

**Submittal #01 57 19-9R2
Marine Mammal Monitoring Plan**

**Multi-Mission Expansion of Dry Dock 1
P-381
Year 2 (2023) – Year 6 (2028) LOA**

March 2023

**Presented To:
PNSY Public Works Department
Portsmouth Naval Shipyard Kittery, ME 03904**

By: 381 Constructors

Marine Mammal Monitoring Plan

Summary

This Marine Mammal Monitoring Plan (MMMP) has been developed to demonstrate compliance with the P-381 Project associated with the Multifunctional Expansion of Dry Dock 1, Specification Section 01 57 19.00 22 Subsection 1.7.1 (Item D) and in concurrence with information provided in the P-381 project Application for Letter of Authorization (LOA) (submitted by NAVFAC in August 2022). This document may be amended as necessary to comply with the requirements of the LOA. The P-381 LOA and supporting application will be in the Environmental Office on site.

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1. DESCRIPTION AND OVERVIEW

The MMMP is required to address activities associated with pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activities in the super flood basin and at Berths 1 and 11 for the P-381 Multi-mission Dry Dock 1 Project. This Plan covers the following as it relates to the Marine Mammal Protection Act (MMPA), the LOA and the project specifications issued to the Contractor:

- Mitigation Measures
- Description of Region of Influence (ROI)
- Shutdown, Level A and Level B harassment zones
- Monitoring Measures and Frequency
- Communication Plan and Procedures
- Data Collection and Reporting
- Protected Species Observer Qualifications
- Recordings of Incidental Harassment Takes
- Weekly/Monthly Review of Observations and Take Counts

2. MITIGATION MEASURES

The P-381 LOA authorizes the “taking” of five species of protected marine mammals in the Piscataqua River area surrounding the Project Area, consistent with previous authorizations for similar projects in this area. These species are:

- Harbor porpoise (*Phocoena phocoena*)
- Harbor seal (*Phoca vitulina*)
- Gray seal (*Halichoerus grypus*)
- Harp seal (*Pagophilus groenlandicus*)
- Hooded seal (*Cystophora cristata*)

Mitigation measures to reduce the overall “take” of marine mammals during construction activities are as follows:

Monitoring and management of the zones:

- a. Protected Species Observers (PSOs) will be stationed in positions as indicated in the application to adequately view the entire Region of Influence (ROI) for pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activities. The ROI is defined by the farthest extent of sound propagation from the project area (Figure 11-1, Section 4).
 - It is expected that three PSOs will be required to adequately observe the harassment zones during pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activities.
- b. PSOs will have no other assigned tasks during monitoring events (dedicated to monitoring).
- c. If weather conditions prevent PSOs from adequately viewing the shutdown zone for the activity that is occurring, activities will be curtailed until conditions improve. However, if an activity has already begun, work will continue until that item is installed or until it is safe to pause the activity,

or until an observation triggers a shutdown.

- d. The shutdown zone, harassment zones, and region of influence (ROI) will be visually observed in the field as appropriate to the modeled acoustic thresholds for the specific activity provided in the LOA Application (prepared August 2022).
- e. Applicable operations (pile driving [vibratory and impact] and extraction, rock hammering, DTH hammer operation, and rotary drilling activity) will not commence until a 30-minute pre-start clearance monitoring has been performed and it has been determined by the PSOs that the applicable activity shutdown zone is free of marine mammals in accordance with Table 11-1 from the LOA Application (Section 2 of this plan).
 - If a marine mammal is present or observed entering the shutdown zone during the pre-activity survey, work will be delayed until one of the following conditions has been met:
 - the animal has been observed exiting the shutdown zone;
 - the animal is thought to have exited the shutdown zone based on a determination of its course, speed, and movement relative to the pile driving location; or
 - the shutdown zone has been clear from any additional sightings for 15-minutes.
 - PSOs will communicate in accordance with the Communications Plan (Section 6) to the crew when pre-activity observation is complete and the zone is clear, or if work must be delayed.
- f. Operations will cease if a marine mammal is observed within or approaching the shutdown zone during pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activities. Activities will remain halted until the mammal is seen exiting the area by its own volition, the animal is determined to have exited the shutdown zone based on a determination of its course, speed, and movement relative to the activity location, or if there are no sightings of the animal in the shutdown zone for fifteen minutes. If in-water construction activities cease for more than 30 minutes, the pre-activity monitoring of the shutdown zone must commence.
- g. Crews will utilize a soft-start technique at the start of impact hammer pile driving activities, which will be noted in the In-Water Noise Generating Work Report (Attachment E) that are submitted at the end of every shift. The soft-start provides a warning and/or gives animals in close proximity to pile-driving a chance to leave the area prior to an impact driver operating at full capacity, thereby exposing fewer animals to loud underwater and airborne sounds. Soft starts are required at the start of the day and after a break in impact driving lasting 30 minutes or longer.
- h. Pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activities will occur during daylight hours only.
- i. The Contractor will notify the Navy when they have reached 70% take authorization for any species, if there is an unusual uptick in sightings for a particular species, or if a species for which there is no take authorization is observed.
- j. Acoustic monitoring will be performed in congruence with the P-381 LOA Application and the LOA. The Hydroacoustic Monitoring Plan has been updated for the P-381 LOA under separate cover.

3. DESCRIPTION OF ROI: SHUTDOWN, LEVEL A, AND LEVEL B ZONES

The Level A and Level B harassment zones were determined by the distances calculated in the P-381 LOA Application. The shutdown zones were determined during consultation with NMFS. To facilitate compliance with the LOA by the Contractor, the Contractor will implement shutdown zones as noted.

A. Shutdown Zone

The Navy, construction supervisors and crews, PSOs, and relevant Navy staff must avoid direct physical interaction with marine mammals during construction activity. If a marine mammal comes within 10 meters (33 ft) of construction activity, operations must cease and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions, as necessary to avoid direct physical interaction.

Visual monitoring will occur within the shutdown zone during all applicable activities. For some activities, the shutdown zone is larger than the Level A Harassment zone. For all other in water construction activities not listed in the LOA application, the shutdown zone will be ten meters.

To ensure compliance with the LOA, the Contractor will implement the shutdown zones found in Table 11-1 below, and as listed in the LOA, for all authorized noise generating activity. During concurrent activities, the largest shutdown zone will be implemented (i.e., 200-meters for HF cetaceans and 50-meters for pinnipeds). This blanket setting of the shutdown zones will encompass all concurrent noise generating activities and provide consistency for the PSOs during the construction process due to the number of anticipated concurrent activities.

If a shutdown is required, the activities will cease as soon as safely practicable.

B. Level A Harassment Zone

Considered the “injurious” zone – If a marine mammal is observed within this zone during pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling operations, activities will continue without cessation (unless this zone falls within the shutdown zone) and the PSOs will continue to monitor, document, and report the mammal’s activity as a Level A take.

Pile driving and drilling activity must be halted upon observation of either a species entering or within the harassment zone for which incidental take is not authorized, or a species for which incidental take has been authorized but the authorized number of takes has been met.

C. Level B Harassment Zone

Considered the “disturbance” zone – If a marine mammal is observed within this zone during noise generating activities covered by the LOA, activities will continue without cessation and PSOs will continue to monitor, document, and report the mammal’s activity as a Level B take.

Level A and Level B Zones are described within the P-381 LOA application in Table 11-1 (included below). Figures from the application showing the boundaries of the various harassment zones will be available in the field for PSOs.

Pile driving and drilling activity must be halted upon observation of either a species entering or within the harassment zone for which incidental take is not authorized, or a species for which incidental take has been authorized but the authorized number of takes has been met.

Table 11-1 Proposed Monitoring Area Distances by Activity and Marine Mammal

LOA Year	Activity, Size, And Component	Shutdown Zone		Level A (PTS Onset) Harassment (m)		Level B (Behavioral) Harassment ¹ (m)
		Harbor Porpoise	Seals	Harbor Porpoise	Seals	
2	Rock Hammering	200 ²	50 ²	ROI	ROI	NA ³
2	Impact Pile Driving – 4 sheet piles per day	200 ²	50 ²	988	444	ROI
2/3	Impact Pile Driving – 2 sheet piles per day	200 ²	50 ²	623	280	ROI
2/3	Vibratory Pile Driving/Extraction – 8 sheet piles per day	20	10	19.4	8	ROI
2	Vibratory Pile Driving/Extraction – 6 sheet piles per day	20	10	16	6.6	ROI
2	Vibratory Pile Driving/Extraction – 4 sheet piles per day	15	10	12.2	5	ROI
2/3	Vibratory Pile Driving/Extraction – 2 sheet piles per day	10	10	7.7	3.2	ROI
2	DTH mono-hammer 4-6 inch relief holes	180	50 ²	179	80	ROI
2/3/4/5	DTH mono-hammer 9-inch rock anchors for tie-downs	200 ²	50 ²	245	110	ROI
2/3/4	Rotary Drilling – 1 hour to set casings	10	10	2.1	1.3	ROI
2/3/4	Rotary drilling – 9 hours to drill socket	10	10	8.9	5.4	ROI
2/3/4	Rotary Drilling – 15 minutes to remove casings and temporary work trestle piles	10	10	0.8	0.5	ROI
2/3/4	Cluster Drilling	200 ²	50 ²	ROI	ROI	NA

Notes:

1. In instances where the harassment zone is larger than the ROI, the entire ROI is indicated as the limit of monitoring.
 2. Shutdown zone distance negotiated with NMFS for P-381 year 1 IHA (NMFS 2022).
 3. NA = Not Applicable because the entire ROI would be ensouified to the Level A threshold
- Bolded** activities will employ a bubble curtain to reduce underwater noise impacts outside of the basin (refer to Section 11.2.4).
Key: ROI = region of influence.

D. Bubble Curtain

The contractor shall operate a bubble curtain consistent with the design and performance standards described in LOA Application 11.2.4. The bubble curtain will be installed across the openings of the basin to help attenuate sound for the sound sources that encompass the entire ROI.

The bubble curtain may be discontinued for certain activities should the results of hydroacoustic recordings inside the bubble curtain show that the source levels from those activities do not result in the Level A harassment thresholds being achieved across the entire region of influence, upon review of the data by NMFS. The PSO will note when the bubble curtain is utilized during all cluster drill and hydraulic rock hammering activities.

4. MONITORING MEASURES AND FREQUENCY

Visual observation monitoring will be conducted in compliance with the P-381 LOA. This plan covers visual observational measures only; the Hydroacoustic Monitoring Plan will be submitted under separate cover. The hydroacoustic technician and PSOs will coordinate work in the field during applicable activities. Communication will be achieved via phone or radio.

Visual Marine Mammal Monitoring Observations

Sighting data and behavioral responses to construction activity will be collected during pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activity. Authorized species and corresponding number of authorized incidental takes can be found in Table 1 below. PSOs will conduct a pre- and post-activity survey 30- minutes before and 30-minutes after all monitored in-water construction activities. Three PSOs will be stationed to observe for marine mammals during pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activities.

Table 1. Authorized Incidental Take

Common Name	Scientific Name	Stock	Level A Harassment	Level B Harassment
Harbor porpoise	<i>Phocoena phocoena</i>	Gulf of Maine / Bay of Fundy	29	5
Harbor seal	<i>Phoca vitulina</i>	Western North Atlantic	2,018	4,260
Gray seal	<i>Halichoerus gryps</i>	Western North Atlantic	133	284
Hooded seal	<i>Cystophora cristata</i>	Western North Atlantic	25	25
Harp seal	<i>Pogophilus groenlandicus</i>	Western North Atlantic	25	25

A. Monitoring Within the Shutdown Zone

For 30 minutes before activity begins, during and 30 minutes after pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activities, PSOs will be stationed at three approved locations (wherever provides the best vantage point for the applicable event). The maximum shutdown zones from the LOA will be implemented during all pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activities.

The shutdown zone will be observed for 30-minutes prior to noise generating activities commencing. Work will not start until the PSO deems the shutdown zone clear of any marine mammals. In the event of a marine mammal sighting within this zone before activity begins, work will be delayed until it is determined that the animal(s) have left the area, in accordance with Section 3 (A) of this plan.

If, during these activities, a marine mammal is observed entering or is within the shutdown zone, work will cease as soon as it can be done so safely. Activity will not resume until the mammal is observed leaving the area of its own volition, if the animal is thought to have exited the shutdown zone based on a

determination of its course, speed, and movement relative to the activity location, or has not been observed in the zone for 15 minutes.

Observation of the shutdown zone will continue thirty minutes after activities have concluded.

PSOs will have direct contact with work crews via radio/phone to clearly communicate marine mammal sightings and the requirement to shut down operations if a mammal enters or approaches the shutdown zone.

B. Level A and Level B Harassment Zones

The Level A and Level B harassment zones will be monitored for marine mammal activity during pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activities. For all in-water construction activities, a three PSO team will be stationed at a pre-approved monitoring location sufficient to monitor the harassment and shutdown zones. If a marine mammal is observed within a harassment zone, but is not within the shutdown zone, work will continue without cessation and information on the animal will be recorded on the data sheet as a take of that specific species. Observation of the harassment zones will start 30 minutes prior to any pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling efforts and will continue 30 minutes after activities have finished.

C. Location and Timing of Monitoring

Monitoring will begin 30 minutes prior to initiation of work and continue until 30 minutes post activity to capture all exposed marine mammals. If weather conditions prevent PSOs from viewing the entire shutdown zone, pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activity will be curtailed, until observers are confident marine mammals within the shutdown zone could be detected. If an activity has already begun, work will continue until the activity can be halted safely. At least one PSO will be stationed on site at a vantage point to always see the entirety of the shutdown zone during pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling operations. Possible PSO viewing stations are the following possible vantage points (Figure 11-1 of the LOA Application):

- Portsmouth Naval Shipyard:
 - Berth 1
 - Berth 2
 - Berth 11
 - Berth 12
 - Boat within the project limits
- Four Tree Island
- Prescott Park
- Steamship Company
- Pierce Island
- Harbor Walk Park

Figure 11-1 Potential Vantage Points for Protected Species Observers



5. EQUIPMENT

PSOs will be equipped with the items listed below to enable them to report accurate data regarding marine mammal sightings and work activities being performed:

- Binocular
- Range finder
- Compass
- Tablet (to record observations using the Stantec developed monitoring app)
- Paper datasheets (as a backup for recording data)
- Radio/Phone

PSOs will use range finders to determine distances of fixed objects within the harassment zones to aid in marine mammal sighting documentation. Distances to animals will be based on the best estimate of the PSO, relative to the known distances to fixed objects near the mammal and PSO. Bearing to animals will be determined using a compass.

6. COMMUNICATIONS PLAN AND PROCEDURES

All new PSOs will be approved by the Navy and NMFS. The responsibility of the lead PSO will be to oversee orientation of new PSOs to the jobsite and the duties associated with marine mammal monitoring (including reporting, communication, etc.). Every shift that in-water noise generating activities are anticipated, three PSOs will be stationed at approved locations to best view the entire ROI.

The Lead PSO will be designated via identification of their status as Lead PSO on resume's submitted to the Navy for approval. The Contractor will identify multiple qualified Lead PSOs to assure adequate coverage of a Lead PSO on shift each day monitoring is required.

One PSO will be stationed on Berth 1 of the project site and will be in constant communication with crews and other PSOs during their shift; It will be their responsibility to alert the pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling crews of any protected species observed entering or approaching the shutdown zone. It will also be the duty of this PSO to communicate any instances where work will be delayed or ceased to the appropriate crews and inform them when they may resume activity. This may include, but is not limited to, a sighting of a marine mammal entering or within the shutdown zone before or during applicable work activities, or inclement weather preventing the shutdown zone from being viewed. The crew leader for each activity will oversee recording start/stop times of activities, construction type, and piling materials and will provide this information to Stantec via paper form (Attachment E). The second and third PSOs will be stationed at vantage points to best view the portion of the ROI located outside the basin and will be responsible for communicating the anticipated marine mammal trajectory to the PSO on Berth 1 by communicating observed marine mammal behavior, river conditions, and other notable river activities (such as fishing vessels or tankers utilizing the Federal Navigational Channel). PSOs will communicate in real time using cellphones or radios to convey mammal sightings, what construction activities are operating and any other pertinent information regarding monitoring events. This will be the most effective method of communication between PSOs and will reduce the potential for double counts of marine mammals or missed observations.

The Contractor shall conduct briefings between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling activities and when new personnel join the work. These briefings would explain responsibilities, communication procedures, marine mammal monitoring protocols, and operational procedures.

Additionally, the Contractor will provide the Navy with a verbal overview of observations and take counts during weekly project progress meetings. Any concerns related to level of take achieved or construction operations in relation to mammal behavioral observations will be voiced at that time and forwarded to the appropriate Navy Environmental Staff for review and appropriate follow up.

7. DATA COLLECTION AND REPORTING

Data collection by the PSOs will be completed primarily with the use of the Stantec developed App (Attachment A) or the approved sighting forms (Attachment B), including but not limited to:

- PSO name
- PSO location
- Activity at the time of sighting
- Estimated observed distance
- Distance and location of each observed marine mammal relative to the in-water construction activities
- Date and time that pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling events begin and end
- Construction activities occurring during each observation period
- Noise type (pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, and rotary drilling)
- Type of pile or casing and size
- Amount of time pile driving (vibratory and impact) and extraction, rock hammering, DTH hammer operation, or rotary drilling
- Weather parameters (e.g., percent cover, visibility)
- Water conditions (e.g., sea state, tidal state [incoming, outgoing, slack, low, and high])
- Species, numbers, and if possible, sex and age class of marine mammals
- Time of sighting
- Marine mammal behavior patterns observed, including bearing and direction of travel, and if possible, the correlation to SPLs
- Distance and bearing of marine mammals to activities and marine mammals to the observation point
- Locations of all marine mammal observations
- Estimated amount of time the marine mammal spent in the Level A, Level B or shutdown zone and closest point of approach
- Bubble curtain operations
- Other human activity in the area

PSOs will note all behavioral observations to the extent practicable if an animal has remained in the area during construction activities. Therefore, it may be possible to identify the same animal or if different individuals are being taken.

Monitoring Reports

Daily logs will be submitted to the Navy within 48- hours of every monitoring event. Observations occurring during monitoring will be reported with the use of paper form or monitoring app that has been developed and implemented by Stantec. The app (preferred monitoring/reporting tool) or forms (Attachment B) will be used to collect at minimum:

1. General data listed above
2. Pre-activity observational survey-specific data:
 - Date and time activities initiated and terminated

- Description of any observable marine mammal behavior in the immediate area during monitoring
 - Actions performed to minimize impacts to marine mammals
3. During activity observational survey-specific data:
- Description of all observable marine mammal behavior within monitoring zone
 - Description of observable marine mammal behavior in the immediate area surrounding monitoring zone
 - If possible, the correlation to underwater sound levels occurring at the time of this observable behavior
 - Actions performed to minimize impacts to marine mammals
 - Times when activity stopped due to presence of marine mammals within the shutdown zones and time when activity resumes
 - Total duration of driving time or removal time for each pile (vibratory driving) and number of strikes for each pile (impact driving)
 - Number, amount, and type of piles that were driven or extracted, and method type (i.e. impact, vibratory, DTH, rotary drilling, rock hammering)
 - Duration of impulsive/continuous for impact/rotary drilling
 - Number of strikes during impact driving events for impact hammer use
 - Duration of DTH use-combination impulsive and continuous
 - DTH strike rate
4. Post activity observational survey-specific data:
- Results, which include the detections of marine mammals, species and number observed, sighting rates and distances, and behavior reactions within and outside the manicuring zones
 - Cumulative number of takes
 - Quantity of rock, number and type of piles that were driven or removed and by what method.

In the event 70% of the take authorization is reached for any species the Contractor will notify the Navy.

8. RECORDINGS OF INCIDENTAL HARASSMENT TAKES

- a. **Level A Takes-** All mammals observed in the Level A harassment zone during noise generating activities will be recorded as a take. Data on behavior of observed marine mammals within the harassment zones will be collected and work will continue unless the mammal enters the shutdown zone, at which point work will cease. The maximum shutdown zone of 200-meters for HF cetaceans and 50-meters for pinnipeds will be implemented during concurrent noise generating activities.
- b. **Level B Takes-** All mammals will be documented when an animal enters the ROI during all noise generating activity as listed in Table 11-1. Takes will be recorded according to the requirements of the issued LOA for P-381.

9. REPORTING OF DEAD OR INJURED MARINE MAMMALS

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the issued LOA, such as serious injury or mortality, work must halt immediately. The incident must be reported to NAVFAC Natural Resource Manager (NRM) Ian Trefry 603-312-8487 or NAVFAC Installation Environmental Program Director Kari Moore (207) 438-4352 who will report the incident to NMFS in accordance with the LOA. In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the Holder must report the incident to the Office of Protected Resources (OPR), NMFS (PR.ITP.MonitoringReports@noaa.gov) and the NMFS analyst at (ITP.tyson.moore@noaa.gov) and to the Greater Atlantic Region New England/Mid-Atlantic Regional Stranding Coordinator (978-282-8478 or 978-281-9291) as soon as feasible. If the death or injury was clearly caused by the specified activity, the Holder must immediately cease the activities until NMFS OPR is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of this LOA. The Holder must not resume their activities until notified by NMFS.

The report must include the following information:

- Date, time, and location (latitude/longitude) of the first discovery (and any subsequent updated information)
- Description of the incident, including circumstances under which the animal was discovered
- Environmental conditions (wind speed and direction, BSS, cloud cover, and visibility)
- Description of all marine mammal observations and active sound source use in the 24 hours preceding the event
- Species identification or description of the animal(s) involved
- Condition of the animal (including carcass condition if the animal is dead)
- Observed behaviors of the animal if alive
- Photographs or video footage

10. QUALITY CONTROL

The monitoring app developed by Stantec will be the primary recording method for recording marine mammal observations, takes and to generate daily reports. PSOs will be trained in its use. The paper data-collection forms (Attachment B) will remain available for use as back up. Sighting reports gathered using the app will be uploaded daily. Data uploaded via the Stantec app will be stored on Stantec's project SharePoint site for QC. 381 Constructors will review the data that has been uploaded on a weekly basis to ensure accurate reporting. Data cannot be edited once it has been uploaded as part of Stantec data management and quality control plan, however, if a discrepancy is found during the 381 Constructors QC process the Lead PSO will inform Stantec, and it will be appropriately addressed. Alternately, if the paper form is utilized, it will be provided to Stantec for entering and uploaded to SharePoint for review and accounting of any observed takes.

11. REPORTING

Per LOA requirements, a draft report will be prepared and submitted to NMFS within 90 days after each activity year of this project. Within 30 days of receiving comments from NOAA on the draft report, a final report will be prepared and submitted to NMFS. To support this, the Contractor will provide the Navy a summary of construction activity for the LOA period and coordinate with the Navy's consultant for completion of the required report within 30 days of mammal monitoring completion or prior to the issuance of any subsequent LOA. The draft and final reports will include information collected on the daily sighting forms and acoustic reports such as:

- Locations of all marine mammal observations
- Other human activity in the area
- Actions performed to minimize impacts to marine mammals
- Detections of marine mammals
- Species and number observed
- Sighting rates and distances
- Behavioral reactions in/near harassment and shutdown zones
- Total number of marine mammal takes recorded throughout course of construction
- Information on marine mammal monitoring periods (dates/times and weather conditions).
- Details concerning construction activities.

12. MARINE MAMMAL OBSERVER QUALIFICATIONS

The Contractor will utilize PSOs who have no other construction-related tasks and who have been trained or have experience in identifying marine mammals and completing observations utilizing the reports and parameters identified in this plan. All PSOs must be experienced biologists with training in marine mammal detection and behavior approved by the Navy and NMFS prior to monitoring independently. The lead PSO must have prior monitoring experience. The observers will rotate shifts and coordinate breaks to reduce the chance of potential fatigue. PSOs will have the ability to communicate in real time with operations supervision to relay the location of marine mammals and any potential concerns or take situations.

Attachment A

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1.0 iOS AutoForm™ Installation

Stantec AutoForm™ iOS v4.1.0

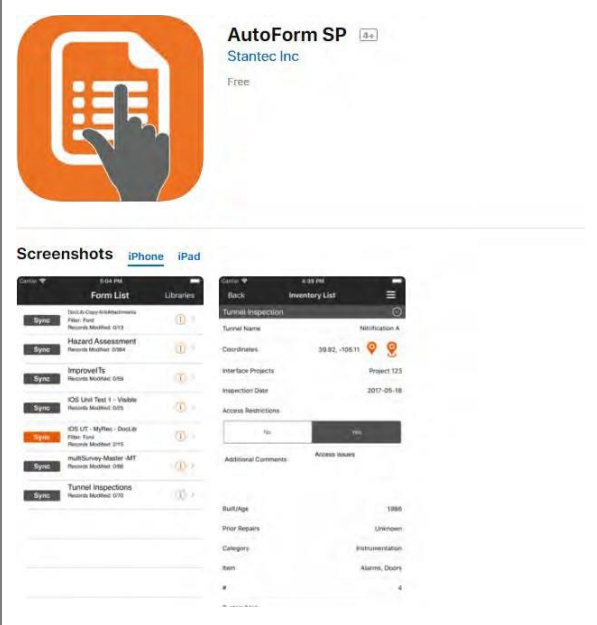
Release Date: 23 JUN 2020

Build: 4.3.7 (1)

Supported OS: iOS 13.x+

Supported Hardware: iPad Mini Retina/2 and up, iPad Air and up, iPhone 6/7 and up (iPad Pro and iPhone X/11 models not tested)


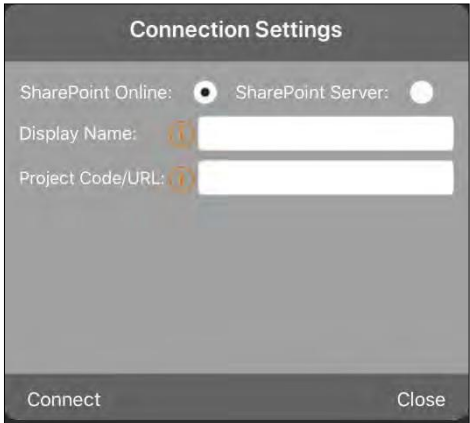
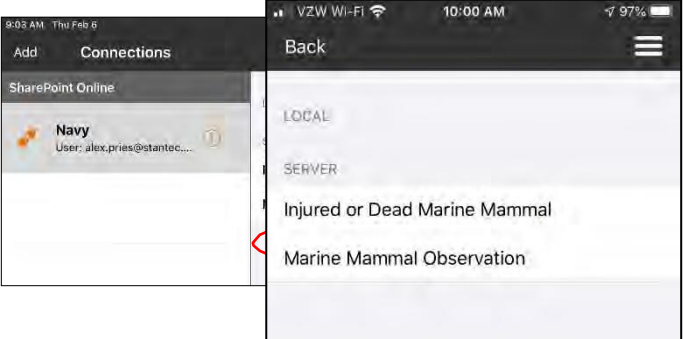
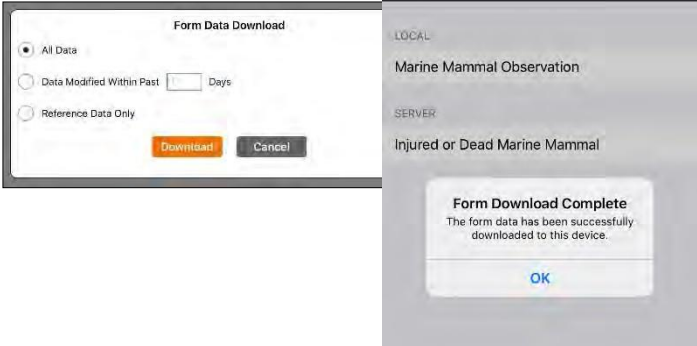
1. Open **AppStore**.
2. Search for *AutoForm SP*.
3. Download the app.



2.0 Create Your Form Connection

2.1 Create Form List

Open the **AutoForm™** app and create a new form list.

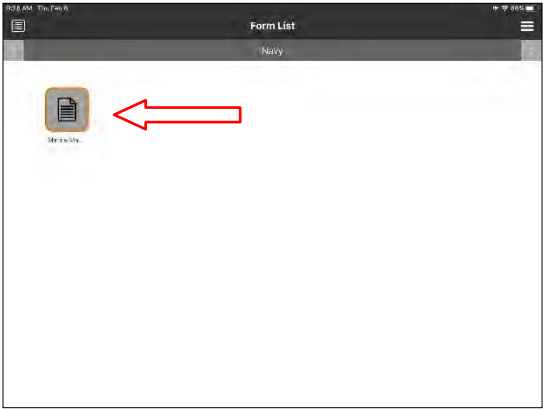

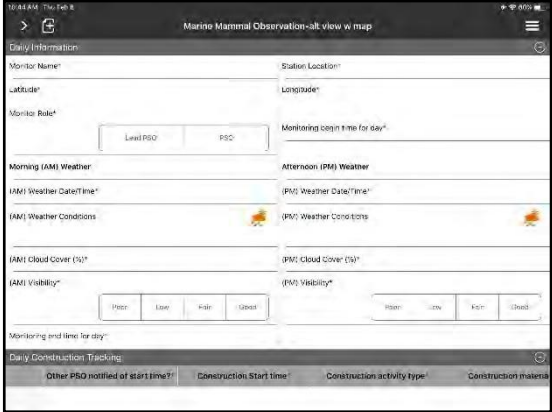
<ol style="list-style-type: none"> 1. Open the AutoForm™ app. 2. Tap Hamburger Button (☰) 3. Tap Connections. 4. Tap Add. 	
<p>Complete the following fields:</p> <p>SharePoint Online: Select Radio Button Display Name: Navy Project Code/URL: Navy Tap Connect.</p> <p><input type="checkbox"/> Follow instructions for Multi-Factor Authentication using your Corp account and Stantec credentials</p>	
<ol style="list-style-type: none"> 5. Tap the newly created <i>Navy</i> in the left panel. See notes below if an error message is displayed. 6. Tap to select <u>Marine Mammal Observation</u> under server section to move the form from the server to your device. 	
<ol style="list-style-type: none"> 7. Select type of preferred filter: <ul style="list-style-type: none"> <input type="checkbox"/> All Data <input type="checkbox"/> Data Modified Within Past (select date range) <input type="checkbox"/> Reference Data Only (lookup values) 8. Tap Download 9. Click OK after Form Download Complete prompt (form should now be under Local) <p>Tap Hamburger Menu (☰) and select Forms to return to the <i>Form List</i>.</p>	

Notes

- If you see an error message such as “Authentication Error or 901” or “Connection failed. Check the URL and try again”, check for the following conditions:
 - Internet access and Wi-Fi is turned on;
 - URL and Domain information is entered exactly as shown; and
 - Current Stantec username and password have been entered correctly.
- Permission is required for access to the SharePoint site AutoForm™. Confirm with your Project Manager or admin that you have been granted the correct SharePoint access.

3.0 Creating a Daily Record

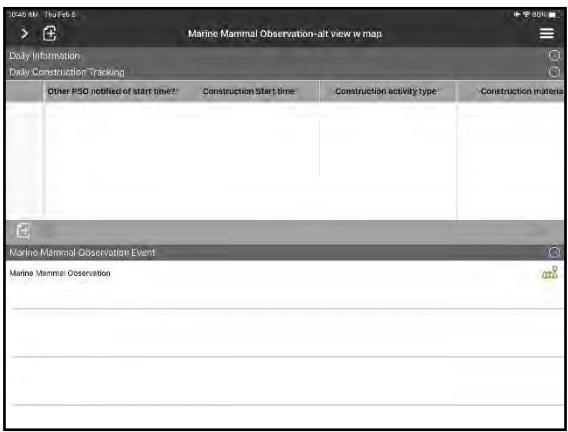
3.1 Introduction to P-310 Marine Mammal Monitoring App Forms

<ol style="list-style-type: none"> If not in the <i>Form List</i> display, tap the Hamburger Menu (☰) and select Forms to return to the <i>Form List</i>. In <i>Form List</i> display, tap the <u>Marine Mammal Observation</u> form. 	
<ol style="list-style-type: none"> On new screen (with AutoForm wallpaper), select the back arrow (←) to minimize the records list. Tap the plus icon (+) to create a new daily record 	
<ol style="list-style-type: none"> The P310 base screen shows 3 unique forms. All can be minimized using the Minus (⊖) button to create more display room. Daily Information form records: <ul style="list-style-type: none"> Monitor name and station location (approved sites) Station coordinates (auto-populated) Monitor role (Lead PSO or PSO) General start and end times for monitoring General AM and PM weather conditions (auto-populated based on device location) Date/time stamp for AM and PM weather AM and PM cloud cover and visibility AM and PM Beaufort Sea State 	

1. Daily Construction Tracking form allows for record/tracking of:

- Construction start and stop times
- Type of construction activity
- Type of construction material used
- Tides
- Whether IHA-required minimization measures were followed

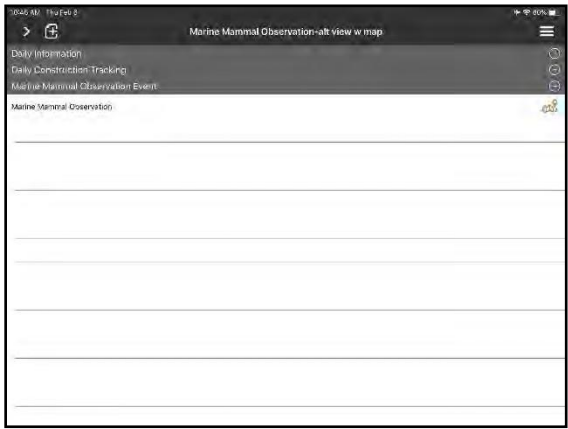
2. Document a new construction activity by selecting the plus icon (+) at the bottom left of the form



1. Marine Mammal Observation Event form is to be completed by Lead PSO or PSO when a marine mammal is sighted

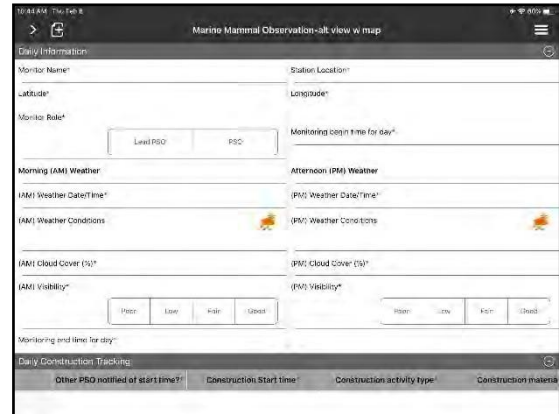
2. Allows for daily record/tracking of marine mammals in or near the Project area that may be subject to Level A or B harassment per the Project's IHA

3. Select the Folded Map icon (🗺️) to create a new marine mammal observation



3.2 Working with the Daily Information Form

1. Daily Information form should be completed by Lead PSO and PSOs at start/end of an observation day
2. To complete this form:
 - Select approved monitor name from drop-down menu
 - Select approved station location from drop-down menu
 - Coordinates automatically displayed based upon station location selection
 - Select monitor role (Lead PSO vs. PSO)
 - Select monitoring start time (e.g., arrival onsite) using drop-down menu
 - Select time stamp for AM or PM general weather observation
 - Press the cloud icon ☁️ to capture current weather information based on device GPS location
 - Select AM or PM cloud cover (%) using the drop-down menu
 - Select AM or PM visibility by selecting from the available options
 - Select AM or PM Beaufort Sea State (refer to Beaufort Sea Scales)
 - Select monitoring end time (e.g., departure from site) using drop-down menu

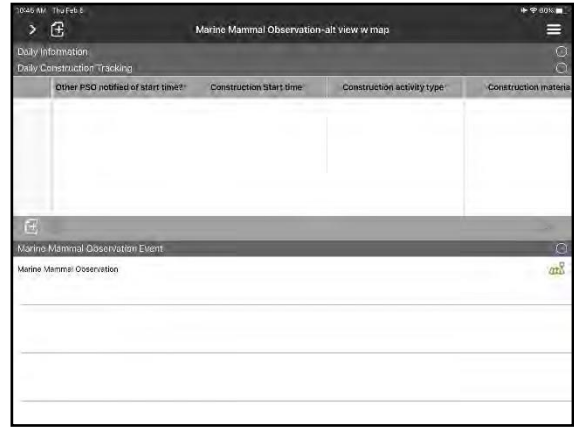


Notes

- Data and entries are saved in real time to the local device as information is recorded.

3.3 Working with the Daily Construction Tracking Form

1. Daily Construction Tracking form is required to be completed by the day's Lead PSO as part of IHA reporting requirements
2. Completion of this form also provides Lead PSO with reminder to inform other PSOs of changes in daily construction activities and/or materials being used (and corresponding changes in Zones of Influence ZOIs)
3. Document a new construction activity by selecting the plus icon (+) at the bottom left corner of the form



1. To complete this form:

- Select activity start time from drop-down menu
- Select construction activity type from drop-down menu
- Select construction material used from drop-down menu
- Select tidal state at start of activity
- Select Yes/No if IHA Minimization Measures were used prior to activity start
- Select activity end time from drop-down menu

Notes:

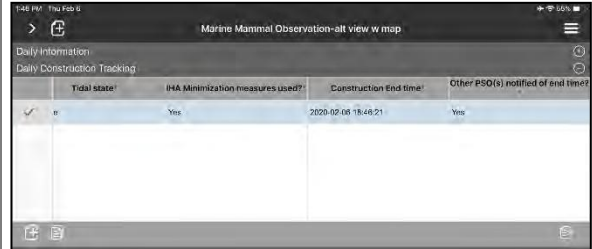
- New construction tracking records are required when there is a gap in noise-generation activities of five minutes or more
- High and Low Tide should be recorded only during the 30 minute period (i.e. slack tide) before or after these events. Ebb tide refers to an outgoing or falling tide, while flood or flow tide refers to an incoming or rising tide.



1. To create a copy of a previous construction activity, select the check box to the left of the record, and press the duplicate icon ().

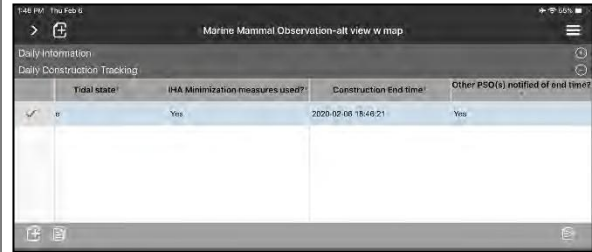
This action is useful for situations:

- when a construction activity stops but begins again after a period of 30 minutes or more, requiring adherence to IHA soft-start measures
- when the same construction activity and materials are used consistently through the day but with periodic breaks to adjust location, meal breaks, equipment failure, etc.



1. To delete a copy of a previous construction activity, select the check box to the left of the record, and press the delete icon ().

This action is useful when a construction activity record is created by mistake.



Notes

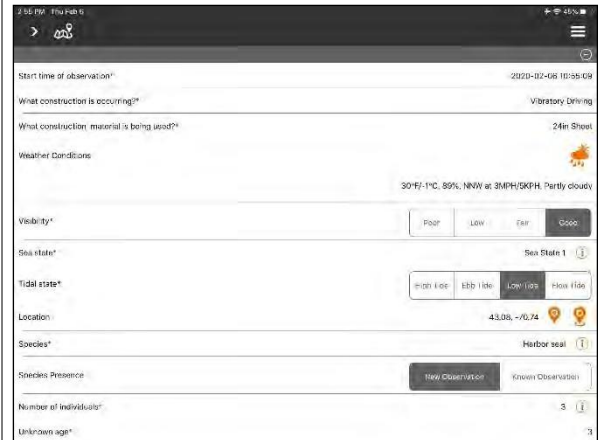
- Data and entries are saved in real time to the local device as information is recorded.

3.4 Working with the Marine Mammal Observation Event Form

<p>1. Select the Folded Map icon (🗺️) to create a new marine mammal observation</p>	
<p>1. A new map screen will appear (if connected via WiFi or Cellular data) 2. Drop a pin on the map to delineate the observation location 3. Select "Yes" to create a new record, or "Cancel" to drop a new pin or cancel record 4. Select "Back" to return to P-310 Base Screen</p>	
<p>1. After selecting "Yes", the marine mammal record form will appear in a new screen 2. Minimize record history by selecting the back arrow (←) or expand record history by selecting it again</p>	<p>Use back arrow to minimize or expand record history</p>

1. To complete this form:

- Select observation start time from drop-down menu
- Select construction activity from drop-down menu (should be communicated by Lead PSO)
- Select construction material used from drop-down menu
- Press the cloud icon ☁️ to capture current weather information based on device location
- Choose visibility by selecting from the available options
- Select Beaufort Sea State at start of observation
- Select tidal state at state of observation
- Observation coordinates (auto-populated)
- Select species from drop-down menu (see notes)
- Select if species presence is a new observation or known observation (see notes)
- Estimate the number of individuals using the drop-down menu
- Estimate the number of unknown age, juvenile, and adult individuals for observation using drop down menus
- Estimate the number of unknown sex, male, and female individuals for observation using drop down menus
- Record behaviour and movement of individuals (from construction activity) using toggle menu
- Record bearing of marine mammal(s) from disturbance (0-360°)
- Record distance (meters) and bearing (0-360°) of marine mammal(s) from PSO
- Record bearing of PSO to disturbance (0-360°)
- Record (using maps of Project ZOIs) if observation results in Level A or B take
- Record if observation required notification to Lead PSO
- Record if observation required construction delay or shutdown
- Include any additional comments/notes
- Select observation end time from drop-down menu
- Select if observation requires further review during QA/QC



2:55 PM Thu Feb 6

Start time of observation* 2020-02-06 10:55:09

What construction is occurring? Vibratory Drilling

What construction material is being used? 24in Sheet

Weather Data/Icons 30°F/-1°C, 85% NNW at 3MPH/5KPH, Partly cloudy

Visibility* Poor Low Fair Good

Sea State* Sea State 1

Tidal state* High Tide Low Tide

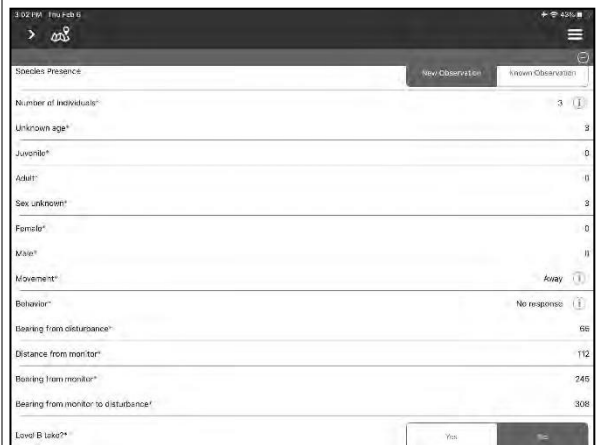
Location 43.08, -70.74

Species* Harbor seal

Species Presence New Observation Known Observation

Number of individuals* 3

Unknown age* 3



3:02 PM Thu Feb 6

Species Presence New Observation Known Observation

Number of individuals* 3

Unknown age* 3

Juvenile* 0

Adult* 0

Sex unknown* 3

Female* 0

Male* 0

Movement* Away

Behavior* No response

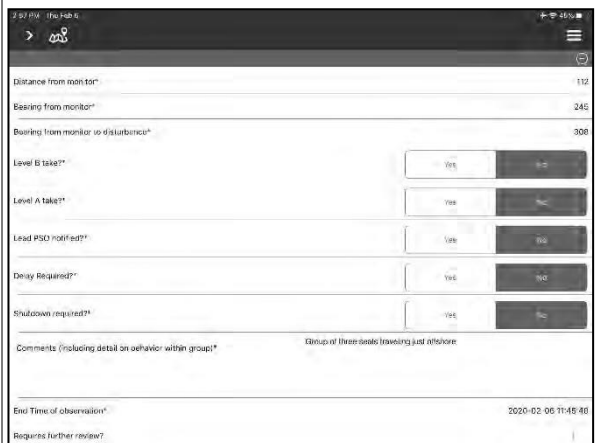
Bearing from disturbance* 66

Distance from monitor* 112

Bearing from monitor* 245

Bearing from monitor to disturbance* 308

Level B take* Yes No



3:07 PM Thu Feb 6

Distance from monitor* 112

Bearing from monitor* 245

Bearing from monitor to disturbance* 308

Level B take* Yes No

Level A take* Yes No

Lead PSO notified* Yes No

Delay Required* Yes No

Shutdown required* Yes No

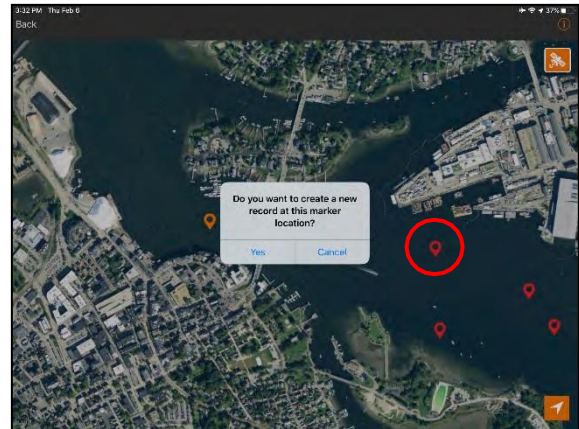
Comments (including detail on behavior within group)* Group of three seals traveling just offshore

End Time of observation* 2020-02-06 11:48:48

Requires further review?

CREATING NEW OBSERVATIONS:

1. To create a new Marine Mammal Observation Event record, select the folded map 🗺️ icon to bring up the map screen (**Note:** All previous observation records will be displayed on the map screen – see red circle as example)
2. Drop a pin in observation location and repeat steps as previously described



REVIEWING, EDITING, AND DELETING OBSERVATIONS:

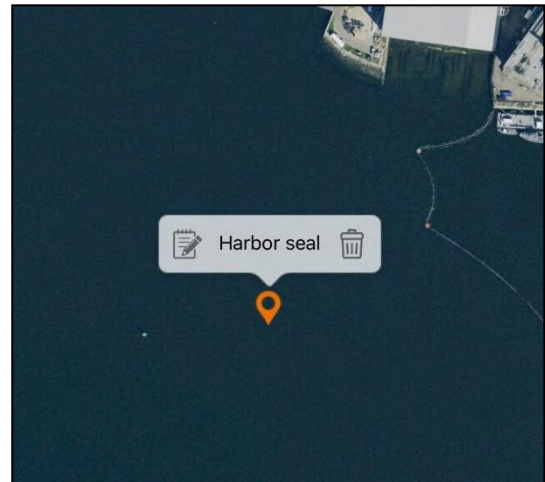
1. Observations may be reviewed, edited, or deleted, in the field through two methods:

OPTION #1: Map Screen

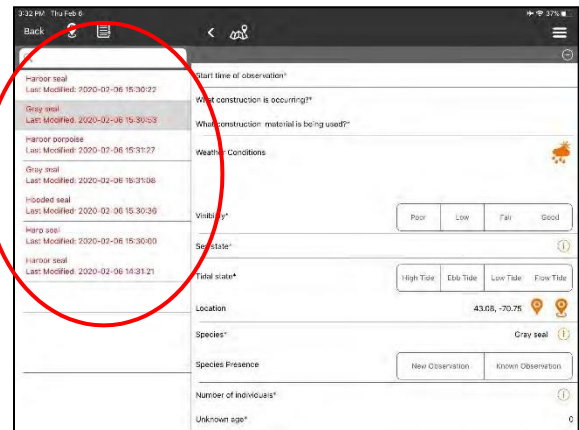
- Select the folded map 🗺️ icon to bring up the map screen to see all previous observation records.
- Select the record to review
Use the notepad 📝 icon to review and edit.
Use the trash can 🗑️ icon to delete.

OPTION #2: Expand Record History

- Select back arrow ⬅️ to show all previous observation records
- Select the record to review (now highlighted in grey) and make edits in form screen to the right
- Swipe left across selected record to see red "delete" prompt and select it for deletion. A pop-up prompt will confirm the decision to delete.



Note: After syncing to the P-310 Project dashboard, observation records may not be edited without formal request.




Notes

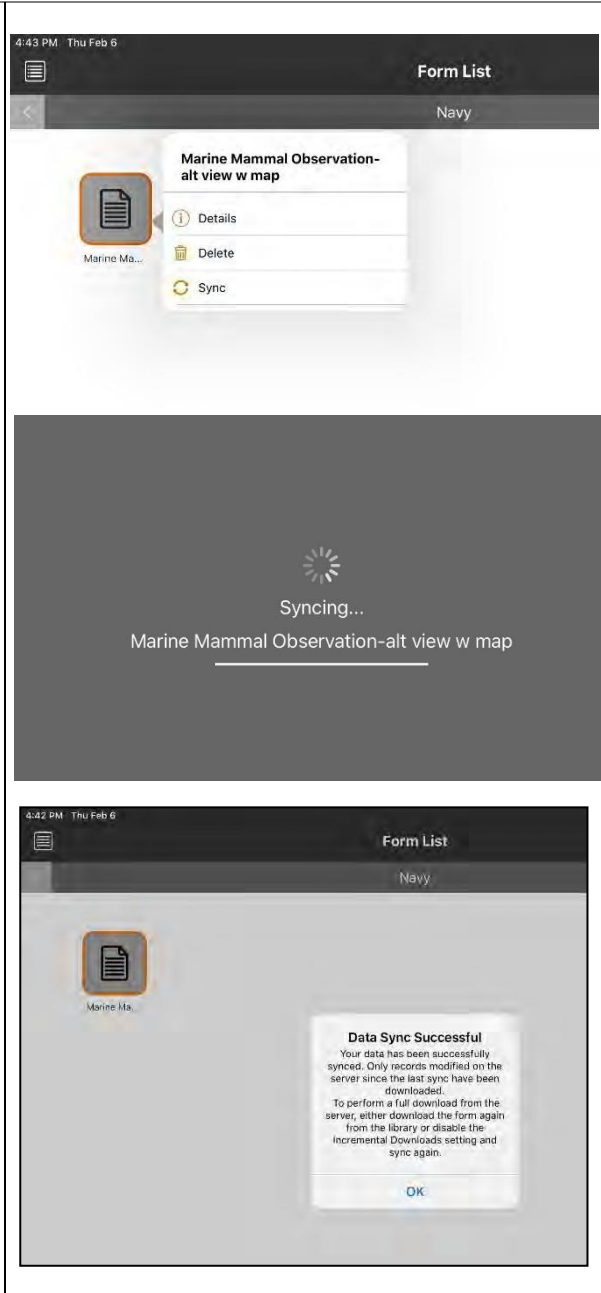
- ❑ One species should be selected per observation record. In cases of mixed species groups, use a separate observation record for each species.
- ❑ PSOs must communicate with each other to avoid duplicate counts towards a take. The species presence entry allows for tracking of known individuals but reduces the risk of double counts by marking records as previously known occurrences.

5.0 Syncing Records with P-310 Project Dashboard

At the end of the monitoring day, the Lead PSO and PSOs should doublecheck their Daily Information, Daily Construction Tracking, and Marine Mammal Observation Event forms prior to syncing the data with the P-310 Project Dashboard.

Important Reminder: data cannot be edited after syncing with the Project Dashboard without formal request and a QA/QC process to document the rationale for the request.

1. To sync the day's records, return to the P-310 Base Screen and click the forward arrow  icon to expand the record history.
2. Select the "Back" Button to return to the Form List screen.
3. Press and hold the Marine Mammal Observation icon until the prompt appears.
4. Select the "Sync" button on the prompt and allow the App to complete the process.
5. A Data Sync Successful pop-up screen will appear after the sync is successful.
6. Click OK to finish.




6.0 AutoForm™ Tips and Tricks

1. Do not delete a record when working in the Form Connection on the iPad. This will delete the record from the iPad and the collaboration site.
2. Be careful when opening a new record; check the name/number to ensure you are opening the correct record.
3. When copying a record, confirm data is updated for the new record:
 - i. *Report Date*
 - ii. Review all fields to confirm relevant data is changed and the new record is accurate.
4. Sync records as they are created or edited.
5. When editing an existing record, double check the record name/number to confirm you are opening the correct record.
6. When generating a report to print or save a record in PDF format, check the Segment, Spread and date range criteria.
7. Deleting a form from the Form Connection will also delete any un-synced records from the iPad.
8. When a new release of AutoForm™ becomes available, check the latest version is compatible with your device and save your data BEFORE you upgrade.

7.0 Need Help?

7.1 AutoForm™ Help

<p>1. Open Hamburger Menu. 2. Tap Help.</p>	
<p>3. The Help screen will appear.</p>	
<p>4. Swipe to the left to go through help screens.</p>	

7.2 mTOOLS™ Support

For support, please email mTOOLS.Support@stantec.com or contact your Project Manager or admin.

Attachment B

Weather AM _____ Time: _____ Wind Spd/Dir _____ Temp (F) _____ Cld Cover (%) _____ Humid(%) _____ BSS _____ Visibility _____
 PM _____ Time: _____ Wind Spd/Dir _____ Temp (F) _____ Cld Cover (%) _____ Humid(%) _____ BSS _____
 _____ Visibility _____

Construction Activity Info					Marine Mammal Observation*					
Event Info (circle all applicable)	Pile Material Used (circle all applicable)	Time of Event (start and end if applicable)	PSO Name	Tidal State	Species (use code)	Distance and Bearing from PSO (m and degrees)	# Animals & Sex (min/max/best est) # of calves	Movement Relative to Noise	Behavior Code Note Any Change In Behavior	Take Types / Number
Start of Day, End of Day Vibratory, Impact, Drilling, Blasting Sighting, Delay, Shutdown	NZ26 / NZ14 / W24 P PZC18 / 30" Pipe 4.5" Bore Hole	: :				____m ____o	/ / / __ M__ F_UNK __ AD_IV UNK	Towards, Away, Parallel		Level A: ____ indvs Level B: ____ indvs
Start of Day, End of Day Vibratory, Impact, Drilling, Blasting Sighting, Delay, Shutdown	NZ26 / NZ14 / W24 P PZC18 / 30" Pipe 4.5" Bore Hole	: :				____m ____o	/ / / __ M__ F_UNK __ AD_IV UNK	Towards, Away, Parallel		Level A: ____ indvs Level B: ____ indvs
Start of Day, End of Day Vibratory, Impact, Drilling, Blasting Sighting, Delay, Shutdown	NZ26 / NZ14 / W24 P PZC18 / 30" Pipe 4.5" Bore Hole	: :				____m ____o	/ / / __ M__ F_UNK __ AD_IV UNK	Towards, Away, Parallel		Level A: ____ indvs Level B: ____ indvs
Start of Day, End of Day Vibratory, Impact, Drilling, Blasting Sighting, Delay, Shutdown	NZ26 / NZ14 / W24 PZC18 / 30" Pipe 4.5" Bore Hole	: :				____m ____o	/ / / __ M__ F_UNK __ AD_IV UNK	Towards, Away, Parallel		Level A: ____ indvs Level B: ____ indvs
Start of Day, End of Day Vibratory, Impact, Drilling, Blasting Sighting, Delay, Shutdown	NZ26 / NZ14 / W24 PZC18 / 30" Pipe 4.5" Bore Hole	: :				____m ____o	/ / / __ M__ F_UNK __ AD_IV UNK	Towards, Away, Parallel		Level A: ____ indvs Level B: ____ indvs
Start of Day, End of Day Vibratory, Impact, Drilling, Blasting Sighting, Delay, Shutdown	NZ26 / NZ14 / W24 P PZC18 / 30" Pipe 4.5" Bore Hole	: :				____m ____o	/ / / __ M__ F_UNK __ AD_IV UNK	Towards, Away, Parallel		Level A: ____ indvs Level B: ____ indvs
Start of Day, End of Day Vibratory, Impact, Drilling, Blasting Sighting, Delay, Shutdown	NZ26 / NZ14 / W24 P PZC18 / 30" Pipe 4.5" Bore Hole	: :				____m ____o	/ / / __ M__ F_UNK __ AD_IV UNK	Towards, Away, Parallel		Level A: ____ indvs Level B: ____ indvs
Start of Day, End of Day Vibratory, Impact, Drilling, Blasting Sighting, Delay, Shutdown	NZ26 / NZ14 / W24 P PZC18 / 30" Pipe 4.5" Bore Hole	: :				____m ____o	/ / / __ M__ F_UNK __ AD_IV UNK	Towards, Away, Parallel		Level A: ____ indvs Level B: ____ indvs
Start of Day, End of Day Vibratory, Impact, Drilling, Blasting Sighting, Delay, Shutdown	NZ26 / NZ14 / W24 PZC18 / 30" Pipe 4.5" Bore Hole	: :				____m ____o	/ / / __ M__ F_UNK __ AD_IV UNK	Towards, Away, Parallel		Level A: ____ indvs Level B: ____ indvs

* For all species observations entered, note physical location on attached map with species code, date, and time.

Species Codes: HBPP (Harbor porpoise); HBSE (Harbor seal); GRSE (Gray seal); HDSE (Hooded seal); HPSE (Harp seal); OTHR (Other species; list name)
 Behavioral Codes: 1) no response, 2) head alert (looks towards disturbance), 3) approaches in water, or 4) retreat or flush (leaves the area or flushes from haul-out site).

Other Monitoring Notes: Was there noise making today? Yes / No _____ Were there mammal sightings today? Yes / No _____	Comments:
--	-----------

PSNYPOC: Ian Trefry at ian.trefry@navy.mil or 207.438.4362
 NAVFACMIDLANTPOC: Jessica Bassi at jessica.bassi@navy.mil or 757.341.0493

Attachment C

PSO	PSO Status	NMFS Approval Date	Request	Relevant Experience
Andrews, Morgan	PSO	September 2020	Lead PSO	Bachelors of Science in Marine Biology At Sea Monitor and NEFOP Observer P-310 Multi Mission Drydock and Portal Crane Extend - Protected Species Observer P-381 - Protected Species Observer Graduated 2017 Jan 2018 - Sept2020 September 2020 - Dec 2021 March 2023 - Current
Barton, Sierra	PSO			Bachelors of Science in Wildlife and Conservation Biology P-381 - Protected Species Observer Graduated 2022 Oct 2022 - Current
Bushey, Ethan	PSO		Lead PSO	Bachelors of Science in Marine Biology RPS - Protected Species Observer P-381 - Protected Species Observer Graduated 2022 July 2020 - Oct 2022 Nov 2022 - Current
Colombo, Amanda			PSO	Bachelors of Science in Biology - Concentration in Ecology Maine Audubon - Shorebird Biologist Graduated 2019 Apr 2022 - July 2022
Downs, Chloe	PSO	September 2021	Lead PSO	Bachelors of Science in Ecology Environmental Sciences - Concentration in Marine Ecology Protected Species Observer Training - AIS Observers P-310 Multi Mission Drydock and Portal Crane Extend - Protected Species Observer P-381 - Protected Species Observer Graduated 2021 Sept 2021 Sept 2021 - Nov 2021 Dec 2021 - Current
Erickson, Molly	PSO		Lead PSO	Bachelors of Science in Marine, Estuarine, and Freshwater Biology Masters Degree in Marine Biology P-381 - Protected Species Observer Graduated 2020 Graduated 2022 May 2022 - Current
Hallett, Theodore	Lead PSO	January 2020		Protected Speices Observer Training - AIS Observers P-310 Multi Mission Drydock and Portal Crane Extend - Protected Species Observer P-381 - Protected Species Observer Blue Hill Jan 2020 Jan 2020 - Dec2021 Jan 2022 - Current Oct 2022 - Nov2022
Rancourt, Sabrina	Lead PSO	April 2017		Bachelors of Science in Marine Biology Berth 11 Protected Speices Observer Training - AIS Observers P-310 Multi Mission Drydock and Portal Crane Extend - Protected Species Observer P-381 - Protected Species Observer Blue Hill Graduated 2017 Apr 2017 - Aug 2019 Jan 2020 Oct 2019 - Dec2021 Jan 2022 - Current Oct 2022 - Nov2022
Wyman, Stephen	PSO	June 2021	Lead PSO	Protected Speices Observer Training - AIS Observers P-310 Multi Mission Drydock and Portal Crane Extend - Protected Species Observer P-381 - Protected Species Observer June 2021 June 2021 - Dec 2021 Jan 2022 - Current

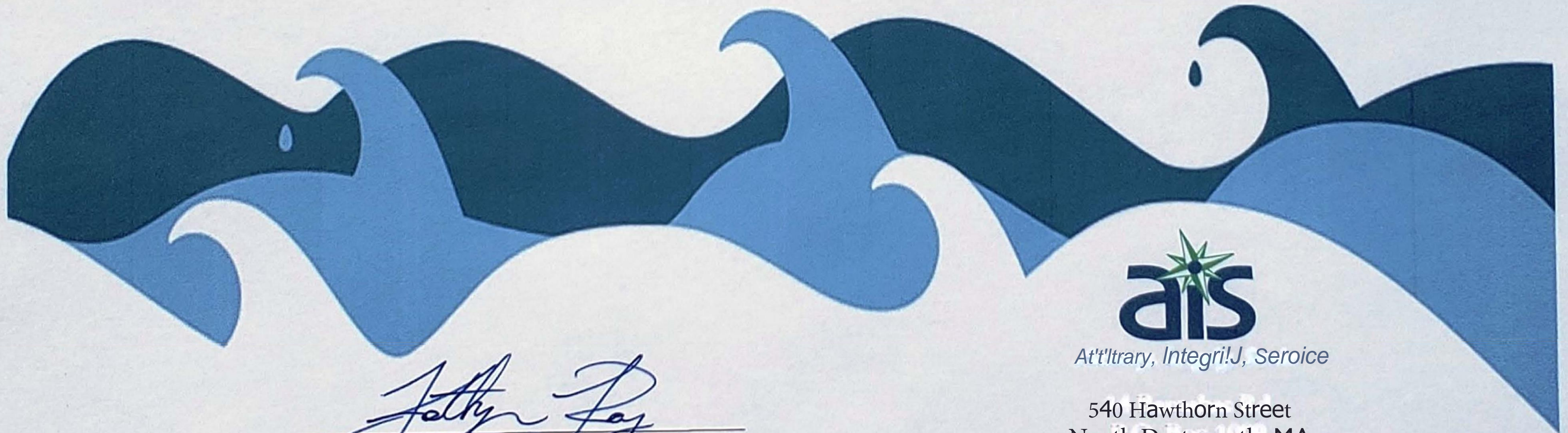
PROTECTED SPECIES OBSERVER CERTIFICATION

THIS DOCUMENT CERTIFIES THAT

Sabrina Rancourt

Has successfully completed the Protected Species Observer (PSO) training course with an overall examination score of 80% or greater which complies with BOEM/BSEE basic training criteria under BOEM NTL 2016-Go2

Awarded this 31st day of January, 2020




Kathryn Roy
BOEM Approved Instructor


Att'ltrary, Integri!J, Seroice
540 Hawthorn Street
North Dartmouth, MA
aisobservers.com
aisobservers.com

PROTECTED SPECIES OBSERVER CERTIFICATION

THIS DOCUMENT CERTIFIES THAT

Stephen M. Wyman

Has successfully completed the Protected Species Observer (PSO) training course for seismic surveys in the Gulf of Mexico and US Atlantic G&G Surveys with an overall examination score of 80% or greater which complies with BOEM/BSEE basic training criteria under BOEM NTL.

Awarded this 4th day of June, 2021



Sarah Fortuna

Sarah Fortuna
Instructor



Accurancy, Integrity, Service

540 Hawthorn Street
North Dartmouth, MA
www.aisobservers.com

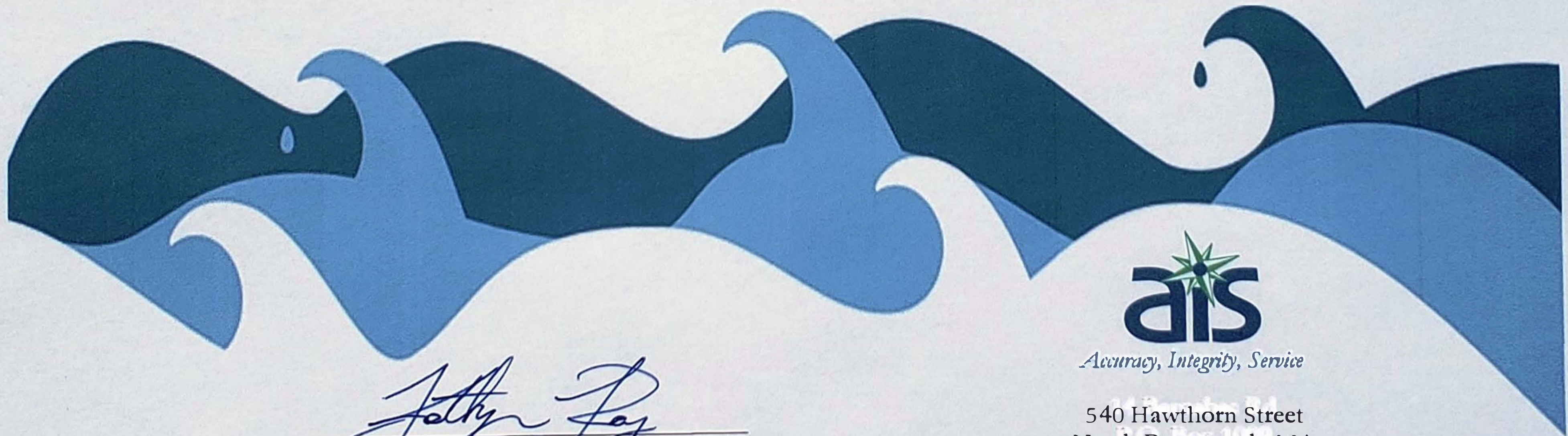
PROTECTED SPECIES OBSERVER CERTIFICATION

THIS DOCUMENT CERTIFIES THAT


Teddy Hallett

Has successfully completed the Protected Species Observer (PSO) training course with an overall examination score of 80% or greater which complies with BOEM/BSEE basic training criteria under BOEM NTL 2016-G02

Awarded this 31st day of January, 2020




Kathryn Roy
BOEM Approved Instructor


Accuracy, Integrity, Service
540 Hawthorn Street
North Dartmouth, MA
aisobservers.com
aisobservers.com

PROTECTED SPECIES OBSERVER CERTIFICATION

THIS DOCUMENT CERTIFIES THAT

Chloe Elizabeth Downs

Has successfully completed the Protected Species Observer (PSO) training course for seismic surveys in the Gulf of Mexico and US Atlantic G&G Surveys with an overall examination score of 80% or greater which complies with BOEM/BSEE basic training criteria under BOEM NTL.

Awarded this 16th day of September, 2021



Sarah Fortuna

Sarah Fortuna
Instructor



Accuracy, Integrity, Service

540 Hawthorn Street
North Dartmouth, MA
www.aisobservers.com

Ethan Bushey

EDUCATION

University of New Hampshire, Durham New Hampshire

Graduation May 2022

- B.S. in Marine Biology | Minor in Oceanography
- Relevant coursework: Sustainable Fisheries, Introduction to Aquatic Botany, Biodiversity and Ecology, Introductory Biology: Molecular and Cellular, Basic SCUBA, General Ecology, Chemical Oceanography, Biological Oceanography, Genetics, Statistics, Physics 1 & 2, Entomology

Kenai Peninsula College, Homer Alaska

August 2019 - December 2019

Relevant coursework: Marine Mammalogy, Ichthyology, Marine Biology, Global Climate Change

EXPERIENCE

Cianbro, Portsmouth Naval Shipyard – Protected Species Observer

November 2022 - Present

- Watched for pinnipeds and other various marine mammals from sunrise to sunset during pile driving and drilling construction activity at the Portsmouth Naval Shipyard
- Filled out daily observation logs
- Obtained special civilian clearance on the Shipyard to enter the CIA zone
- Communicated sightings to other observers

RPS – Protected Species Observer

July 2020 - Oct 2022

- Photographed protected marine mammals off the coast of Virginia and in the Gulf of Mexico
- Implemented necessary impact mitigation procedures outlined in a NOAA and BOEM drafted Environmental Management Plan
- Cohabitated with several other crewmembers in tight quarters for extended periods of time
- Inputted and submitted large sums of data in a timely manner using Excel

Happywhale – Internship

March 2020 – January 2021

- Matched humpback whale flukes from several organizations with images on the Happywhale database
- Identified numerous marine mammal species from photographs taken during oceanic cruises
- Worked with Happywhale's citizen science program handling and processing individual submissions
- Formatted/Interpreted countless year long datasets from organizations like the Hawaii Marine Mammal Consortium, Winged Whale Research, and the University of Baja California Sur

NOAA, Homer Alaska – Internship

August 2019 – December 2019

- Assisted with coastal ecosystem monitoring programs by looking at sea star wasting disease impacts on local species
- Gathered CTD survey samples in Kachemak Bay for a long-term oceanographic data set
- Measured Blue Mussel growth from several core samples taken during an unusual recruitment event

Winged Whale Research, Homer Alaska – Internship

August 2019 – February 2020

- Successfully photographed and identified humpback whales in Kachemak Bay
- Gained experience operating vessels and working with high end cameras
- Improved and reformatted a 39 year long data set of humpback whale sightings using Microsoft Excel

Alaska Fish and Game, Ketchikan Alaska – Fish and Game Technician II

June 2019 – August 2019

- Collected genetic and otolith samples from various commercial fish species
- Enhanced my understanding of the Alaskan Salmon and Black Cod industries
- Built stronger communication skills while obtaining catch information from fishing boat captains

SKILLS

- Assisted with several marine mammal necropsies
- Experience teaching children ages 10-17 in a camp setting
- Strong understanding on the importance of conservation
- Proficient in identifying marine mammals

CERTIFICATIONS

- Open water SCUBA
- Protected Species Observer (PSO)
- CPR/AED
- BOSIET (2020)
- OGUK medical for offshore work (2020)

Ethan Bushey

750 Harvey Mtn Rd, Barnet Vermont, 05821 Cell: 802-424-6522 Email: ethan3847@gmail.com

Professional Website: <https://ethan3847.wixsite.com/mysite/home>

ADDITIONAL EXPERIENCE

- Honed public speaking skills, developed over the past 6 years by presenting personal research and reporting on others'
- Comfortable working with large data sets
- 68 sea days as a PSO
- Spent countless hours identifying and cataloguing butterflies as an entomology research assistant

Molly Erickson

EDUCATION

University of New Hampshire, Durham, NH

In Progress

Marine Biology M.S.

Advisor: Dr. Elizabeth Harvey

Topic: Seasonal Variability of Phytoplankton Population Dynamics

GPA: 4.00

University of New Hampshire, Durham, NH

May 2020

Bachelor of Science in Marine, Estuarine, and Freshwater Biology

GPA: 3.71

Relevant Coursework: Biological Oceanography, Ecology of Aquatic Invasive Species, Elasmobranchs and Bony Fishes, Aquatic Botany, Limnology, Introduction to Marine Biology, Marine Biological Investigations, Undergraduate Ocean Research, Vertebrate Morphology, Animal Physiology, Applied Biostatistics, Experimental Design, Introduction to R Statistical Software, Data Science with R for the Life Sciences, Geographical Information Systems (GIS) for Earth and Environmental Systems

Awards: Dean's Scholarship, Civil War Memorial Scholarship, Dickie Scholarship

PUBLICATIONS

Erickson, M.R., and Harvey, E.L. "Seasonal Variability of Phytoplankton Population Dynamics in Coastal New Hampshire" (*in preparation*)

Winter, T.A., Erickson, M.R., Hamel, O., Vajda, Z.B., and Harris, L. "Exploration into Efficient and Inexpensive Methods of Aquaculture for the Green Sea Urchin, *Strongylocentrotus droebachiensis*" (*in preparation*)

Winter, T.A., Moline, S., Erickson, M.R., Dean, M., and Harris, L. "Determining optimal conditions for aquaculture of *Strongylocentrotus droebachiensis* through nutritional, behavioral, and larval studies" (*in preparation*)

FUNDING

School of Marine Sciences and Ocean Engineering, University of New Hampshire 2021- \$1450

University of New Hampshire Sea Grant 2018-2020- \$1000

PRESENTATIONS

Seasonal Variability of Phytoplankton Population Dynamics in Coastal New Hampshire-
University of New Hampshire Department of Biological Sciences Graduate Student Seminar
Series 2021

Determining Optimal Methods for the Aquaculture of Strongylocentrotus droebachiensis-
University of New Hampshire Undergraduate Research Conference 2019

NEAq Internship Experience: Freshwater Gallery- New England Aquarium Intern Conference
2019

RELEVANT EXPERIENCE

Graduate Teaching Assistant	20 Hours/Week
Introduction to Marine Biology	August-December 2021
Biological Oceanography	August-December 2021
Animal Physiology	February-May 2021
Comparative Morphology and Biology of Vertebrates	September-December 2020

- Developed laboratory curriculum, lectured, graded assignments, monitored lab practicals, communicated with students

Cianbro, Portsmouth Naval Shipyard (Marine Mammal Observer) May 2022 - Present

- Watched for marine mammals during pile driving operations
- Identified and documented marine mammal sightings
- Located and identified species of marine mammals and their bearings
- Maintained required logs

Undergraduate Ocean Research September 2018-May 2020

- Performed nutritional and behavioral research of *Strongylocentrotus droebachiensis* to determine optimal growth conditions for aquaculture
- Presented research in the University of New Hampshire Undergraduate Research Conference 2019
- Publication in preparation

Maria Mitchell Aquarium (College Intern)

May-August 2019, 30 Hours/Week

- Helped manage a small aquarium in Nantucket, MA
- Assisted with training a team of interns
- Collected a variety of species local to the Cape and Islands in the Gulf of Maine
- Netting, handling, and measuring fish and other species
- Led educational programs such as feeding tours and beach ecology field trips
- Educated the public on a variety of marine species and the importance of marine conservation
- Performed a variety of tasks as an aquarist such as maintaining species health and meeting their nutritional requirements

Marine Mammal Alliance Nantucket

May-August 2019

- Volunteered on the rescue team for the Marine Mammal Alliance of Nantucket
- Monitored beaches for injured and dead seals, recorded deaths, reported injuries and seal population dynamics

Horseshoe Crab Surveys

May-June 2019

- Participated in surveying horseshoe crab populations for the State of Massachusetts
- Monitored populations and mating pairs on Monomoy Beach, Nantucket, MA to aid in future conservation efforts

New England Aquarium (Freshwater Gallery Intern)December 2018-January 2019
25 Hours/Week

- Performed animal care at the New England Aquarium
- Worked in the Freshwater and Northern Waters Galleries: temperature measurements, cleaning tanks, raising juveniles, maintaining nutritional requirements for a diverse array of species
- Animals worked with include octopuses, anacondas, piranhas, arowanas, urchins, anemones, flounders, lobsters, cardinal tetras, electric eels, catfish, trout, and salmon

LABORATORY AND FIELD SKILLS

- Proficient with measurement and analysis techniques used in marine, freshwater, forest, and wildlife management, such as collection/interpretation of water quality data, shoreline surveys, quadrat sampling, DBH method, salinity measurements, phytoplankton and zooplankton sampling, seining, fluorometer, flow cytometer, and FlowCam
 - PCR, gel electrophoresis, cell culture, quadrant streaking isolation, media inoculation, BLAST sequence analysis, Sanger sequencing, Bradford assays, restriction digests, gene cloning
 - Experience identifying a variety of organisms such as algae, seagrasses, fishes, mammals, birds, and invertebrates
 - Experience with data entry, creating technical documents, computerized graphics, MS Word, PowerPoint, Excel, QGIS, ArcGIS, R, Bash, Python, and JavaScript
-

SERVICE AND OUTREACH

Invited judge- University of New Hampshire Undergraduate Research Conference 2021

PROFESSIONAL AFFILIATIONS

American Fisheries Society	September 2020- present
Phi Sigma Biological Sciences Honor Society	September 2019- May 2020
Zoological Society	August 2019- May 2020

REFERENCES

Elizabeth Harvey, Ph.D.
Advisor
Biological Sciences
University of New Hampshire
elizabeth.harvey@unh.edu

István Mikó, Ph.D.
Research Scientist II
Biological Sciences
University of New Hampshire
istvan.miko@unh.edu

Janet Anderson, Ph.D.
Lecturer
Biological Sciences
University of New Hampshire
janet.anderson@unh.edu

Sierra Barton

EDUCATION

BS in Wildlife and Conservation and Biology with a minor in Animal Behavior
from The University of New Hampshire

August 2018- May 2022

SKILLS AND COURSEWORK

Field Skills:

- Identification and classification of tree and shrub species
- Observe/record/report field data
- Perform Diameter at Breast Height and Tree Basal Area measurements

Lab Skills:

- ArcGIS
- Analyze and interpret results
- Microscopy
- Spectrophotometry

Additional Skills:

- Microsoft Office
- Customer Service
- Communication
- Leadership

Coursework:

- GIS
- Chemistry
- Biology
- Dendrology
- Forest and Wildlife Ecology
- Animal Agriculture



PROFESSIONAL EXPERIENCE

Cianbro, Portsmouth Naval Shipyard, Kittery, ME

October 2022, Present

Marine Mammal Monitor

- Report animal sightings effectively and accurately
- Identify and document marine mammal sightings
- Communicate sightings to other observers
- Report animal sightings effectively and accurately
- Maintain required logs

Barrio, Portsmouth, NH

January 2022, September 2022

Hostess/Server

- Welcome guests in a friendly and helpful manner
- Manage seating sections and seat customers
- Respond to guests' questions in a timely manner
- Serving customers with friendly service during peak times with high volume
- Memorize food and drink menus, as well as weekly specials
- Take food and drink orders and respond to special requests from customers

The Goat, Portsmouth, NH.

August 2021- November 2021

Hostess/Server

- Welcome guests in a friendly and helpful manner
- Manage seating sections and seat customers
- Respond to guests' questions in a timely manner
- Serving customers with friendly service during peak times with high volume
- Memorize food and drink menus, as well as weekly specials
- Take food and drink orders and respond to special requests from customers

Aroma Joes, Newmarket, NH

May 2019-August 2021

Barista

- Collaborate with other employees to deliver friendly customer service during peak times with high volume
- Prepare sandwiches, baked good, specialty coffees and teas and served customers while paying attention to detail ensuring positive customer experience
- Maintain sanitary workstation using appropriate hygiene protocol

Kingston Recreation, Kingston, NH

Summer 2018, and 2019

Summer Camp Counselor

- Work along with other counselors to execute activities and field trips for campers including trampoline parks, bowling, water parks, etc.
- Led campers between the ages of 4 and 12 in activities such as basketball, soccer, painting, talent shows, bracelet making, and more
- Enforce camp rules and appropriately work with campers who violate them



Amesbury Animal Hospital, Amesbury, MA

October 2017- April 2018


Intern

- Assisted customers and patients at front desk: weighed pets, prepared paperwork for vets
- Observed surgeries on spays, neuters, euthanizing, and various dental procedures; recorded data from patient monitors during procedures as regulated by vet
- Sanitized surgical and dental equipment following standard hygiene protocol

Dunkin' Donuts, Kingston, NH

June 2016-May 2018

Crew Member

- Collaborated with other employees to deliver friendly customer service during peak times with high volume
 - Trained several new employees on proper protocols, operation, and maintenance of equipment as well as how to appropriately handle the cash register
 - Maintained sanitary workstation using appropriate hygiene protocol
- 

Amanda Colombo

(207)-468-6536 | AmandaColombo94@gmail.com

EDUCATION

University of Rhode Island – North Kingstown, RI

Non-Degree Graduate Work – Biology, Evolution

May 2021

Pennsylvania State University - Altoona, PA

Bachelor of Science - Biology, Concentration in Ecology

May 2019

Monroe Woodbury High School - Central Valley, NY

High School Diploma

June 2012

RELATED EXPERIENCE

Kiewit

Environmental Manager – Portsmouth Naval Shipyard, Kittery, ME

November 2022 – Present

- Lead the environmental compliance for the project
- Identify assess and reduce environmental risks to the company
- Update environmental plans
- Perform and oversee field inspections and monitoring (water quality, underwater noise, marine mammal monitoring)
- Maintain project data tracking requirements
- Monitor, forecast and communicate environmental costs at the project level
- Develop and conduct environmental protection and awareness training to staff at all levels
- Function as a principal technical advisor and coordinator for environmental issues
- Coordinate with relevant crews on their work locations, material needs, quantities, and invoices

Maine Audubon

Shorebird Biologist – Falmouth, ME

April 2022 – July 2022

- Conduct 20+ surveys per week
- Manage 6 beaches (Kennebunkport to Old Orchard) in southern Maine
- Identify and document marine mammal sightings
- Observe endangered and protected bird species with binoculars for long periods of time
- Supervise and train project biotechnicians, interns, volunteers, public works departments and elected town/city officials
- Engage in applied research partnerships
- Superior understanding of the ESA and Migratory Birds Treaty Act regarding Piping plovers and Least Terns
- Point of contact on behalf of Maine Audubon in the coordination and collaboration of volunteers and stakeholders
- Determine management needs for birds depending on predators, nest location and adult piping plover behavior
- Track nest and fledgling success
- Negotiating and implementing management agreements with both private and public landowners
- Chair, facilitate and conduct meetings and trainings with diverse stakeholder work groups

Rhode Island Department of Environmental Management

AIS and Water Quality Monitoring Intern | Office of Water Resources – Providence, RI

June 2020 – Nov 2021

- Execute 80+ surveys at unique locations (lakes/ponds/rivers) identifying and tracking aquatic invasive species
- Perform ambient river monitoring and testing (DO, SPC, Temperature, Barometric pressure, metals, Bacterial loads)
- Complete field reports for each survey; manage digital files, input data in Access database, perform QA/QC activities
- Compile, analyze and interpret complex sets of data for technical reports
- Sample for macroinvertebrates to determine stream health
- Conduct stream habitat assessments
- Coordinate with RI Department of Health to deliver cyanobacteria, metals, and bacterial samples
- Use Google Earth and GIS mapping to quantify yearly growth of invasive species
- Plan, coordinate and implement statewide planning to manage existing and new threats
- Develop strategies to prevent spread and remediate existing threats from aquatic invasive species
- Create and distribute outreach to increase public awareness and promote responsible actions by the public

Amanda Colombo

(207)-468-6536 | AmandaColombo94@gmail.com

Naturalist | Division of Parks and Recreation – Narragansett, RI

April 2020 – June 2020

- Conduct public education programs regarding animal life and behavior, natural resources, and conservation
- Understand and identify New England ecosystems and wildlife with a focus in Narragansett Bay
- Develop and implement environmental education classes for children and adults during a global pandemic
- Confer with Regional Manager to determine subjects and schedules for park programs
- Provide visitor services, explain regulations, answer visitor requests, needs and complaints
- Provide information about the park and surrounding areas
- Perform emergency duties to protect human life, government property, and natural features of the park
- Inspect facilities for maintenance problems and equipment failures; perform variety of maintenance tasks

Student Conservation Association | PA Department of Conservation and Natural Resources – Williamsport, PA

Crew Leader

February 2018 – August 2018

- Lead a 10-person crew to perform trail and park maintenance, build new trail and invasive plant management
- Restore river and lakefront environments, conserve and restore habitats, carry out vegetative management plans
- Take inventory, distribute and maintain equipment and supplies
- Perform regular safety checks and teach members proper tool handling and maintenance
- Prepare and apply herbicides to invasive plants
- Develop and implement strategies to enhance team performance
- Conduct learning seminars which teach crew members about the environment, diversity, equity, and inclusion
- File daily paperwork on crew productiveness, safety, and accomplishments
- Manage monthly budgets, file expense reports, and make purchases for the crew as needed
- Assist in data recording and logistical planning
- Perform construction and equipment maintenance, operate heavy machinery as needed
- Consult with conservation, state and park management about projects and collaborate on management plans
- Give back to the community through service projects

VOLUNTEER WORK

Volunteer: Blackstone River Watershed Water Chestnut Pull – Pawtucket, RI

June 2022

Board Member: Wood-Pawcatuck Watershed Association – Hope Valley, RI

January 2021 – April 2022

- Water Quality Committee Chairwoman
- Serve on the marketing committee and the general board

OTHER EXPERIENCE

Ed Tech III: South Portland High School – South Portland, ME

September 2022 – Present

Catering Sales Assistant, Banquet Captain: Falkirk Estate – Central Valley, NY

May 2016 – March 2020

Bartender: Hugh O’Connors Irish Bar and Restaurant – Houston, TX

May 2019 – December 2019

Residence Assistant: Pennsylvania State University | Residence Life – Altoona, PA

August 2016 – May 2017

Research Assistant: Pennsylvania State University | Biology Department – Altoona, PA August 2013 – August 2015

SKILLS

Microsoft Office (Word, Excel, Access, Teams)
Statistical Analyses (R Statistical Package, Minitab, SPSS)
Report Preparation and Writing
Conflict Management and Resolution
Field Research Data Collection & Analysis
Navigation and GPS Data Collection
Adobe Acrobat

Mapping (Google Earth, ArcGIS)
Water & Soil Quality Analyses
Data Entry and Quality Assurance
Community Outreach and Education
Project Management

Amanda Colombo

(207)-468-6536 | AmandaColombo94@gmail.com

CERTIFICATIONS

Rhode Island Boating License – *State of Rhode Island*

U.S. EPA Water Quality Standards and Criteria: Key Concepts

First Aid/ CPR/ AED – *American Red Cross*

Safe Zone Certified – *The Safe Zone Project*

Issued June 2020 – Does Not Expire

Issued June 2020 – Does Not Expire

Issued May 2018 – Expired May 2020

Issued August 2016 – Does Not Expire

Amanda Colombo

(207)-468-6536 | AmandaColombo94@gmail.com

REFERENCES

Katie DeGoosh-DiMarzio

NEIWPC Environmental Analyst

Katie.degoosh@dem.ri.gov

(401)-575-7484

Heidi Travers

Environmental Engineer IV

Heidi.travers@dem.ri.gov

(401)-742-4792

Matt Pecora

Park Manager at Pennsylvania Department of Conservation and Natural Resources

mpecora@pa.gov

(585)-752-8553

Morgan Andrews

Education

Maine Maritime Academy
2013 -2017

B.S Marine Biology and Small
Vessel Operations
Minor International Business and
Logistics

Certifications

- Protected Species Observer
(December 2020)
- 200T Near Coastal Mate's
USCG License (June 2018)
- National Marine Fisheries
Service Domestic Observer
(February 2019)
- National Marine Fisheries
Service High Volume,
Pot&Trap Fisheries
(November 2019)
- CPR, AED, Basic First Aid
(January 2018)
- Merchant Mariner Credential
(May 2017)
- Unlimited Radar Observer
(May 2017)
- Vessel Personnel with
Designated Security Duties
(April 2017)
- USCG Transportation Worker
Identification Credential
(September 2016)
- Shipboard Fire Fighting
(May 2014)
- Basic SCUBA, Advanced
SCUBA, Rescue SCUBA
(May 2014-Dec 2016)

Experience

September 2020 – Present

Protected Species Observer • Cianbro • Portsmouth Naval Shipyard

- Keeping watch from sunset to sundown of pinnipeds and other various marine mammals during pile driving and drilling construction activity on the Portsmouth Naval Shipyard
- Filling out daily logs
- Special civilian clearance on the shipyard and in the CIA zone

January 2018 – September 2020

At-Sea-Monitor and NEFOP Observer • AIS Inc

- Working alone on fishing vessels to collect discard and kept catch data for NOAA and the US Fisheries Department
- Conducting safety checks on each vessel before deployments (EPIRB, life raft, immersion suits, flares, etc.)
- Collecting weights, length frequencies and biological samples from various fish species- as well as incidental takes of marine mammals and birds
- Filling out copious logs and data entry on a tablet
- Living on various fishing vessels for up to 2 weeks at a time
- On call daily for possible deployments all around New England
- Talking to a NOAA debriefer on the phone to discuss data
- Carrying +80lbs of gear to and from vessels

May 2018 – January 2019

Oyster Aquaculture Technician • Muscongus Bay Aquaculture Inc

- Sorting and packing oysters according in different size 'grades'
- Bagging seed and re-planting in various lease sites
- Consistent heavy lifting of +50lbs, and long days standing
- Working both alone and with a small team
- Occasionally operating a Carolina skiff

January 2018- May 2018

Deckhand • Lindblad Expeditions/National Geographic

- Living onboard a small cruise ship, the *Quest*
- Working 12 hour shifts, 7 days a week, with only 1 day off a month
- Conducting daily night watches
- Keeping up daily maintenance of the vessel
- Driving passengers in a Zodiac outboard
- Insuring the safety of passengers and fulfillment of Coast Guard regulations
- Operating a crane

May 2017- September 2017

Deckhand • Casco Bay Lines Ferry Services

- Tossing lines onto bollards and making up a cleat multiple times a day
- Organizing cargo onboard and delivering it to different islands, with time restraints
- Conducting fog watches and safety rounds
- Operating a crane and forklift

September 2014 – December 2017

Social Media Associate/Photographer • Maine Maritime Academy

- Taking photographs for the website and social media pages
- Admin for MMA's Instagram page

Attachment D

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

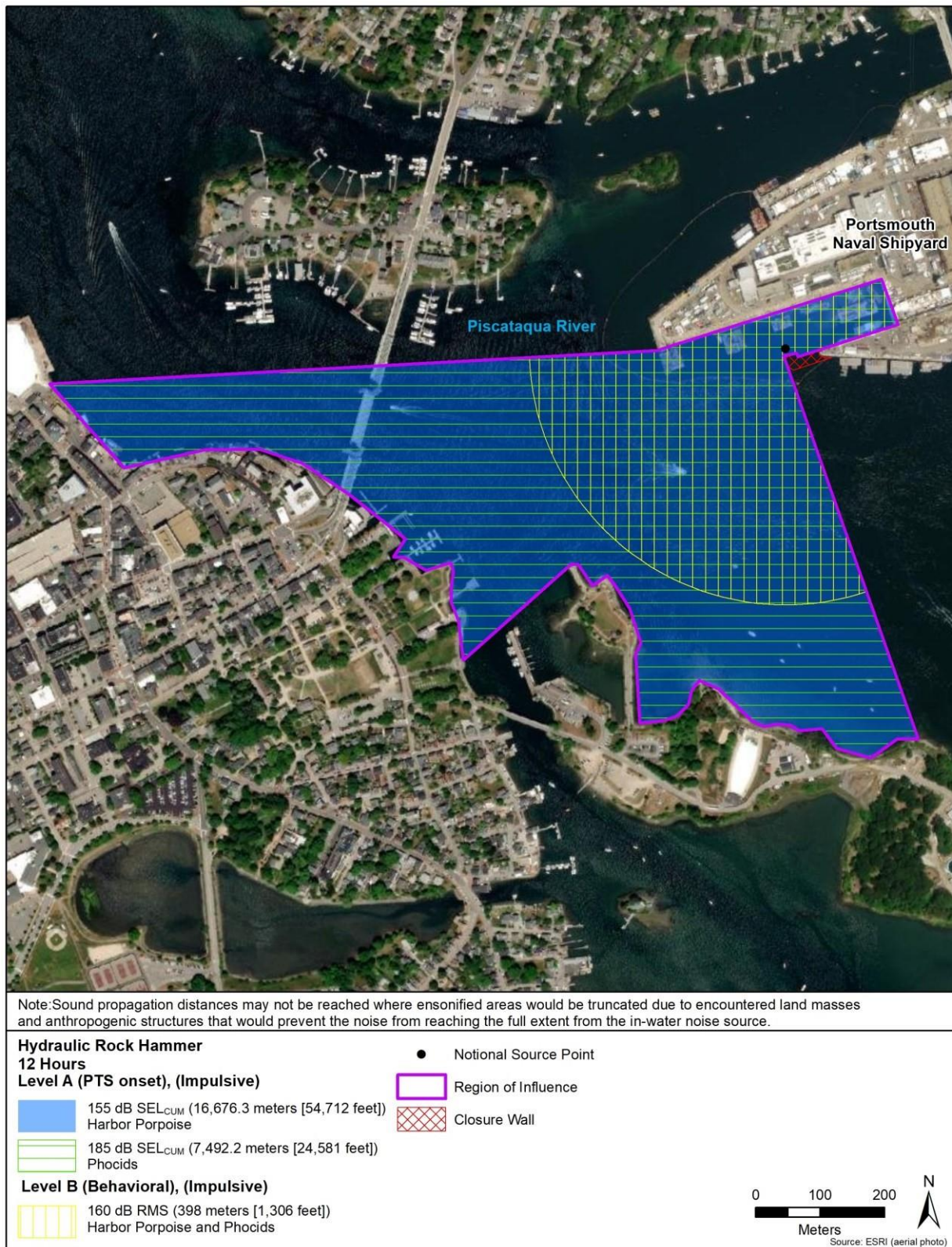


Figure 6-1 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Rock Hammering 12 Hours/Day

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

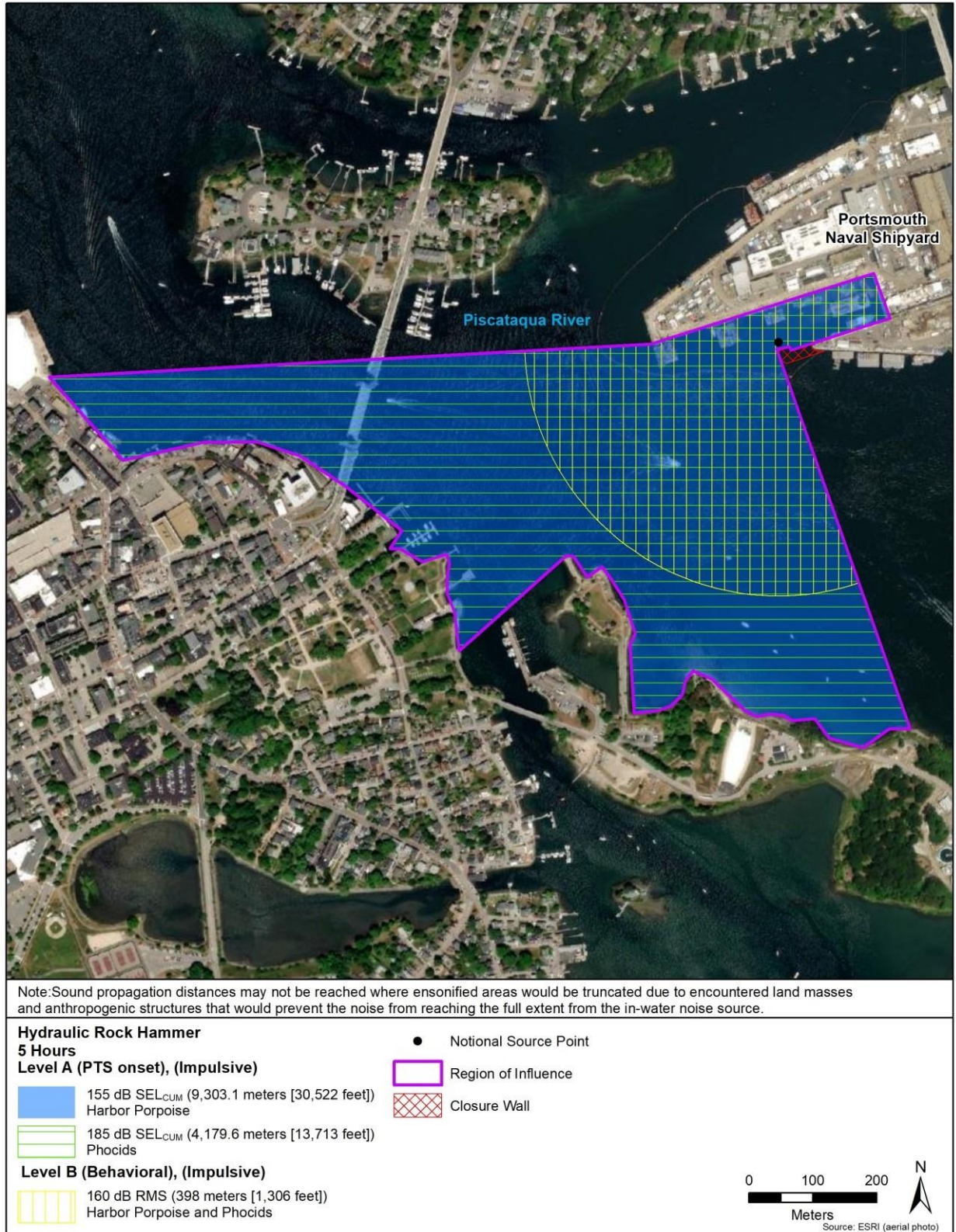


Figure 6-2 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Rock Hammering 5 Hours/Day

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

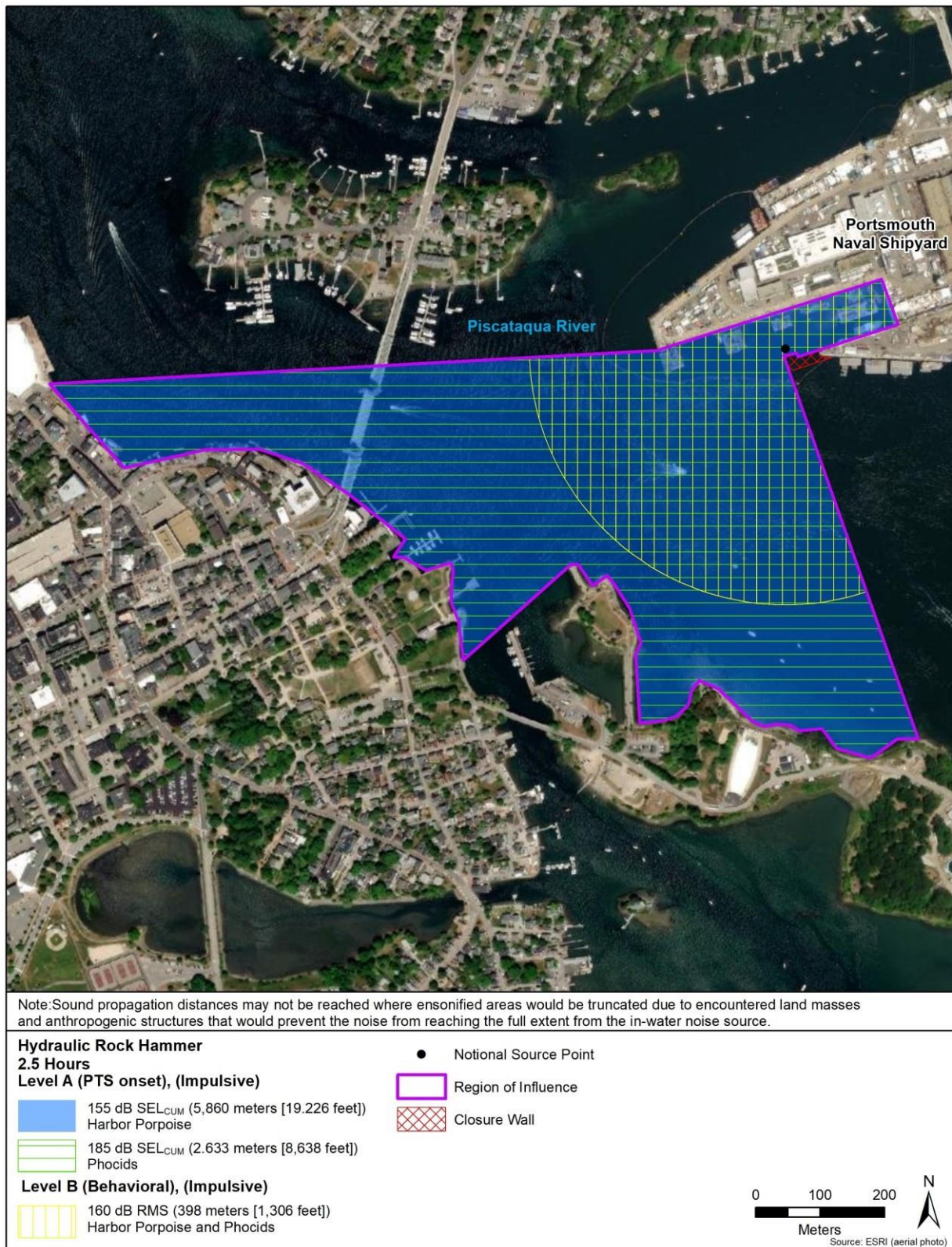


Figure 6-3 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Rock Hammering 2.5 Hours/Day

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

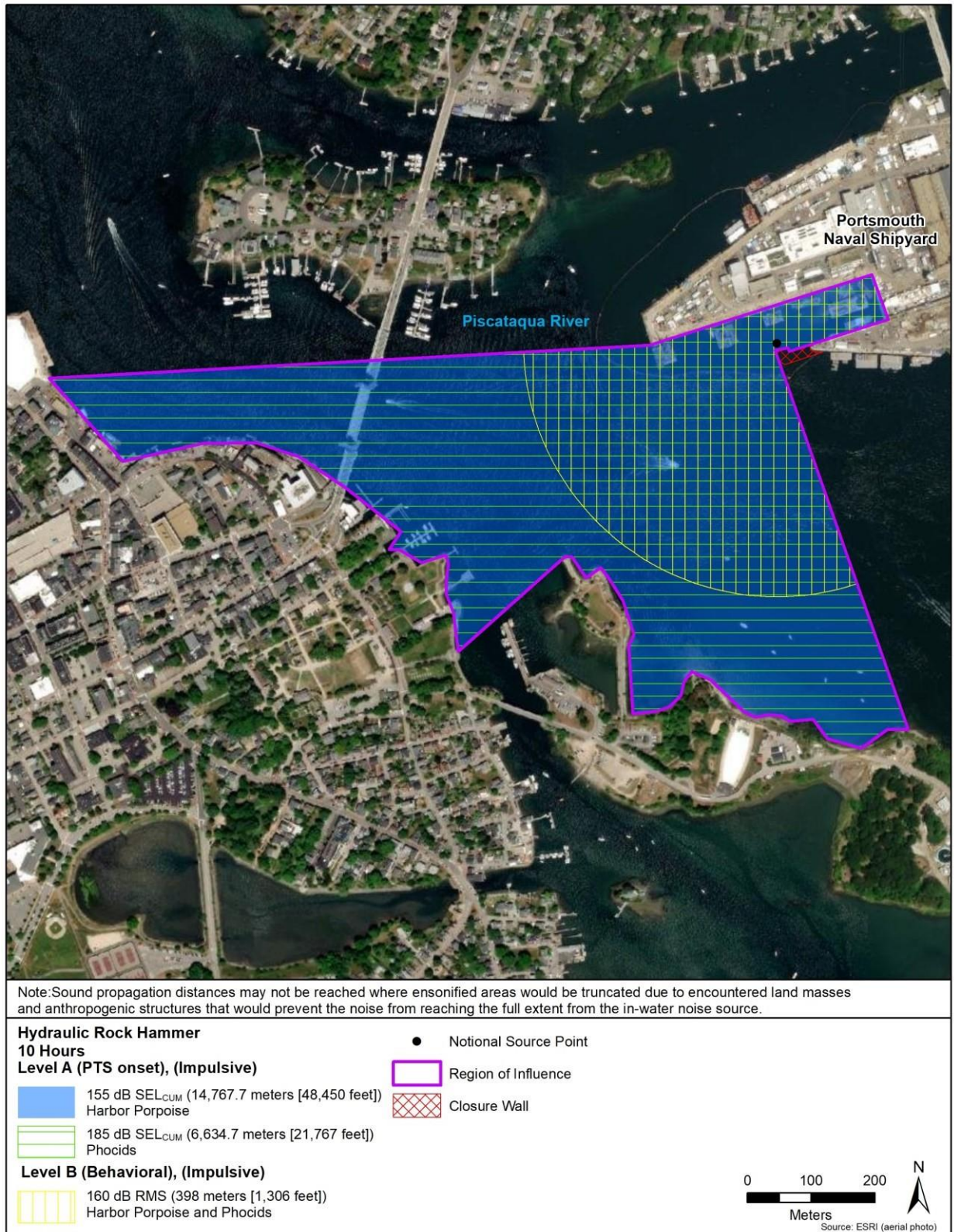


Figure 6-4 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Rock Hammering 10 Hours/Day

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

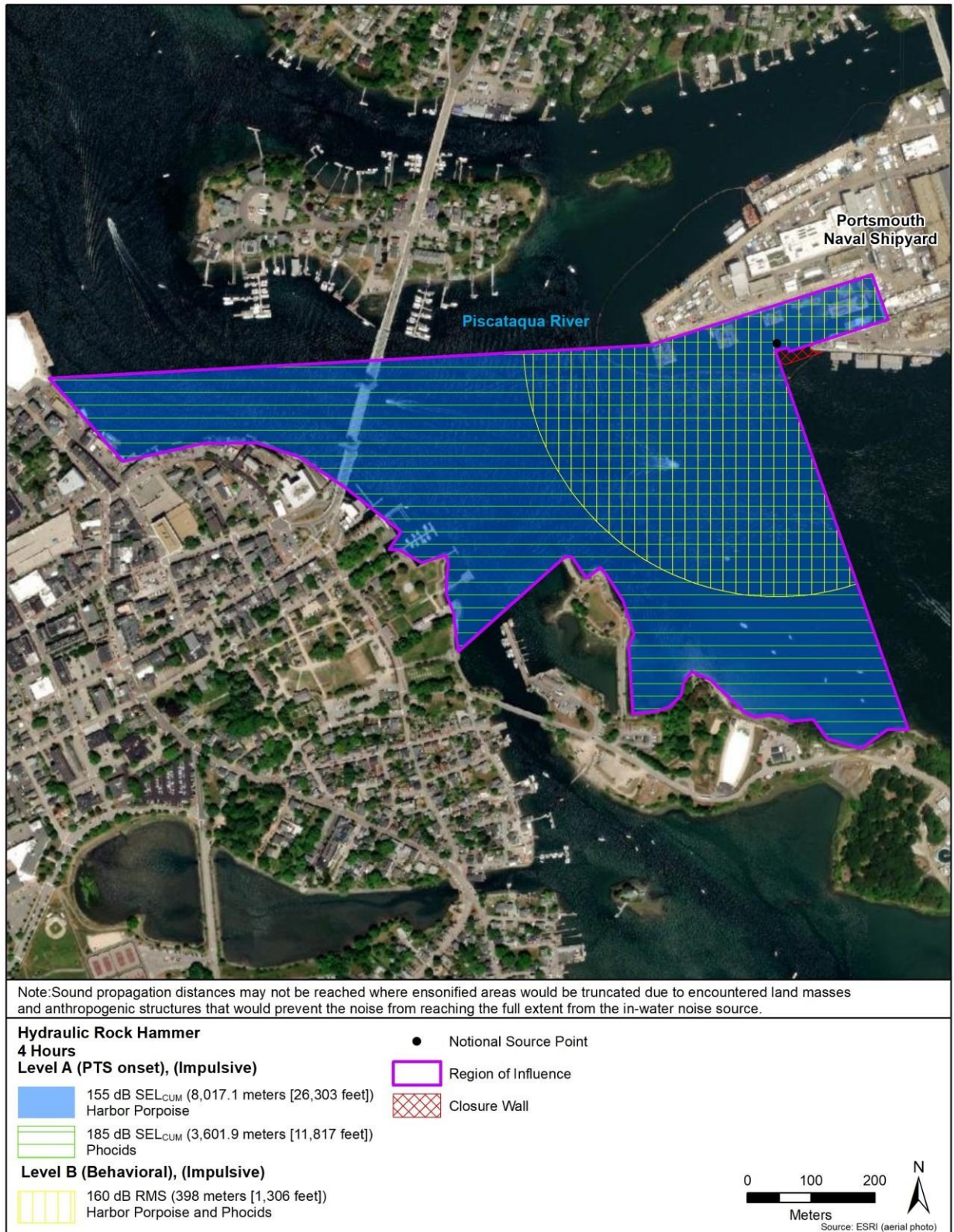


Figure 6-5 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Rock Hammering 4 Hours/Day

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

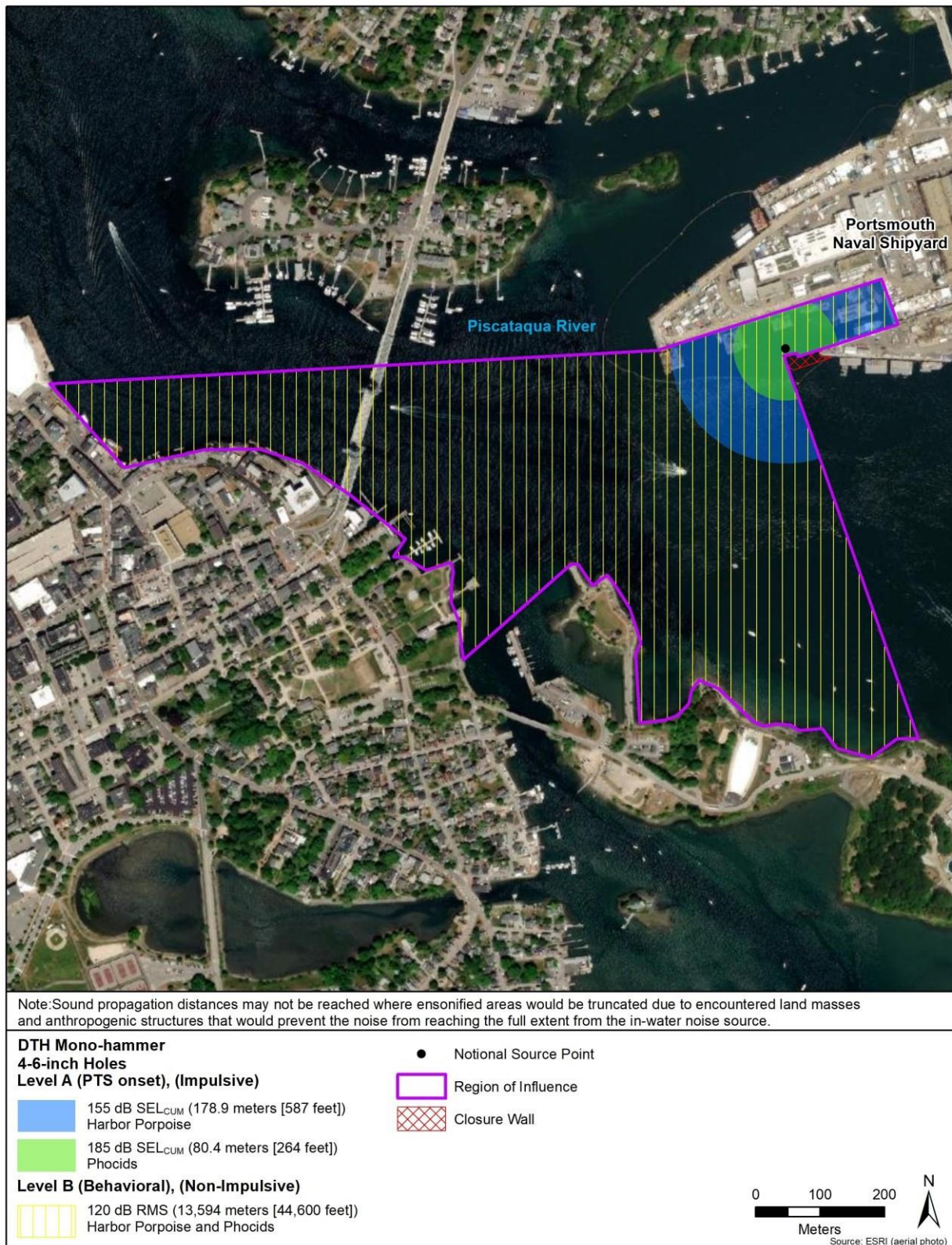


Figure 6-6 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Underwater Noise from DTH Mono-hammer for 4-6 inch Relief Holes

Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard

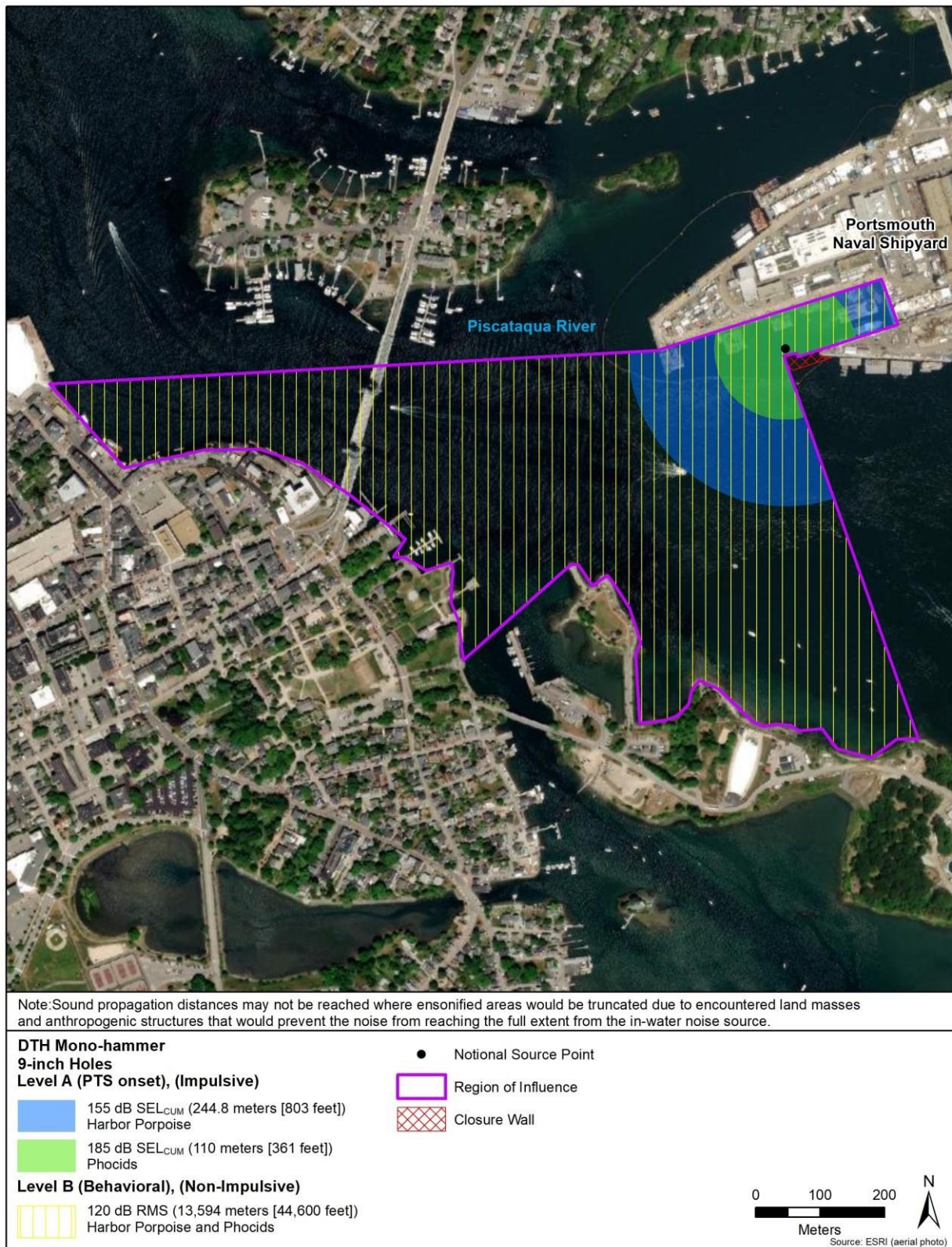


Figure 6-7 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Underwater Noise from DTH Mono-hammer for 9-inch Rock Anchors

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

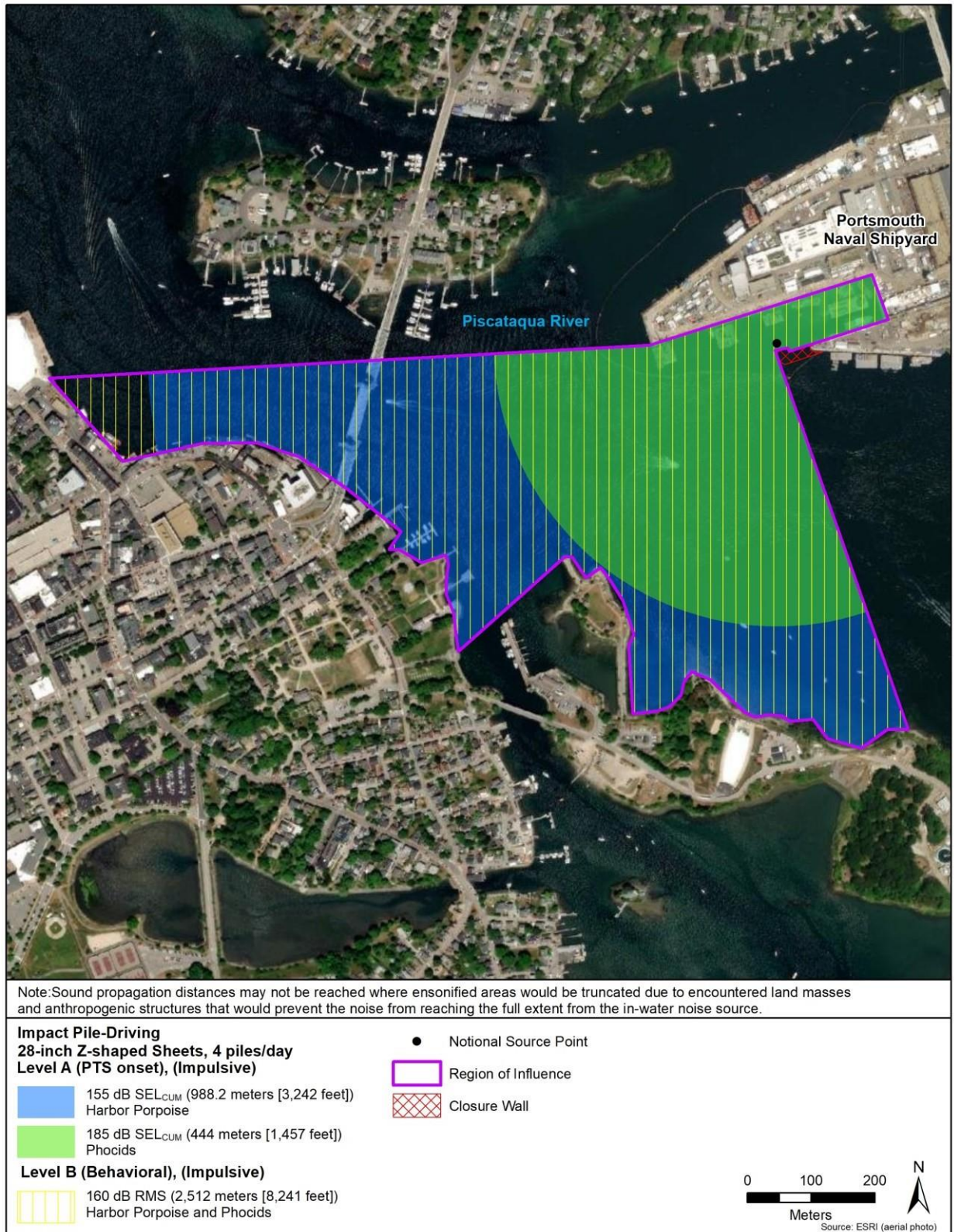


Figure 6-8 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Underwater Noise from Impact Pile Driving 28-inch Sheet Piles, 4 Piles/Day

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

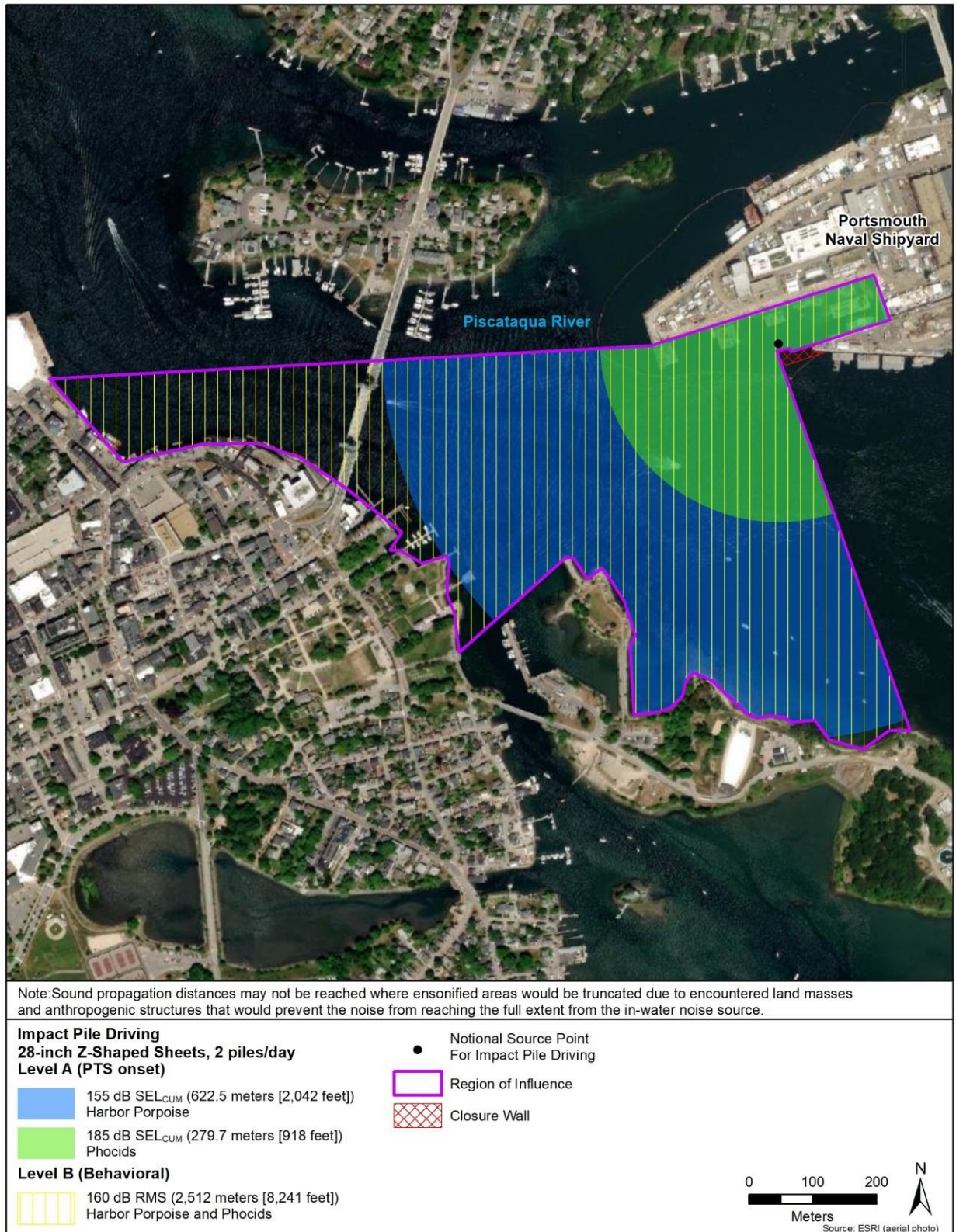


Figure 6-9 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Underwater Noise from Impact Pile Driving 28-inch Sheet Piles, 2 Piles/Day

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

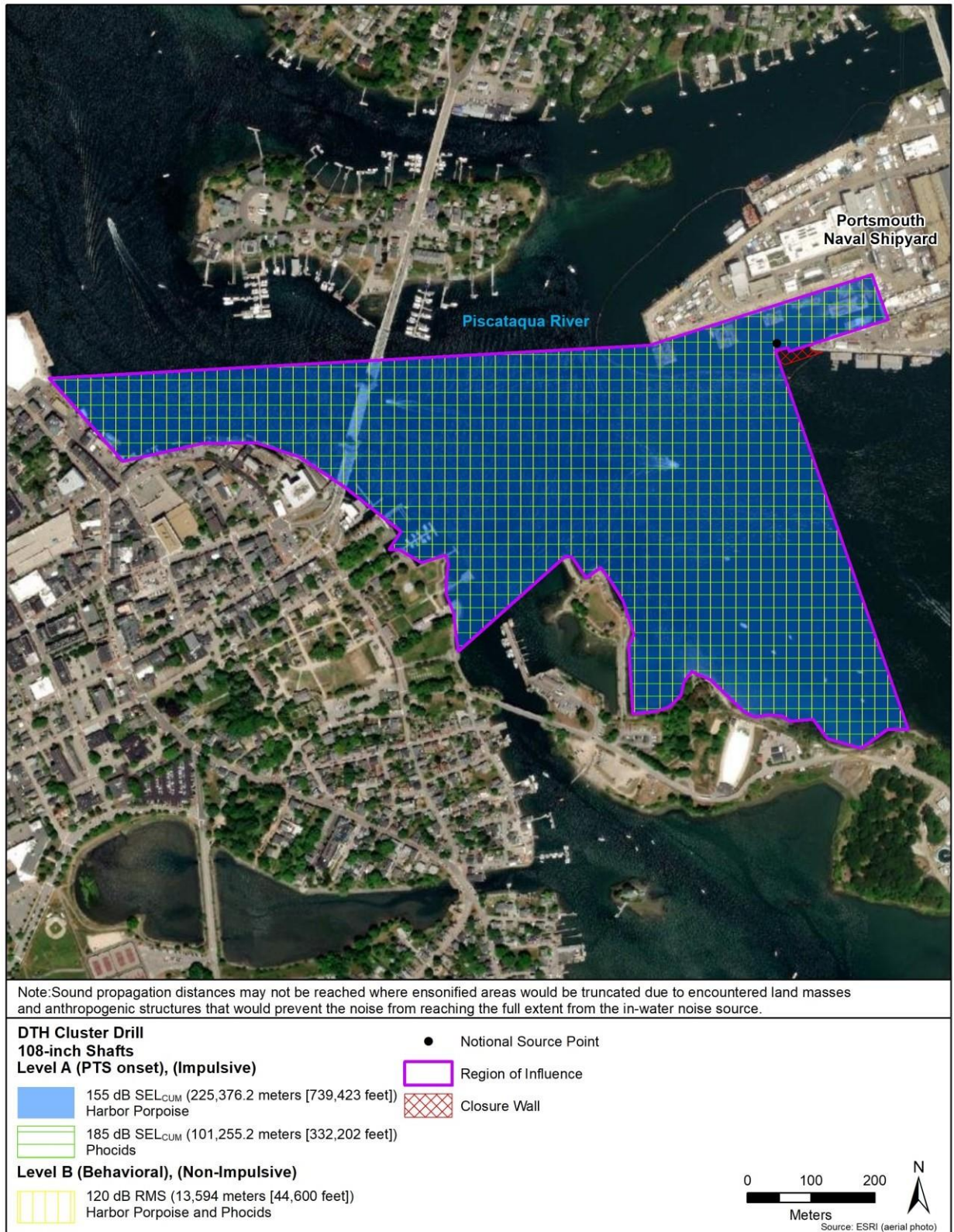


Figure 6-10 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Underwater Noise from 108-inch Cluster Drill

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

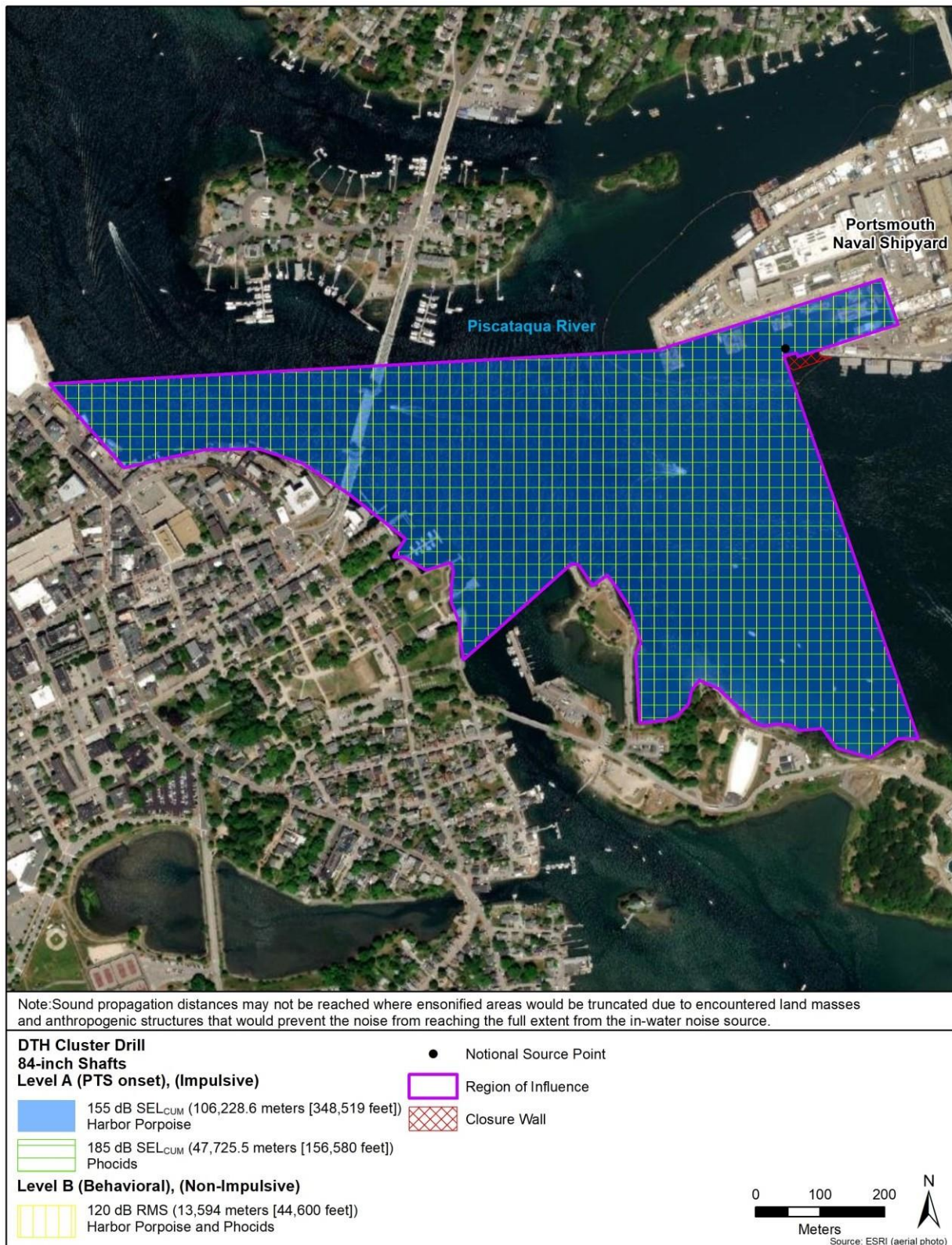


Figure 6-11 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Underwater Noise from 84-inch Cluster Drill

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

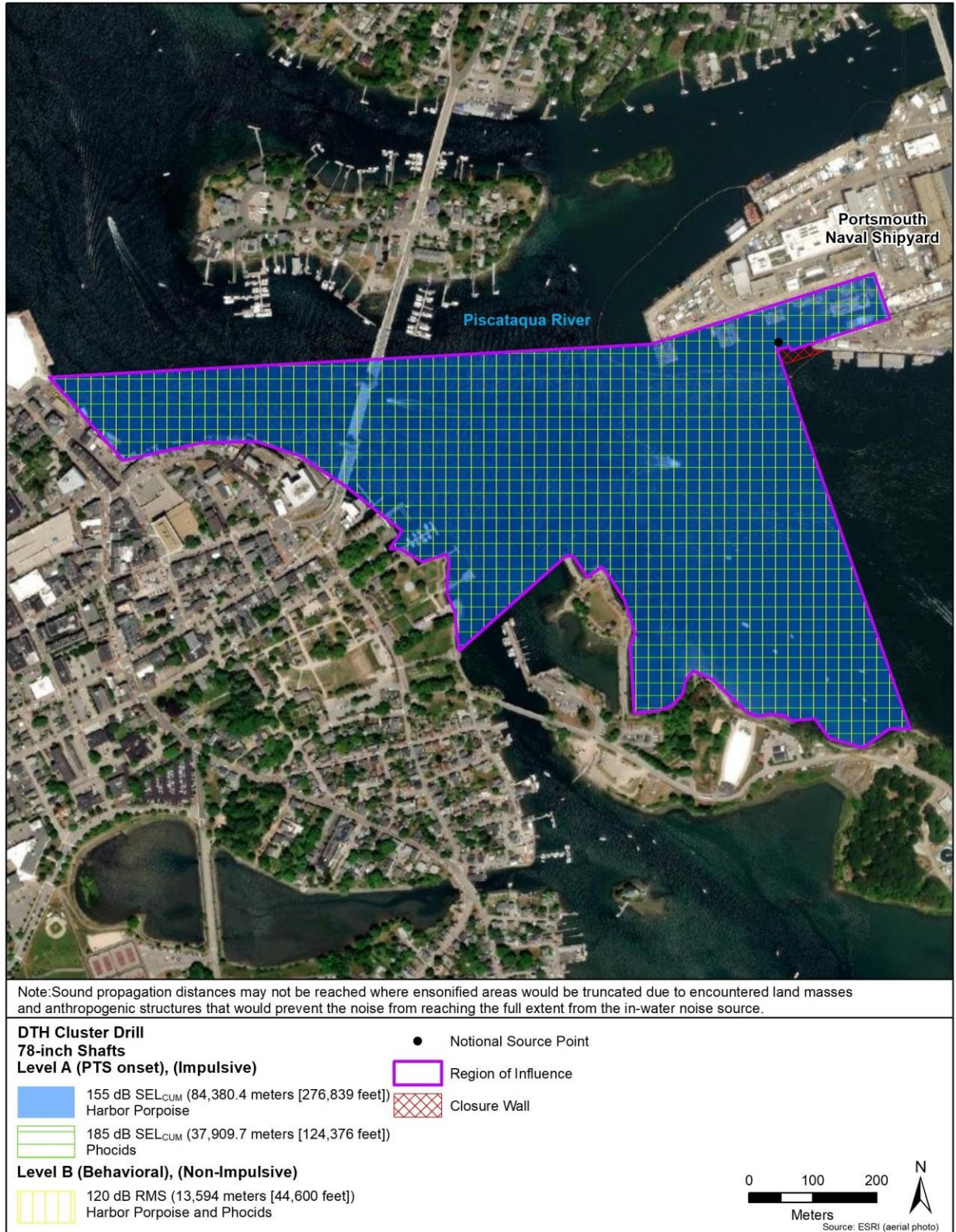


Figure 6-12 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Underwater Noise from 78-inch Cluster Drill

**Request for Letter of Authorization for
Multifunctional Expansion of Dry Dock 1 at Portsmouth Naval Shipyard**

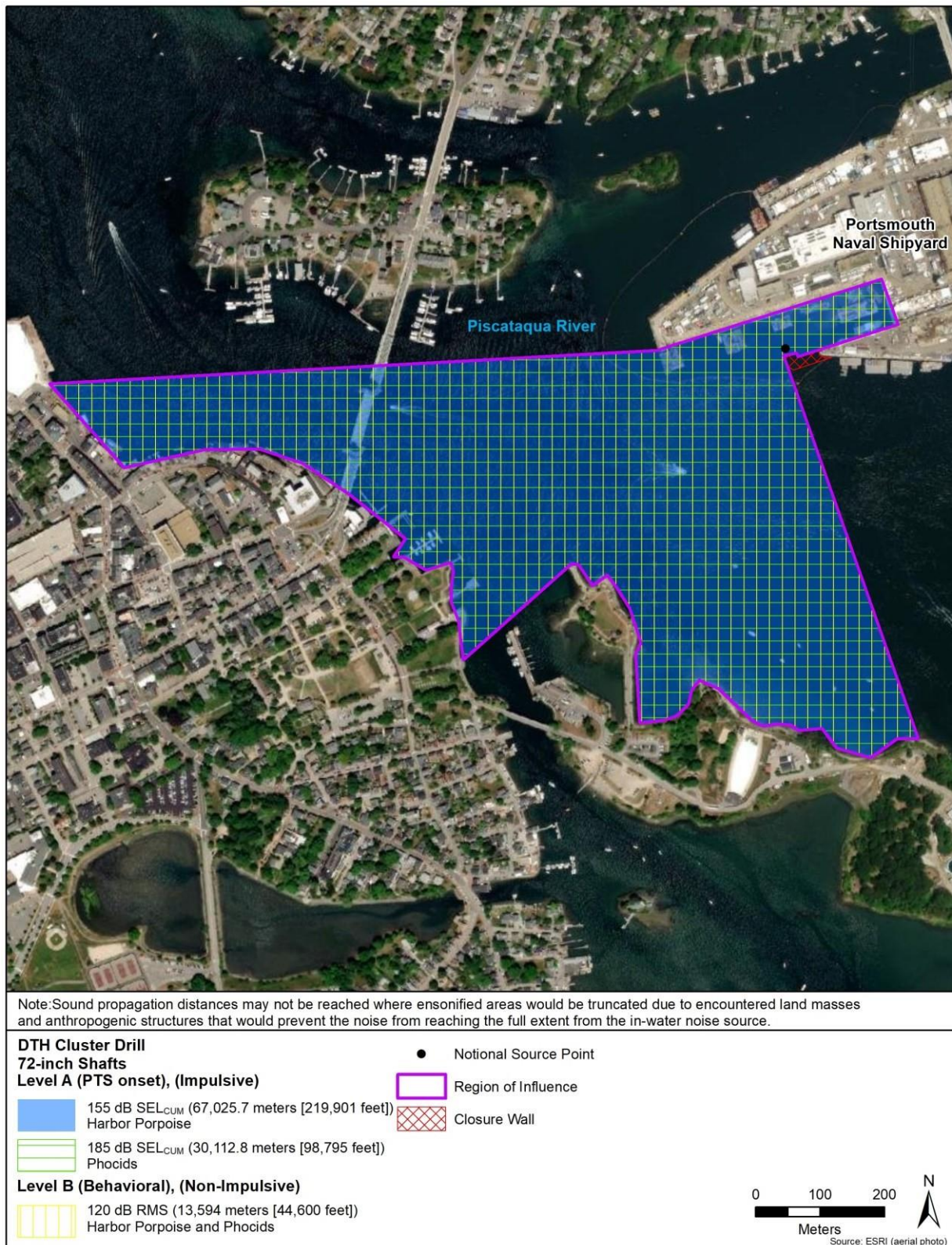


Figure 6-13 Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones due to Underwater Noise from 72-inch Cluster Drill

Attachment E

In-Water Noise Generating Work Daily Report

Crew:

Date:

Shaft Name(s):

Drill/Hammer:

Rotary

Vibratory

Impact

Mono

Cluster

Rock Hammer

Pile Type:

102"

42"

78"

28"

9"

N/A

4-6"

Other: _____

Installed

Removed

Soft Start: Yes / No / NA

Bubble Curtain: Yes / No / NA

Drilling Times:

Start: _____

Stop: _____

Start: _____

Stop: _____

Start: _____

Stop: _____

Start: _____

Stop: _____

Start: _____

Stop: _____

Start: _____

Stop: _____

Start: _____

Stop: _____

Start: _____

Stop: _____

Start: _____

Stop: _____

Start: _____

Stop: _____

Notes:

Shutdown(s):

Start: _____

Stop: _____

Start: _____

Stop: _____

Start: _____

Stop: _____

Notes:

Comments: