0010671-100% normal response to behaviors to support Studies 1, 2 and 6.
Kharabali was participating in the following behaviors: saliva collection, oral swab, skin swab, dorsal layouts and blood collection.

Sahara NOA0010683-100% normal response to behaviors to support Studies 1, 2 and 6.
Sahara was participating in the following behaviors: saliva collection, oral swab, skin swab, dorsal layouts and blood collection.

All target and non-target animals had normal responses to husbandry and health assessments 100% of the time.

Havok NOA0010685-100% normal response
Havana NOA0010675-100% normal response
Jetta NOA0010684-100% normal response
Kharabali NOA0010671-100% normal response
Sahara NOA0010683-100% normal response

All target and non-target animals had normal responses to medical treatments 100% of the time.

Havok NOA0010685-100% normal response
Havana NOA0010675-100% normal response
Jetta NOA0010684-100% normal response
Kharabali NOA0010671-100% normal response
Sahara NOA0010683-100% normal response

All target and non-target animals had normal responses to incidental public display 100% of the time.

Havok NOA0010685-100% normal response
Havana NOA0010675-100% normal response
Jetta NOA0010684-100% normal response
Kharabali NOA0010671-100% normal response
Sahara NOA0010683-100% normal response

LOCATION 2
Transport: Handling and Loading into Cradles, ride in cradles, loading into airplane
In Canada: Animals were individually handled in low water pools and placed into stretchers. No adverse, nor unexpected reactions were noted with any of the 5 animals during this process. Each animal was lifted from the pool via crane and placed into specially designed transport units, each lined with close cell foam, pool liner, and 24” of water for land and air transport. Each stretcher hung from cross beams which allowed animals to be partially submerged in water, but blow holes remained above water. This kept the animals wet, took weight off their body, and kept them safe during transit. During the land and air transport the animals were attended by staff.
Summary of each animal:
• Havana, NOA0010675 – observed moving slightly while in cradle/stretcher, respiration rate was slightly elevated during transit but returned to normal as soon as she was released into the Arctic Coast habitat.

• Havok, NOA0010685 – observed moving moderately while in cradle/stretcher, respiration rate varied between normal and slightly higher during transit and returned to normal as soon as he was released into the Arctic Coast habitat.
• Jetta, NOA0010684 – observed moving moderately while in cradle/stretcher, respiration rate was slightly elevated during transit but returned to normal as soon as she was released into the Arctic Coast habitat.
• Kharabali, NOA0010671– observed with very little movement while in cradle/stretcher, respiration rate was slightly elevated at beginning of transport and normalized during transport and when released into the Arctic Coast habitat.
• Sahara, NOA0010683 – observed moving moderately while in cradle/stretcher, respiration rate was slightly elevated at beginning of transport and normalized during transport and when released into the Arctic Coast habitat.

3. Explain your efforts to conduct follow-up monitoring. Report your findings. Photographs are useful to document things like wound healing.

We are especially interested in:

- **Animal responses to new/novel procedures**
- **Time it takes to resume normal in-water behavior after harassment**
- **Time it takes to re-populate rookeries or haul outs after harassment**
- **Condition of animals when resighted or recaptured**
- **Recovery from sedation and handling and post-release behavior**
- **Healing at site of intrusive sampling (e.g., biopsy)**
- **Healing at site of intrusive tag deployment (e.g., surgical tag implants requiring sutures, remotely deployed dart/barb, deep-implant, medial ridge, and pygal tags)**
- **Tag retention and tag breakage (i.e. is the tag still attached and what condition is the tag in?)**

LOCATION 1
Target animals had normal responses to new/novel procedures including recovery of behavioral training and implementation of new training processes 100% of the time.
Havok NOA0010685-100% normal response
Havana NOA0010675-100% normal response
Jetta NOA0010684-100% normal response
Kharabali NOA0010671-100% normal response
Sahara NOA0010683-100% normal response
Target animals had normal recovery of in-water behavior after behavioral sampling for research, husbandry training/assessments, and/or medical treatment 100% of the time.
Havok NOA0010685-100% normal response
Havana NOA0010675-100% normal response
Jetta NOA0010684-100% normal response
Kharabali NOA0010671-100% normal response
Sahara NOA0010683-100% normal response

LOCATION 2
Target animals had normal recovery from sedation and handling and post-release behavior after the transport.
Havok NOA0010685-100% normal response

Havana NOA0010675-100% normal response
Jetta NOA0010684-100% normal response
Kharabali NOA0010671-100% normal response
Sahara NOA0010683-100% normal response

4. Did serious injuries or mortalities occur or did you take a protected species you were not permitted to take? If so, and you already submitted an incident report, please briefly describe the event here and refer to the incident report.

If such an incident occurred and you have not yet reported it, provide a full description of the incident (date and location of event; species and circumstances of how the take occurred; photographs; necropsy and histopathology reports, or other information to confirm cause of death or extent of injuries; etc.). Also, include steps that were or will be taken to reduce the possibility of it happening again.

LOCATION 1

Please refer to the Incident Report submitted on 8/17/2021 for information on the mortality of the male beluga. No other serious injuries occurred during this reporting period.

LOCATION 2

No serious injuries occurred during the handling of the animals for transport to Mystic Aquarium

5. Describe any other problems encountered during this reporting period and steps taken or proposed to resolve them. Examples include equipment failure, weather delays, safety issues, and unanticipated effects to habitats or other species.

LOCATION 1

Target animals had anticipated behavioral recovery times for research/husbandry training when variables in their environment would change. Some of these variables included introduction to non-target animals and being separated from other target animals for medical assessments. Animals' behavior would be affected resulting in delayed response to trainers for a few sessions prompting trainers to pause training until behavior improved. These pauses would generally last 1-2 sessions after an environmental change.

Research sampling has been on hold since necropsy on August 6, 2021.

LOCATION 2

Overall, the transport went off with very few challenges. Summary of challenges in Canada:

• Initial road travel plan (route) to Hamilton Airport was changed the evening prior due to an unexpected detour on the planned route. Canadian police were monitoring all events on road travel and alerted the Canadian team, so the route was adjusted with advance notice.

• Rollers on the C-130 to put the cradles on the plane, moved slower than anticipated, so, it took longer to load the 1st three animals. Resulted in a delayed takeoff than originally planned.

• The Pandemic posed numerous challenges for collecting and processing research samples in Canada. Marineland had no infrastructure for processing and archiving samples. Although a back-up plan was put in place to take the samples to a laboratory at the University of Guelph (one hour from Marineland) for processing and archiving, Mystic Aquarium Research personnel were only allowed to travel from the airport to Marineland and vice versa due to Pandemic restrictions. Moreover, we were under the impression the whales had been trained for saliva, blood and blow

but quickly came to realize there was a discrepancy with our training standards vs. what Marineland personnel considered trained behaviors. The whales were also difficult to access for sampling at Marineland.

6. What efforts did you make to coordinate with the applicable NMFS Regional Office(s) and collaborate with other researchers? How did you collaborate (for example, avoiding field work at the same time or working together on the same animals, sharing vessels, sharing data)?

LOCATION 1

A collaboration was set up with a colleague from the University of Guelph (1 hour away) to help with equipment and supplies for proper sample collection, processing and archive of pre-transport samples since the infrastructure was non-existent at Marineland.

At Mystic Aquarium, no external collaborations have occurred at this point in time given the need for training the whales as the first primary objective for all the research studies.

LOCATION 2

Mystic coordinated with NMFS by obtaining a minor permit amendment a few days before transport, to change the arrival airport from Hartford, CT to Groton, CT.

A collaboration was set up with a colleague from the University of Guelph to help with equipment and supplies for proper sample collection, processing and archive of pre-transport samples since the infrastructure was non-existent at Marineland.

2 files attached.

Attachments

Application Archive - (Added Nov 30, 2021)
Report - (Added Nov 30, 2021)
Report - (Added Nov 30, 2021)

Addendum Permit #22629

Annual Permit Report 11/31/2021

HAVANA **NOA0010675**

Date Presribed	Reason	Treatment
16-Aug-21	Gastroprotectant	Sucralfate
14-Aug-21	Blepharospasm OD	Tramadol
29-Jul-21	Keratopathy	Doxycycline
20-Jul-21	Inflammatory hemogram	Cefpodoxime
10-Jun-21	Inflammatroy hemogram	Ciprofloxacin
27-May-21	Inflammatory hemogram	Clavamox
27-May-21	Inflammatory hemogram	Itraconazole
15-May-21	Gastroprotectant	Sucralfate
15-May-21	Gastroprotectant	Omeprazole
15-May-21	Supplement	Yunnan Baiyao supplement

HAVOK **NOA0010685**

Date Presribed	Reason	Treatment
04-Aug-21	Inflammatory hemogram	Cefpodoxime
04-Aug-21	Muscle relaxation	Methocarbamol
03-Aug-21	GI gas	Simethicone
02-Aug-21	Inflammatory hemogram	Clindamycin
31-Jul-21	Inflammatory hemogram	Itraconazole
28-Jul-21	Probiotic	Vetrimega Probiotic
28-Jul-21	Gastritis	Metronidazole
24-Jul-21	Gastritis	Barium sulfate oral suspension
23-Jul-21	Leukocytosis	Ciprofloxacin
19-Jul-21	Anti-fungal while on antibiotic therapy	Nystatin
16-Jul-21	Inflammatory hemogram.	Clindamycin
15-Jul-21	Liver Supplement	Milk Thistle
15-Jul-21	Wound care	Silver Sulfadiazine (SSD) + ILEX
15-Jul-21	Antibiotic	Azithromycin
14-Jul-21	Vitamin supplementation	Vitamin B Complex
14-Jul-21	Vitamin C supplementation for immune compromise	Vitamin C
14-Jul-21	Antibiotic	Azithromycin
13-Jul-21	Vitamin supplementation	Vitamin E/Selenium
12-Jul-21	Antibiotic	Ceftiofur Crystalline Free Acid
08-Jul-21	Poor appetitie	Diazepam
08-Jul-21	Gastritis	Misoprostol
06-Jul-21	Gastritis	Sucralfate
01-Jul-21	Gastritis	Barium sulfate oral suspension

01-Jul-21	Gastritis	Sucralfate liquid
30-Jun-21	Gastritis	Sucralfate
06-Jun-21	To prevent solar dermatitis	Bullfrog Quik Gel Sun Block (SPF 50)
04-Jun-21	Stromal abscess OS	Ciprofloxacin
04-Jun-21	Stromal abscess	Doxycycline
04-Jun-21	Stromal abscess OS	Tobramycin Opth Solution
01-Jun-21	Ocular discomfort	Tramadol
01-Jun-21	Inflammatory hemogram	Clavamox
01-Jun-21	Inflammatory hemogram	Itraconazole
26-May-21	Gastritis	Sucralfate liquid
18-May-21	Anti-fungal while on antibiotic therapy	Nystatin
15-May-21	Gastroprotectant	Yunnan Baiyao supplement
15-May-21	Antibiotic therapy	Levofloxacin
15-May-21	Gastroprotectant	Sucralfate
15-May-21	Gastroprotectant	Omeprazole

KHARABALI **NOA0010671**

Date Presribed	Reason	Treatment
06-Jul-21	Inflammatory hemogram	Sucralfate
06-Jul-21	inflammatory hemogram	Clindamycin
24-Jun-21	Inflamamtory hemogram	Azithromycin
23-Jun-21	Inflammatory hemogram	Azithromycin
09-Jun-21	Inflammtory hemogram	Ciprofloxacin
09-Jun-21	inflammatory hemogram	Cefpodoxime
04-Jun-21	Inflammatory hemogram	Clavamox
25-May-21	Inflammatory hemogram	Itraconazole
21-May-21	Antibiotic therapy	Levofloxacin
15-May-21	Gastroprotectant	Yunnan Baiyao supplement
15-May-21	Gastroprotectant	Omeprazole
15-May-21	Gastroprotectant	Sucralfate

JETTA **NOA0010675**

Date Presribed	Reason	Treatment
31-Aug-21	Inflammatory hemogram	Enrofloxacin
27-Aug-21	Gastritis	Nystatin tablets
24-Aug-21	Inappetence	Prednisolone
24-Aug-21	Inappetence	Diazepam
24-Aug-21	Gastritis	Peptobismol
24-Aug-21	Gastritis	Amikacin
23-Aug-21	Anorexia	Ondansetron
22-Aug-21	Gastritis	Clindamycin
21-Aug-21	Inflammatory hemogram	Enrofloxacin
18-Aug-21	Gastritis	Misoprostol
14-Aug-21	Pneumonia	Amikacin
08-Aug-21	Inappetence	Diazepam

07-Aug-21	Antibiotic coverage during period of reduced appetite	Ceftiofur Crystalline Free Acid
06-Aug-21	Inflammatory hemogram	Cefpodoxime
31-Jul-21	inflammatroy hemogram/ possible gastritis	Sucralfate liquid
29-Jul-21	Inflamamtory hemogram/ possible gastritis	Sucralfate
29-Jul-21	inflammatory hemogram	Ciprofloxacin
11-Jun-21	Inflammatory hemogram	Azithromycin
10-Jun-21	Severe inflammation	Azithromycin
04-Jun-21	Inflammatory hemogram	Cefpodoxime
01-Jun-21	Gastritis	Sucralfate
28-May-21	Inflammatory hemorgram	Levofloxacin
27-May-21	Anemia, suspected gastritis	Barium Sulfate Suspension
26-May-21	Inflammatory hemogram	Itraconazole
26-May-21	Inflammatoy hemogram	Sucralfate liquid
26-May-21	Inflammatory hemorgram	Clavamox
15-May-21	Gastroprotectant	Yunnan Baiyao supplement
15-May-21	Gastroprotectant	Omeprazole
15-May-21	Gastroprotectant	Sucralfate

SAHARA **NOA0010683**

Date Presribed	Reason	Treatment
19-Jul-21	Gastritis	Sucralfate liquid
09-Jul-21	Nausea	Ondansetron
08-Jul-21	Gastroenteritis	Clindamycin
08-Jul-21	Gastritis	Misoprostol
06-Jul-21	Gastritis	Sucralfate
03-Jul-21	enteritis	Peptobismol
02-Jul-21	Anxiolytic	Diazepam
30-Jun-21	Anti-nausea; GI discomfort	Ondansetron
29-Jun-21	Gastritis	Metronidazole
28-Jun-21	Anorexia	Azithromycin
27-Jun-21	Anorexia	Azithromycin
01-Jun-21	Inflammatory hemogram	Ciprofloxacin
18-May-21	Anti-fungal	Itraconazole
15-May-21	Gastroprotectant	Omeprazole
15-May-21	Gastroprotectant	Sucralfate
15-May-21	Antibiotic therapy	Clavamox
15-May-21	Gas relief	Simethicone
15-May-21	Gastroprotectant	Yunnan Baiyao supplement
15-May-21	Gastroprotectant	Sucralfate

Addendum Permit #22629

Annual Permit Report 11/31/2021

RESEARCH SAMPLE TAKE	SAMPLE NUMBER	SAMPLE DATE	NAME	NOAA ID	SAMPLE TIME	NOTES
BLOOD	01	6-May-21	KHARABALI	NOA0010671	9:42 AM	Pre-transport
BLOOD	02	6-May-21	JETTA	NOA0010684	9:36 AM	Pre-transport
BLOOD	03	6-May-21	SAHARA	NOA0010683	9:48 AM	Pre-transport
BLOOD	04	11-May-21	SAHARA	NOA0010683	11:20 AM	Pre-transport
BLOOD	05	11-May-21	JETTA	NOA0010684	10:45 AM	Pre-transport
BLOOD	06	11-May-21	HAVANA	NOA0010675	10:45 AM	Pre-transport
BLOOD	07	11-May-21	KHARABALI	NOA0010671	11:15 AM	Pre-transport
BLOW	09	11-May-21	KHARABALI	NOA0010671	11:05 AM	Pre-transport
SALIVA	10	11-May-21	JETTA	NOA0010684	10:45 AM	Pre-transport
SALIVA	11	11-May-21	HAVANA	NOA0010675	10:40 AM	Pre-transport
BLOOD	08	12-May-21	HAVOK	NOA0010685	10:35 AM	Pre-transport
BLOW	16	12-May-21	KHARABALI	NOA0010671	11:30 AM	Pre-transport
BLOW	17	12-May-21	HAVANA	NOA0010675	11:30 AM	Pre-transport
BLOW	18	12-May-21	HAVOK	NOA0010685	10:40 AM	Pre-transport
BLOW	23	12-May-21	HAVOK	NOA0010685	3:05 PM	Pre-transport
BLOW	24	12-May-21	KHARABALI	NOA0010671	2:20 PM	Pre-transport
BLOW	25	12-May-21	JETTA	NOA0010684	11:30 AM	Pre-transport
BLOW	26	12-May-21	JETTA	NOA0010684	2:20 PM	Pre-transport
BLOW	27	12-May-21	HAVANA	NOA0010675	2:20 PM	Pre-transport
BLOW	28	12-May-21	HAVANA	NOA0010675	8:05 AM	Pre-transport

BLOW	46	12-May-21	KHARABALI	NOA0010671	8:05 AM	Pre-transport
MICROBIOME (swab)	19	12-May-21	KHARABALI	NOA0010671	11:15 AM	Pre-Transport - Blow
MICROBIOME (swab)	62	12-May-21	KHARABALI	NOA0010671	11:15 AM	Pre-Transport - Oral
MICROBIOME (swab)	20	12-May-21	JETTA	NOA0010684	11:15 AM	Pre-Transport - Blow
MICROBIOME (swab)	63	12-May-21	JETTA	NOA0010684	11:15 AM	Pre-Transport - Blowhole
MICROBIOME (swab)	70	12-May-21	JETTA	NOA0010684	11:15 AM	Pre-Transport - Oral
MICROBIOME (swab)	71	12-May-21	JETTA	NOA0010684	11:15 AM	Pre-Transport - Anal
MICROBIOME (swab)	21	12-May-21	SAHARA	NOA0010683	11:15 AM	Pre-Transport - Blowhole
MICROBIOME (swab)	73	12-May-21	SAHARA	NOA0010683	11:15 AM	Pre-Transport - Oral
MICROBIOME (swab)	74	12-May-21	HAVANA	NOA0010675	11:15 AM	Pre-Transport - Oral
MICROBIOME (swab)	22	12-May-21	HAVANA	NOA0010675	11:15 AM	Pre-Transport - Blowhole
MICROBIOME (swab)	84	12-May-21	HAVANA	NOA0010675	11:15 AM	Pre-Transport - Anal
MICROBIOME (swab)	22	12-May-21	SAHARA	NOA0010683	11:15 AM	Pre-Transport - Anal
MICROBIOME (swab)	77	14-May-21	JETTA	NOA0010684	10:30 AM	Pre-Transport - Skin
SALIVA	12	12-May-21	KHARABALI	NOA0010671	7:38 AM	Pre-Transport
SALIVA	13	12-May-21	HAVANA	NOA0010675	7:38 AM	Pre-Transport
SALIVA	14	12-May-21	SAHARA	NOA0010683	7:38 AM	Pre-Transport
SALIVA	15	12-May-21	HAVOK	NOA0010685	10:30 AM	Pre-Transport
BLOOD	32	14-May-21	JETTA	NOA0010684	9:10 PM	Arrival at Mystic Aquarium
BLOOD	33	14-May-21	HAVANA	NOA0010675	9:45 PM	Arrival at Mystic Aquarium
BLOOD	34	14-May-21	KHARABALI	NOA0010671	10:13 PM	Arrival at Mystic Aquarium
BLOW	29	14-May-21	JETTA	NOA0010684	6:12 PM	Arrival at Groton Airport
BLOW	30	14-May-21	HAVANA	NOA0010675	6:15 PM	Arrival at Groton Airport
BLOW	31	14-May-21	KHARABALI	NOA0010671	6:20 PM	Arrival at Groton Airport
BLOW	36	14-May-21	JETTA	NOA0010684	9:03 PM	Arrival at Mystic Aquarium
BLOW	37	14-May-21	HAVANA	NOA0010675	9:41 PM	Arrival at Mystic Aquarium
BLOW	38	14-May-21	KHARABALI	NOA0010671	10:09 PM	Arrival at Mystic Aquarium

BLOW	38	14-May-21	KHARABALI	NOA0010671	10:14 PM	Arrival at Mystic Aquarium
BLOW	75	14-May-21	JETTA	NOA0010684	9:00 AM	Pre-Transport
BLOW	76	14-May-21	JETTA	NOA0010684	10:30 AM	Pre-Transport
BLOW	78	14-May-21	HAVANA	NOA0010675	9:05 AM	Pre-Transport
BLOW	79	14-May-21	HAVANA	NOA0010675	10:35 AM	Pre-Transport
BLOW	81	14-May-21	KHARABALI	NOA0010671	8:30 AM	Pre-Transport
BLOW	82	14-May-21	KHARABALI	NOA0010671	10:45 AM	Pre-Transport
MICROBIOME (swab)	80	14-May-21	HAVANA	NOA0010675	10:30 AM	Pre-Transport - Skin
MICROBIOME (swab)	83	14-May-21	KHARABALI	NOA0010671	10:30 AM	Pre-Transport - Skin
MICROBIOME (swab)	57	15-May-21	SAHARA	NOA0010683	10:30 PM	24h post - Oral
SALIVA	35	14-May-21	HAVANA	NOA0010675	9:40 PM	Arrival at Mystic Aquarium
BLOOD	41	15-May-21	HAVOK	NOA0010685	4:12 AM	Arrival at Mystic Aquarium
BLOOD	43	15-May-21	SAHARA	NOA0010683	4:40 AM	Arrival at Mystic Aquarium
BLOW	39	15-May-21	SAHARA	NOA0010683	3:15 AM	Arrival at Groton Airport
BLOW	40	15-May-21	HAVOK	NOA0010685	4:10 AM	Arrival at Mystic Aquarium
BLOW	42	15-May-21	SAHARA	NOA0010683	4:37 AM	Arrival at Mystic Aquarium
MICROBIOME (swab)	58	15-May-21	KHARABALI	NOA0010671	10:30 PM	Pre-Transport - Skin
MICROBIOME (swab)	59	15-May-21	KHARABALI	NOA0010671	10:30 PM	Pre-Transport - Oral
MICROBIOME (swab)	60	15-May-21	SAHARA	NOA0010683	10:30 PM	24h post - Oral
MICROBIOME (swab)	61	15-May-21	SAHARA	NOA0010683	10:30 PM	24h post - Skin
MICROBIOME (swab)	115	15-Jun-21	HAVOK	NOA0010685	10:00 AM	Oral
SALIVA	44	15-May-21	HAVOK	NOA0010685	4:10 AM	Arrival at Mystic Aquarium
SALIVA	45	15-May-21	HAVANA	NOA0010675	1:20 AM	2 hour post
SALIVA	47	15-May-21	HAVANA	NOA0010675	3:18 AM	4 hour post
SALIVA	48	15-May-21	KHARABALI	NOA0010671	3:20 AM	4 hour post
SALIVA	49	15-May-21	KHARABALI	NOA0010671	5:45 AM	6 hour post
SALIVA	51	15-May-21	HAVANA	NOA0010675	5:44 AM	6 hour post

SALIVA	52	15-May-21	HAVANA	NOA0010675	11:30 AM	12 hour post
SALIVA	53	15-May-21	KHARABALI	NOA0010671	11:35 AM	12 hour post
SALIVA	54	15-May-21	KHARABALI	NOA0010671	9:45 AM	10 hour post
SALIVA	55	15-May-21	HAVANA	NOA0010675	9:40 AM	10 hour post
SALIVA	56	15-May-21	HAVANA	NOA0010675	5:50 PM	24 hour post
SALIVA	64	15-May-21	SAHARA	NOA0010683	10:30 PM	24 hour post
SALIVA	65	15-May-21	JETTA	NOA0010684	10:30 PM	24 hour post
SALIVA	66	15-May-21	KHARABALI	NOA0010671	10:30 PM	24 hour post
SALIVA	67	15-May-21	HAVANA	NOA0010675	10:30 PM	24 hour post
SALIVA	68	16-May-21	SAHARA	NOA0010683	5:24 AM	24 hour post
SALIVA	69	16-May-21	HAVANA	NOA0010675	5:20 AM	24 hour post
SALIVA	85	21-May-21	JETTA	NOA0010684	9:45 AM	Half swabs
SALIVA	86	21-May-21	HAVANA	NOA0010675	9:45 AM	Half swabs
SALIVA	87	21-May-21	KHARABALI	NOA0010671	9:45 AM	Half swabs
SALIVA	88	21-May-21	HAVOK	NOA0010685	9:45 AM	Half swabs
SALIVA	89	21-May-21	SAHARA	NOA0010683	9:45 AM	Half swabs
SALIVA	95	25-May-21	HAVANA	NOA0010675	10:00 AM	possible water contamination
SALIVA	96	25-May-21	SAHARA	NOA0010683	10:00 AM	
SALIVA	97	25-May-21	JETTA	NOA0010684	10:00 AM	
SALIVA	98	25-May-21	KHARABALI	NOA0010671	10:00 AM	
SALIVA	99	27-May-21	HAVANA	NOA0010675	10:00 AM	Half swabs
SALIVA	100	27-May-21	SAHARA	NOA0010683	10:00 AM	
SALIVA	101	27-May-21	KHARABALI	NOA0010671	10:00 AM	Half swabs
SALIVA	102	27-May-21	HAVOK	NOA0010685	10:00 AM	Half swabs
SALIVA	103	27-May-21	JETTA	NOA0010684	10:00 AM	
BLOOD	N/A	1-Jun-21	HAVOK	NOA0010685	7:45 AM	Health Assessment
BLOOD	N/A	7-Jun-21	HAVOK	NOA0010685	7:15 AM	Health Assessment

BLOOD	N/A	30-Jun-21	HAVOK	NOA0010685	7:00am	Health Assessment
BLOW	110	3-Jun-21	JETTA	NOA0010684	10:30 AM	2 exhales
SALIVA	107	3-Jun-21	HAVANA	NOA0010675	10:00 AM	Half swabs
SALIVA	108	3-Jun-21	KHARABALI	NOA0010671	10:00 AM	Half swabs
SALIVA	109	3-Jun-21	JETTA	NOA0010684	10:00 AM	Half swabs
BLOOD	N/A	14-Jul-21	HAVOK	NOA0010685	7:15	Health Assessment
BLOOD	N/A	1-Jul-21	HAVOK	NOA0010685	EARLY AM	Health Assessment
BLOOD	N/A	16-Jul-21	HAVOK	NOA0010685	EARLY AM	Health Assessment
BLOW	114	9-Jun-21	KHARABALI	NOA0010671	7:50 AM	2 exhales
MICROBIOME (swab)	116	15-Jun-21	HAVOK	NOA0010685	10:00 AM	Skin on melon
MICROBIOME (swab)	117	15-Jun-21	HAVANA	NOA0010675	10:00 AM	Oral
MICROBIOME (swab)	118	15-Jun-21	HAVANA	NOA0010675	10:00 AM	Skin on melon
MICROBIOME (swab)	119	15-Jun-21	JETTA	NOA0010684	10:00 AM	Oral
MICROBIOME (swab)	120	15-Jun-21	JETTA	NOA0010684	10:00 AM	Skin on melon
MICROBIOME (swab)	121	15-Jun-21	SAHARA	NOA0010683	10:00 AM	Oral
MICROBIOME (swab)	122	15-Jun-21	SAHARA	NOA0010683	10:00 AM	Skin on melon
MICROBIOME (swab)	123	15-Jun-21	KHARABALI	NOA0010671	10:00 AM	Oral
MICROBIOME (swab)	124	15-Jun-21	KHARABALI	NOA0010671	10:00 AM	Skin on melon
MICROBIOME (swab)	142	24-Jun-21	HAVOK	NOA0010685	10:00 AM	Oral
BLOW	130	17-Jun-21	JETTA	NOA0010684	3:30 PM	2 exhales
BLOW	131	17-Jun-21	HAVANA	NOA0010675	3:30 PM	2 exhales
BLOW	132	17-Jun-21	KHARABALI	NOA0010671	3:30 PM	2 exhales
SALIVA	125	17-Jun-21	JETTA	NOA0010684	3:30 PM	PRE INTRO INTO MAIN POOL
SALIVA	126	17-Jun-21	HAVOK	NOA0010685	3:30 PM	PRE INTRO INTO MAIN POOL

SALIVA	127	17-Jun-21	SAHARA	NOA0010683	3:30 PM	PRE INTRO INTO MAIN POOL
SALIVA	128	17-Jun-21	KHARABALI	NOA0010671	3:30 PM	PRE INTRO INTO MAIN POOL
SALIVA	129	17-Jun-21	HAVANA	NOA0010675	3:30 PM	PRE INTRO INTO MAIN POOL
SALIVA	136	18-Jun-21	HAVANA	NOA0010675	7:00 AM	PRE INTRO INTO MAIN POOL
SALIVA	137	18-Jun-21	SAHARA	NOA0010683	7:00 AM	PRE INTRO INTO MAIN POOL
SALIVA	138	18-Jun-21	HAVOK	NOA0010685	7:00 AM	PRE INTRO INTO MAIN POOL
SALIVA	139	18-Jun-21	JETTA	NOA0010684	7:00 AM	PRE INTRO INTO MAIN POOL
SALIVA	140	18-Jun-21	KHARABALI	NOA0010671	7:00 AM	PRE INTRO INTO MAIN POOL
MICROBIOME (swab)	143	24-Jun-21	HAVOK	NOA0010685	10:00 AM	Skin on melon
MICROBIOME (swab)	144	24-Jun-21	JETTA	NOA0010684	10:00 AM	Oral
MICROBIOME (swab)	145	24-Jun-21	JETTA	NOA0010684	10:00 AM	Skin on melon
MICROBIOME (swab)	146	24-Jun-21	KHARABALI	NOA0010671	10:00 AM	Oral
MICROBIOME (swab)	147	24-Jun-21	KHARABALI	NOA0010671	10:00 AM	Skin on melon
MICROBIOME (swab)	148	24-Jun-21	HAVANA	NOA0010675	10:00 AM	Oral
MICROBIOME (swab)	149	24-Jun-21	HAVANA	NOA0010675	10:00 AM	Skin on melon
MICROBIOME (swab)	164	15-Jul-21	JETTA	NOA0010684	10:00 AM	Oral
SALIVA	150	25-Jun-21	HAVOK	NOA0010685	11:45 AM	
SALIVA	151	25-Jun-21	HAVANA	NOA0010675	11:45 AM	
SALIVA	152	25-Jun-21	JETTA	NOA0010684	11:45 AM	
SALIVA	153	25-Jun-21	SAHARA	NOA0010683	11:45 AM	
SALIVA	154	25-Jun-21	KHARABALI	NOA0010671	11:45 AM	
BLOOD	N/A	19-Jul-21	HAVOK	NOA0010685	8:00 AM	Health Assessment
BLOOD	N/A	22-Jul-21	HAVOK	NOA0010685	7:30 AM	Health Assessment
BLOOD	N/A	27-Jul-21	HAVOK	NOA0010685	7:00 AM	Health Assessment

BLOOD	N/A	30-Jul-21	HAVOK	NOA0010685	7:35 AM	Health Assessment
BLOOD	N/A	9-Jun-21	KHARABALI	NOA0010671	7:50 AM	Health Assessment
BLOOD	N/A	1-Jun-21	SAHARA	NOA0010683	6:30 AM	Health Assessment
BLOOD	N/A	7-Jun-21	SAHARA	NOA0010683	7:15 AM	Health Assessment
BLOOD	N/A	27-Jun-21	SAHARA	NOA0010683	9:00 AM	Health Assessment
BLOW	162	8-Jul-21	HAVANA	NOA0010675	10:10 AM	3 exhales
BLOOD	N/A	29-Jun-21	SAHARA	NOA0010683	7:15 AM	Health Assessment
BLOW	163	14-Jul-21	HAVOK	NOA0010685	7:15	3 exhales
MICROBIOME (swab)	165	15-Jul-21	JETTA	NOA0010684	10:00 AM	Skin on melon
MICROBIOME (swab)	166	15-Jul-21	SAHARA	NOA0010683	10:00 AM	Oral
MICROBIOME (swab)	167	15-Jul-21	SAHARA	NOA0010683	10:00 AM	Skin on melon
MICROBIOME (swab)	168	15-Jul-21	HAVANA	NOA0010675	10:00 AM	Oral
MICROBIOME (swab)	169	15-Jul-21	HAVANA	NOA0010675	10:00 AM	Skin on melon
MICROBIOME (swab)	170	15-Jul-21	KHARABALI	NOA0010671	10:00 AM	Oral
MICROBIOME (swab)	171	15-Jul-21	KHARABALI	NOA0010671	10:00 AM	Skin on melon
MICROBIOME (swab)	179	22-Jul-21	SAHARA	NOA0010683	10:00 AM	Oral
BLOOD	N/A	30-Jun-21	SAHARA	NOA0010683	7:00am	Health Assessment
BLOW	176	16-Jul-21	HAVANA	NOA0010675	10:00 AM	2 exhales
BLOW	178	16-Jul-21	JETTA	NOA0010684	10:00 AM	2 exhales
SALIVA	172	16-Jul-21	HAVOK	NOA0010685	9:45 AM	Half swabs
SALIVA	173	16-Jul-21	SAHARA	NOA0010683	9:45 AM	Half swabs
SALIVA	174	16-Jul-21	KHARABALI	NOA0010671	9:45 AM	Half swabs
SALIVA	175	16-Jul-21	HAVANA	NOA0010675	9:45 AM	Half swabs
SALIVA	177	16-Jul-21	JETTA	NOA0010684	9:45 AM	Half swabs

BLOOD	N/A	1-Jul-21	SAHARA	NOA0010683	EARLY AM	Health Assessment
BLOOD	N/A	5-Jul-21	SAHARA	NOA0010683	EARLY AM	Health Assessment
MICROBIOME (swab)	180	22-Jul-21	SAHARA	NOA0010683	10:00 AM	Skin on melon
MICROBIOME (swab)	181	22-Jul-21	KHARABALI	NOA0010671	10:00 AM	Oral
MICROBIOME (swab)	182	22-Jul-21	KHARABALI	NOA0010671	10:00 AM	Skin on melon
MICROBIOME (swab)	183	22-Jul-21	HAVANA	NOA0010675	10:00 AM	Oral
MICROBIOME (swab)	184	22-Jul-21	HAVANA	NOA0010675	10:00 AM	Skin on melon
MICROBIOME (swab)	185	22-Jul-21	HAVANA	NOA0010675	10:00 AM	Blow
MICROBIOME (swab)	186	22-Jul-21	JETTA	NOA0010684	10:00 AM	Oral
MICROBIOME (swab)	187	22-Jul-21	JETTA	NOA0010684	10:00 AM	Skin on melon
MICROBIOME (swab)	188	22-Jul-21	JETTA	NOA0010684	10:00 AM	Blow
MICROBIOME (swab)	189	22-Jul-21	HAVOK	NOA0010685	7:00 AM	Oral
MICROBIOME (swab)	190	22-Jul-21	HAVOK	NOA0010685	7:00 AM	Skin
MICROBIOME (swab)	191	22-Jul-21	HAVOK	NOA0010685	7:00 AM	Blowhole
MICROBIOME (swab)	192	27-Jul-21	HAVOK	NOA0010685	7:00 AM	Oral
BLOOD	N/A	6-Jul-21	SAHARA	NOA0010683	8:00 AM	Health Assessment
MICROBIOME (swab)	193	27-Jul-21	HAVOK	NOA0010685	7:00 AM	Skin
MICROBIOME (swab)	194	27-Jul-21	HAVOK	NOA0010685	7:00 AM	Blowhole
MICROBIOME (swab)	195	30-Jul-21	HAVOK	NOA0010685	7:00 AM	Oral
MICROBIOME (swab)	196	30-Jul-21	HAVOK	NOA0010685	7:00 AM	Skin
MICROBIOME (swab)	197	30-Jul-21	HAVOK	NOA0010685	7:00 AM	Blowhole
MICROBIOME (swab)	198	30-Jul-21	HAVOK	NOA0010685	7:00 AM	Anal
BLOW	202	3-Aug-21	HAVANA	NOA0010675	9:40 AM	2 exhales
BLOW	203	3-Aug-21	SAHARA	NOA0010683	9:40 AM	2 exhales

SALIVA	199	3-Aug-21	HAVANA	NOA0010675	10:00 AM	Half swabs
SALIVA	200	3-Aug-21	SAHARA	NOA0010683	10:00 AM	Half swabs
SALIVA	201	3-Aug-21	KHARABALI	NOA0010671	10:00 AM	Half swabs
BLOOD	N/A	6-Aug-21	HAVOK	NOA0010685	5:00pm	Necropsy
MICROBIOME (swab)	N/A	6-Aug-21	HAVOK	NOA0010685	5:00 PM	Necropsy
TISSUE - BRAIN	N/A	6-Aug-21	HAVOK	NOA0010685	3:00 PM	Necropsy
TISSUE - HEART	N/A	6-Aug-21	HAVOK	NOA0010685	3:35 PM	Necropsy
TISSUE - KIDNEY	N/A	6-Aug-21	HAVOK	NOA0010685	5:00 PM	Necropsy
TISSUE - LARGE INTEST	N/A	6-Aug-21	HAVOK	NOA0010685	5:00 PM	Necropsy
TISSUE - LIVER	N/A	6-Aug-21	HAVOK	NOA0010685	3:51 PM	Necropsy
TISSUE - LUNG	N/A	6-Aug-21	HAVOK	NOA0010685	3:35 PM	Necropsy
TISSUE - MESENTRIC LY	N/A	6-Aug-21	HAVOK	NOA0010685	4:15 PM	Necropsy
TISSUE - MUSCLE	N/A	6-Aug-21	HAVOK	NOA0010685	1:30 PM	Necropsy
TISSUE - PPAN	N/A	6-Aug-21	HAVOK	NOA0010685	5:00 PM	Necropsy
TISSUE - SKIN ANTERIO	N/A	6-Aug-21	HAVOK	NOA0010685	1:00 PM	Necropsy
TISSUE - SKIN ANTERIO	N/A	6-Aug-21	HAVOK	NOA0010685	1:00 PM	Necropsy
TISSUE - SKIN DORSAL F	N/A	6-Aug-21	HAVOK	NOA0010685	1:00 PM	Necropsy
TISSUE - SKIN DORSAL F	N/A	6-Aug-21	HAVOK	NOA0010685	1:00 PM	Necropsy
TISSUE - SKIN HEALTHY	N/A	6-Aug-21	HAVOK	NOA0010685	1:00 PM	Necropsy
TISSUE - SKIN LESION A	N/A	6-Aug-21	HAVOK	NOA0010685	1:00 PM	Necropsy
TISSUE - SKIN MID 1	N/A	6-Aug-21	HAVOK	NOA0010685	1:00 PM	Necropsy
TISSUE - SKIN MID 2	N/A	6-Aug-21	HAVOK	NOA0010685	1:00 PM	Necropsy
TISSUE - SKIN POSTERIC	N/A	6-Aug-21	HAVOK	NOA0010685	1:00 PM	Necropsy
TISSUE - SKIN POSTERIC	N/A	6-Aug-21	HAVOK	NOA0010685	1:00 PM	Necropsy

TISSUE - SMALL INTEST	N/A	6-Aug-21	HAVOK	NOA0010685	5:00 PM	Necropsy
TISSUE - SPINAL CORD	N/A	6-Aug-21	HAVOK	NOA0010685	3:20 PM	Necropsy
TISSUE - SPLEEN	N/A	6-Aug-21	HAVOK	NOA0010685	3:57 PM	Necropsy
TISSUE - TESTIS	N/A	6-Aug-21	HAVOK	NOA0010685	4:30 PM	Necropsy

HEALTH ASSESSMENT ONLY SAMPLE TAKE	SAMPLE DATE	NAME	NOAA ID
BLOOD	27-May-21	HAVANA	NOA0010675
BLOOD	03-Jun-21	HAVANA	NOA0010675
BLOOD	10-Jun-21	HAVANA	NOA0010675
BLOOD	15-Jun-21	HAVANA	NOA0010675
BLOOD	23-Jun-21	HAVANA	NOA0010675
BLOOD	01-Jul-21	HAVANA	NOA0010675
BLOOD	16-Jul-21	HAVANA	NOA0010675
BLOOD	20-Jul-21	HAVANA	NOA0010675
BLOOD	28-Jul-21	HAVANA	NOA0010675
BLOOD	04-Aug-21	HAVANA	NOA0010675
BLOOD	16-Aug-21	HAVANA	NOA0010675
BLOOD	23-Aug-21	HAVANA	NOA0010675
BLOOD	30-Aug-21	HAVANA	NOA0010675
BLOOD	26-May-21	JETTA	NOA0010684
BLOOD	28-May-21	JETTA	NOA0010684
BLOOD	04-Jun-21	JETTA	NOA0010684
BLOOD	08-Jun-21	JETTA	NOA0010684

BLOOD	09-Jun-21	JETTA	NOA0010684
BLOOD	16-Jun-21	JETTA	NOA0010684
BLOOD	28-Jun-21	JETTA	NOA0010684
BLOOD	07-Jul-21	JETTA	NOA0010684
BLOOD	20-Jul-21	JETTA	NOA0010684
BLOOD	29-Jul-21	JETTA	NOA0010684
BLOOD	31-Jul-21	JETTA	NOA0010684
BLOOD	2-Aug-21	JETTA	NOA0010684
BLOOD	6-Aug-21	JETTA	NOA0010684
BLOOD	7-Aug-21	JETTA	NOA0010684
BLOOD	10-Aug-21	JETTA	NOA0010684
BLOOD	12-Aug-21	JETTA	NOA0010684
BLOOD	14-Aug-21	JETTA	NOA0010684
BLOOD	16-Aug-21	JETTA	NOA0010684
BLOOD	19-Aug-21	JETTA	NOA0010684
BLOOD	19-Aug-21	JETTA	NOA0010684
BLOOD	21-Aug-21	JETTA	NOA0010684
BLOOD	24-Aug-21	JETTA	NOA0010684
BLOOD	25-Aug-21	JETTA	NOA0010684
BLOOD	26-Aug-21	JETTA	NOA0010684
BLOOD	27-Aug-21	JETTA	NOA0010684
BLOOD	28-Aug-21	JETTA	NOA0010684
BLOOD	31-Aug-21	JETTA	NOA0010684

BLOOD	04-Jun-21	KHARABALI	NOA0010671
BLOOD	22-Jun-21	KHARABALI	NOA0010671
BLOOD	22-Jun-21	KHARABALI	NOA0010671
BLOOD	28-Jun-21	KHARABALI	NOA0010671
BLOOD	05-Jul-21	KHARABALI	NOA0010671
BLOOD	22-Jul-21	KHARABALI	NOA0010671
BLOOD	04-Aug-21	KHARABALI	NOA0010671
BLOOD	12-Aug-21	KHARABALI	NOA0010671
BLOOD	23-Aug-21	KHARABALI	NOA0010671
BLOOD	30-Aug-21	KHARABALI	NOA0010671
BLOOD	26-May-21	SAHARA	NOA0010683
BLOOD	02-Jul-21	SAHARA	NOA0010684
BLOOD	08-Jul-21	SAHARA	NOA0010685
BLOOD	12-Jul-21	SAHARA	NOA0010686
BLOOD	7-Aug-21	SAHARA	NOA0010687
BLOOD	23-Aug-21	SAHARA	NOA0010688
BLOOD	12-Jul-21	HAVOK	NOA0010685
BLOOD	13-Jul-21	HAVOK	NOA0010685
BLOOD	15-Jul-21	HAVOK	NOA0010685
BLOOD	20-Jul-21	HAVOK	NOA0010685
BLOOD	3-Aug-21	HAVOK	NOA0010685
BLOOD	3-Aug-21	HAVOK	NOA0010685
BLOOD	4-Aug-21	HAVOK	NOA0010685

FECAL	23-Aug-21	JETTA	NOA0010684
FECAL	24-Aug-21	JETTA	NOA0010684
GASTRIC	7-Aug-21	JETTA	NOA0010685
GASTRIC	19-Aug-21	JETTA	NOA0010686
GASTRIC	19-Aug-21	JETTA	NOA0010687
GASTRIC	20-Aug-21	JETTA	NOA0010688
GASTRIC	23-Aug-21	JETTA	NOA0010689
GASTRIC	23-Aug-21	JETTA	NOA0010690
GASTRIC	25-Aug-21	JETTA	NOA0010691
GASTRIC	26-Aug-21	JETTA	NOA0010692
GASTRIC	9-Jun-21	KHARABALI	NOA0010671
GASTRIC	01-Jun-21	SAHARA	NOA0010683
GASTRIC	29-Jun-21	SAHARA	NOA0010683
GASTRIC	30-Jun-21	SAHARA	NOA0010683
GASTRIC	01-Jul-21	SAHARA	NOA0010683
GASTRIC	02-Jul-21	SAHARA	NOA0010683
GASTRIC	02-Jul-21	SAHARA	NOA0010683
GASTRIC	06-Jul-21	SAHARA	NOA0010683
GASTRIC	07-Jul-21	SAHARA	NOA0010683
GASTRIC	08-Jul-21	SAHARA	NOA0010683
GASTRIC	12-Jul-21	SAHARA	NOA0010683
GASTRIC	07-Aug-21	SAHARA	NOA0010683
GASTRIC	12-Aug-21	SAHARA	NOA0010683

URINE	30-Jun-21	SAHARA	NOA0010684
FECAL	30-Jun-21	SAHARA	NOA0010685
FECAL	1-Jul-21	SAHARA	NOA0010686
FECAL	30-Jun-21	SAHARA	NOA0010687
FECAL	30-Jun-21	SAHARA	NOA0010688
FECAL	5-Jul-21	SAHARA	NOA0010689
FECAL	7-Jul-21	SAHARA	NOA0010690