



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Silver Spring, MD 20910

## INCIDENTAL HARASSMENT AUTHORIZATION

The City of San Diego Transportation and Storm Water Department, 9370 Chesapeake Drive, San Diego, CA 92123, is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1371(a)(5)(D)), to harass small numbers of marine mammals incidental to the sand quality study activities at the Children's Pool Beach in LaJolla, California, when adhering to the following terms and conditions:

1. This Authorization is valid from June 1, 2016 through May 30, 2017.
2. This Authorization is valid only for the sand sampling activities at the Children's Pool Beach at 850 Coast Boulevard, La Jolla California 92037 (32° 50'51.18"North, 117° 16'41.94"West), as specified in the City of San Diego's IHA application.
3. General Conditions
  - (a) The City of San Diego must ensure that the requirements of this IHA and the monitoring plan are explained to all workers involved in sand quality study activities at Children's Pool Beach, and that a copy of the IHA is provided to all workers and posted in a prominent location at the site.
  - (b) The incidental taking of marine mammals, by Level B harassment only, is limited to the pinniped species enumerated in Table 1 (attached) in the Children's Pool Beach, La Jolla, California area.
    - (i) If any marine mammal species are encountered during sand sampling activities that are not listed in Table 1 (attached) and are likely to be taken by the sand quality study activities, then the City of San Diego must shut-down operations to avoid take.
    - (ii) The taking by injury (Level A harassment), serious injury, or death of any of the species listed in Condition 3(b)(i) above, or the taking of any kind of any other species of marine mammal, is prohibited and may result in the modification, suspension or revocation of this Authorization.
  - (c) The methods authorized for taking by Level B harassment are limited to visual stimuli associated with sand sampling activities (walking beach transects, taking sand surface samples, and taking subsurface samples, including hammering core samples with a rubber mallet) without an amendment to this Authorization.



- (d) The taking of any marine mammal in a manner prohibited under this Authorization must be reported immediately to the Office of Protected Resources, National Marine Fisheries Service (NMFS), at 301-427-8401.

#### 4. Mitigation Measures

The City of San Diego is required to implement the following mitigation and monitoring requirements when conducting the specified activities:

- (a) The sand sampling activities shall be prohibited between December 15, 2015 and May 31, 2016, and shall be prohibited after December 14, 2016.
- (b) Sand sampling activities shall be conducted during daylight hours only from approximately 8:30 a.m. to 3:30 p.m.; however, sand sampling activities may be extended from 7 a.m. to 7 p.m. (*i.e.*, daylight hours) if required due to extenuating circumstances and if fewer than the average number of seals are hauled out on Children's Pool Beach.
- (c) A trained Protected Species Observer (PSO) shall attend the project site 30 minutes prior until 30 minutes after sand sampling activities cease each day throughout the sand quality study window. The PSO shall be approved by NMFS prior to commencement of activities. The PSO shall search for marine mammals using binoculars and/or the naked eye within the study area. The PSO will observe from a station along the breakwater wall (weather permitting) as well as the base of the cliff. PSOs will follow procedures and will be responsible for following the Monitoring Plan (attached).

#### 5. Monitoring

- (a) In the event that fur seals are observed either on the rocks, beach, or in the water at Children's Pool Beach prior to commencement of sand collection activities, these activities will be postponed until coordination with the stranding network is complete (including any potential 24-hour or 48-hour wait/observation period) and/or the animal either leaves, or is collected by the stranding network.
- (b) The PSO shall use visual digital recordings and photographs to document individuals and behavioral responses to the sand sampling activities. The PSO shall make hourly counts of the number of pinnipeds present and record events that result in behavioral responses and changes, whether due to sand sampling activities or from public stimuli. During these events, pictures and videos will be taken when possible to document individuals and behavioral responses.
- (c) A PSO shall record the following information when a marine mammal is sighted:
  - (a) Species, group size, age/size/sex categories (if determinable), behavior when first sighted and after initial sighting, heading (if consistent), distribution, bearing and

distance relative to the sampling technicians (stimuli), group cohesiveness, duration of presence, apparent reaction to sand sampling activities (*e.g.*, none, avoidance, approach, etc.), direction and speed of travel, duration of presence, and if there are other causes of potential disturbance occurring. NMFS will consider pinnipeds flushing into the water; moving more than twice their body length, but not into the water; and changing direction of current movement by individuals as behavioral criteria for take by Level B harassment;

(i) Date, time, location, sand sampling activity (walking; surface sampling; subsurface sampling [hammering], etc), monitoring and mitigation measures implemented (or not implemented), tidal stage, weather conditions, Beaufort sea state, wind speed, visibility, and sun glare; and

(ii) The data listed under Condition 5(c)(ii) shall also be recorded at the start and end of each observation watch and during a watch whenever there is a change in one or more variables.

(d) A PSO shall also record the time of arrival and departure on site, commencement and cessation of sand sampling activities, and presence of humans on the beach. Whenever possible, the PSO should determine as to whether or not the harassment of pinnipeds is attributable to the sand sampling activities and/or the presence of the public on the beach and around the Children's Pool area. A PSO shall record the number of people on the beach and surrounding areas as well as their location relative to the animals.

(e) Buffer zones shall be established such that sand sampling technicians will remain at least three meters from any hauled out pinniped at all times.

6. Reporting:

The City of San Diego is required to:

(b) Submit a draft report on all activities and monitoring results to the Office of Protected Resources, NMFS, within 90 days of the completion of the sand sampling activities at the Children's Pool Beach. This report must contain and summarize the monitoring information gathered in 5(a)-(e), above and a description of the implementation and effectiveness of the monitoring and mitigation measures of the IHA.

(c) Submit a final report to the Chief, Permits and Conservation Division, Office of Protected Resources, NMFS, within 30 days after receiving comments from NMFS on the draft report. If NMFS decides that the draft report needs no comments, the draft report shall be considered to be the final report.

(f) Reporting injured or dead marine mammals:

(i) In the unanticipated event that the City of San Diego discovers a live stranded marine mammal (sick and/or injured, or if any fur seals are observed) at Children's Pool, they shall immediately contact Sea World's stranded animal hotline at 1-800-541-7235. Sea World shall also be notified for dead stranded pinnipeds so that a necropsy can be performed. In all cases, the NMFS stranding coordinator shall be notified as well, but for immediate responses purposes, Sea World shall be contacted first.

(ii) In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this Authorization, such as an injury (Level A harassment), serious injury or mortality, or if there is any take of an unauthorized species, the City of San Diego shall immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS and the West Coast Regional Stranding Coordinator. The report must include the following information:

A. Time, date, and location (latitude/longitude) of the incident; the type of activity involved; description of the circumstances during and leading up to the incident; water depth; environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility); description of marine mammal observations in the 24 hours preceding the incident; species identification or description of the animal(s) involved; the fate of the animal(s); and photographs or video footage of the animal (if equipment is available).

B. Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with the City of San Diego to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The City of San Diego may not resume their activities until notified by NMFS via letter or e-mail, or via telephone.

(iii) In the event that the City of San Diego discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (i.e., in less than a moderate state of decomposition as described in the next paragraph), the City of San Diego will immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS and the NMFS West Coast Regional Office and/or the West Coast Regional Stranding Coordinator. The report must include the same information identified in the Condition 8(a) above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with the City of San Diego to determine whether modifications in the activities are appropriate.

(iv) In the event that the City of San Diego discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in Condition 2 to 4 of this Authorization (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the City of San Diego shall report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS and the NMFS West Coast Regional Office and/or the West Coast Regional Stranding Coordinator within 24 hours of the discovery. The City of San Diego shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. Activities may continue while NMFS reviews the circumstances of the incident.

(v) In the event that the City of San Diego discovers any fur seals hauled out on the rocks or in sand at Children's Pool Beach prior to commencing sand sampling activities for the day, the City of San Diego shall contact the West Coast Regional Stranding Coordinator and sand sampling activities will not commence until the animal(s) either leave or are collected by the stranding network. The City will also report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS within 24 hours of the discovery. The City of San Diego shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. Activities may continue after the animal(s) are no longer present while NMFS reviews the circumstances of the incident.

7. This Authorization may be modified, suspended, or withdrawn if the holder fails to abide by the conditions prescribed herein, or if NMFS determines the authorization taking is having more than a negligible impact on the species or stock of affected marine mammals.

  
Donna S. Wieting,  
Director, Office of Protected Resources,  
National Marine Fisheries Service

MAY 27 2016

\_\_\_\_\_  
Date

Table 1. Species/stocks and numbers of marine mammals allowed under this IHA

| <b>Species</b>         | <b>Authorized Takes</b> |
|------------------------|-------------------------|
| Pacific harbor seal    | 3,040                   |
| California sea lion    | 320                     |
| Northern elephant seal | 16                      |

## **Monitoring Plan**



**DRAFT**  
**MONITORING PLAN FOR THE CHILDREN'S POOL**  
**FECAL INDICATOR BACTERIA AND MERCURY SAND STUDY**

**Submitted to:**  
**City of San Diego**  
**Transportation & Storm Water Department**  
**9370 Chesapeake Drive, Suite 100**  
**San Diego, California 92123**



**Submitted by:**  
**Amec Foster Wheeler Environment & Infrastructure, Inc.**  
**San Diego, California**

**February 2016**

**Amec Foster Wheeler Project No. 502515C027**



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City of San Diego  
Draft Monitoring Plan for the Children's Pool  
Fecal Indicator Bacteria and Mercury Sand Study  
Amec Foster Wheeler Project No. 502515C027  
February 2016

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## ACRONYMS AND ABBREVIATIONS

|                     |  |
|---------------------|--|
| °C                  | degrees Celsius  |
| µS/cm               | microsiemens per centimeter  |
| %                   | percent  |
| 303(d) List         | Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments  |
| AB                  | Assembly Bill  |
| Amec Foster Wheeler | Amec Foster Wheeler Environment & Infrastructure, Inc.   |
| AQUA                | Aquaculture  |
| Bacteria TMDL       | <i>A Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria Project I-Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)</i> |
| Basin Plan          | San Diego Region Basin Plan  |
| BIOL                | Preservation of Biological Habitats of Special Significance  |
| CDP                 | Coastal Development Permit   |
| City                | City of San Diego  |
| COC                 | chain of custody   |
| COMM                | Commercial and Sportfishing  |
| CWA                 | Clean Water Act  |
| EDD                 | Electronic Data Deliverable  |
| EM&TS               | City of San Diego Environmental Monitoring & Technical Services  |
| EPA                 | United States Environmental Protection Agency  |
| EST                 | Estuarine Habitat  |
| FIB                 | fecal indicator bacteria   |
| IHA                 | Incidental Harassment Authorization  |
| IND                 | Industrial Supply  |
| MAR                 | Marine Habitat   |
| MIGR                | Fish Migration   |
| mg/kg               | milligrams per kilogram  |
| mg/L                | milligrams per liter   |
| mL                  | milliliter   |
| MMPA                | Marine Mammal Protection Act   |
| MPN                 | most probable number   |

**ACRONYMS AND ABBREVIATIONS (Cont.)**

|             |   |
|-------------|---|
| NAV         | Navigation  |
| NOAA        | National Oceanic and Atmospheric Administration                   |
| NTU         | nephelometric turbidity unit                                      |
| *.pdf       | Portable Document Format  |
| PSO         | Protected Species Observer  |
| QA          | quality assurance   |
| QAPP        | Quality Assurance Project Plan                                    |
| RARE        | Preservation of Rare and Endangered Species                       |
| REC1        | Water Contact Recreation  |
| REC2        | Non-Contact Water Recreation                                      |
| SbS         | subsurface sand   |
| SCCWRP      | Southern California Coastal Water Research Project                |
| SDRWQCB     | California Regional Water Quality Control Board, San Diego Region |
| SHELL       | Shellfish Harvesting  |
| SM          | Standard Method   |
| SPWN        | Fish Spawning   |
| SS          | surface sand  |
| State Board | State Water Resources Control Board                               |
| TMDL        | Total Maximum Daily Load  |
| WARM        | Warm Water Habitat  |
| WILD        | Wildlife Habitat  |

## **1.0 PROJECT DESCRIPTION**

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### **1.1 Introduction**

The California Coastal Commission issued a Notice of Intent to Issue Permit on November 7, 2014, which granted a revised Coastal Development Permit (CDP) to the City of San Diego (City), subject to certain special conditions, including a feasibility study. One of the required objectives of the feasibility study is to analyze the sand quality and methods for improving sand quality, including dredging, at Children's Pool Beach in La Jolla, California. Children's Pool is currently listed on the Clean Water Act (CWA) Section 303(d) List (303(d) List) as impaired for fecal indicator bacteria (FIB). Additionally, researchers have identified pinniped molting and excrement as a potential source of mercury to the environment (McHuron et al. 2014, Cossaboon et al. 2015). To partially fulfill the requirements of feasibility study, the sand study will analyze the current extent and magnitude of FIB and mercury contamination in the beach sand at Children's Pool.

### **1.2 Purpose**

The purpose of this Monitoring Plan is to outline the program designed to determine sand quality at Children's Pool. The data generated will be used to address the following questions:

- What is the spatial and vertical distribution and magnitude of FIB in beach sand?
- What is the spatial and vertical distribution and magnitude of mercury in beach sand?

### **1.3 Site Background**

Children's Pool Beach was established in 1931 with the construction of a seawall on the western side of the point in La Jolla, which created a protected pool area for swimmers. Over the years, sand has partially filled in Children's Pool Beach. Additionally, Pacific harbor seals have taken up residence on the beach. The harbor seal population has been increasing since 1979. Harbor seals haul out on the sand, rocks, and seawall in and around Children's Pool Beach, in numbers ranging from 0 to 250, depending on time of day, season, and weather conditions. A study conducted by Linder (2011) predicted that it was unlikely that harbor seal numbers would exceed 250 individuals because of limited space behind the seawall. During counts of Pacific harbor seals conducted during monitoring of lifeguard tower construction in the area in 2014-2015, 12 counts totaling more than 200 individuals, with a maximum of 238 individuals, occurred. As stated in the Marine Mammal Protection Act (MMPA) Incidental Harassment Authorization (IHA) application for the ongoing lifeguard tower construction at Children's Pool Beach, "At low tide, additional hauling space is available on the rocky reef areas outside the retaining wall and on beaches immediately southward. Radio tagging and photographic studies have revealed that only a portion of the harbor seals utilizing a hauling site are present at any specific moment or day (Hanan 1996; Hanan 2005; Gilbert et al. 2005; Harvey and Goley 2011; Linder 2011). These studies further indicate that the harbor seals are constantly moving along the coast, including to and from the offshore islands, and that there may be as many as 600 harbor seals using Children's Pool Beach during a year, but certainly not all at one time" (City of San Diego 2015). The harbor seals haul out, birth pups, molt, forage,

and mate in and around Children's Pool Beach. Seal pupping occurs from approximately January through May (Hanan 2004; Hanan & Associates 2011; Hanan and Hanan 2014). Per Dr. Doyle Hanan, Children's Pool Beach is one of three mainland harbor seal hauling sites in San Diego County.

California sea lions (*Z. californianus*) and northern elephant seals (*M. angustirostris*) are observed occasionally on this beach and in nearby areas (Yochem and Stewart 1998; Hanan 2004; Hanan & Associates 2011; Hanan and Hanan 2014) in small numbers (less than five). Additionally, northern (*C. ursinus*) and Guadalupe (*A. townsendi*) fur seals have been observed at nearby beaches and once at Children's Pool Beach this year (personal communication with Dr. Doyle Hanan, December 3, 2015), although sightings of these species are rare.

The City has designated Children's Pool Beach as a shared use beach. Many activities currently take place at Children's Pool Beach and the surrounding shoreline areas, including swimming, surfing, kayaking, diving, tide pooling, and nature watching. The Pacific harbor seal colony that has taken up residence at Children's Pool Beach, in particular, draws many nature watchers. During the Pacific harbor seal pupping season (December 15 through May 15, annually), the beach is closed to the public per the revised City CDP issued by the California Coastal Commission. Outside of the pupping season, beach access and recreational uses are permitted, provided that there is no direct harassment of the harbor seals.

Beneficial uses within the Scripps subwatershed (which includes Children's Pool), as designated by the State Water Resources Control Board (State Board) San Diego Region Basin Plan (Basin Plan) for surface waters, are provided in Table 1-1 (SDRWQCB 2007). Currently, Children's Pool is identified in both the Scripps subwatershed Bacteria Total Maximum Daily Load (TMDL) and the 2010 CWA 303(d) List as impaired for indicator bacteria (SDRWQCB 2010a, SDRWQCB 2010b, USEPA 2011).

**Table 1-1.  
 Beneficial Uses for the 303(d) Listed Waterbody**

| Hydrologic Unit  | Waterbody Type | Beneficial Use |     |      |      |      |      |     |      |      |     |      |      |      |      |
|------------------|----------------|----------------|-----|------|------|------|------|-----|------|------|-----|------|------|------|------|
|                  |                | IND            | NAV | REC1 | REC2 | COMM | BIOL | EST | WILD | RARE | MAR | AQUA | MIGR | SPWN | WARM |
| <b>Shoreline</b> |                |                |     |      |      |      |      |     |      |      |     |      |      |      |      |
| Scripps (906.30) | Pacific Ocean  | •              | •   | •    | •    | •    | •    |     | •    | •    | •   | •    | •    | •    | •    |

Notes:  
 AQUA = Aquaculture, BIOL = Preservation of Biological Habitats of Special Significance, COMM = Commercial and Sportfishing, EST = Estuarine Habitat, IND = Industrial Supply, MAR = Marine Habitat, MIGR = Fish Migration, NAV = Navigation, RARE = Preservation of Rare and Endangered Species, REC1 = Water Contact Recreation, REC2 = Non-Contact Water Recreation, SHELL = Shellfish Harvesting, SPWN = Fish Spawning, WARM = Warm Water Habitat, WILD = Wildlife Habitat  
 • Existing Beneficial Use  
 Source: Water Quality Control Plan for the San Diego Basin (9) (Basin Plan) (California Regional Water Quality Control Board, San Diego Region [SDRWQCB] 2007).



Figure 1-1. Study Site

City of San Diego  
Draft Monitoring Plan for the Children's Pool  
Fecal Indicator Bacteria and Mercury Sand Study  
Amec Foster Wheeler Project No. 502515C027  
February 2016

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## 1.4 Project Organization and Responsibilities

For sampling efforts and reporting, the City, Consultants, and Laboratory staff will have the following roles and responsibilities:

- **Contract Manager:** The Contract Manager contracts with the selected consultants and laboratories to implement the monitoring plan and act as the liaison between the City and Contractors. Andre Sonksen is the Contract Manager.
- **Project Manager:** The Project Manager is responsible for overseeing the day-to-day activities of sample collection and ensuring that samples reach the laboratory within stated holding times. Rolf Schottle is the Project Manager.
- **Project Quality Assurance (QA) Officer:** The Project QA Officer conducts quality assurance oversight for the project independently from project management and from the project's monitoring program. Jay Shrake is the Project QA Officer.
- **Laboratory QA Officer/Project Manager:** Each participating laboratory must identify a QA Officer or Project Manager for this monitoring program. The Laboratory Project Manager is responsible for performing sample analyses and implementing quality control procedures in accordance with this Monitoring Plan. Laila Othman (City Environmental Monitoring and Technical Services [EM&TS] Laboratory) and Carla Hollowell (Eurofins-Calscience) are the Laboratory Project Managers.
- **Lead Protected Species Observer:** The National Oceanic and Atmospheric Administration (NOAA)-Fisheries-approved Lead Protected Species Observer (PSO) is responsible for detecting, documenting, and minimizing the number of marine mammal harassment events in accordance with the IHA Permit. Heather Krish is the Lead PSO.

## 1.5 Sampling Schedule

Tasks and deliverables can be found in Table 1-2. All sampling events will be conducted during daylight hours (7:00 – 19:00); sand sampling activities shall be scheduled during the period of lowest haul-out occurrence (approximately 8:30 – 15:30) to the maximum extent practicable. Up to 16 sampling events, approximately 4 hours in duration, will be conducted. The City closes Children's Pool Beach during harbor seal pupping season (December 15 through May 15). In addition, the anticipated MMPA IHA Permit, which is required to perform the monitoring work for the Children's Pool FIB and Mercury Sand Study, stipulates that monitoring is to be performed between June 1, 2016, and December 14, 2016, as to accommodate late weaning seals. All sampling activities will be performed at 850 Coast Boulevard, La Jolla, California 92037: Children's Pool Beach (32.847557°, -117.278485°). A map showing the study area is presented in Figure 1-1.

**Table 1-2.  
 Project Schedule**

| <b>Children's Pool Fecal Indicator Bacteria and Mercury Sand Study</b> |   |  |
|--|---|--|
| <b>Activity</b>  | <b>Date</b>                                   | <b>Deliverable</b>   |
| Project Management and Meetings  | 10 business days after meeting                | Meeting Notes  |
| Incidental Harassment Authorization (IHA) Permit Procurement           | Submitted December 2015                       | Draft Permit Application to City for Review                      |
|  | Submitted December 2015                       | Permit Application to NOAA                                       |
| Monitoring Plan and Quality Assurance Project Plan (QAPP) Development  | January 29, 2016                              | Draft Monitoring Plan and QAPP (to City)                         |
|  | March 18, 2016                                | Final Monitoring Plan and QAPP (to City)                         |
|  | February 2016                                 | Draft Monitoring Plan and QAPP (to NMSF)                         |
| Field Monitoring   | June 1, 2016 through December 14, 2016        | Laboratory Electronic Data Deliverable (EDD) (FY2017)            |
| Reporting  | TBD   | Draft Technical Memorandum (FY2017)                              |
|  | Before March 15, 2017, ≤90 days post sampling | Draft Monitoring Report (to Office of Protected Resources, NMFS) |
|  | TBD, 30 days after comments from NMFS         | Final Monitoring Report (to Office of Protected Resources, NMFS) |

## **2.0 MONITORING APPROACH**

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This section describes the purpose, scope, and type of sampling to be conducted. Additional details of the sampling and analytical methodology and data quality objectives are described in the Quality Assurance Project Plan (QAPP), provided as Appendix A.

### **2.1 Incidental Harassment Authority Permit**

Before sampling of beach sand can take place, the City must obtain an IHA permit that allows for Level B harassment of marine mammals that use the area. An application for an IHA pursuant to the MMPA was submitted to the NOAA Fisheries Office of Protected Resources for review in December 2015.

Based on preliminary investigation, it was determined that an IHA permit under the Marine Mammal Protection Act is necessary to perform this study, due to the likelihood for IHA Level B harassment of harbor seals during sample collection. Level B harassment has the potential to disturb a marine mammal by causing disruption of behavioral patterns such as nursing, breeding, feeding, or sheltering, but does not have the potential to cause injury or direct contact, considered as Level A harassment. The IHA permit is effective for up to one year: it is assumed that the monitoring portion of this study will be completed within this timeframe, and an IHA permit renewal is required for additional work outside of this time frame. The sand study will have the potential to alert and flush harbor seals into the water during sampling events. Assuming that all harbor seals potentially hauled out at Children's Pool Beach would be exposed to Level B harassment during sampling events, there could be a maximum of 3,040 incidental harbor seal takes. The City requested the Incidental Harassment Authority for 3,040 Pacific harbor seals, 100 California sea lion and 10 northern elephant seal take authorizations for June 2016 through December 2016 during the non-pupping season.

Once the IHA permit is approved, it is valid for up to one year. The permit, once issued, may have special provisions that will require the amendment of the current monitoring plan and QAPP for the sand study sampling events.

#### **2.1.1 Sampling Schedule and Procedures**

Up to 16 sampling events may take place under this Monitoring Plan, with 6 primary events currently planned. The first monitoring event will be conducted following the formal end of harbor seal pupping season beach access restriction, inclusive of a two week extension to accommodate late weaning harbor seals beginning on June 1, 2016 and completed prior to December 15, 2016.

Per anticipated requirements of the IHA Permit, sand sampling activities will not be conducted if Guadalupe fur or Northern fur seals are present on the beach. Sighting of these species are rare and may be associated with well documented pinniped malnutrition and die-off observed during the current El Nino conditions. If either of these two species is observed, it will be presumed that these seal(s) are stranded and the Sea World stranded animal hotline (1-800-541-7235) as well as the NOAA regional marine stranded mammal coordinator will be

immediately notified (<http://www.nmfs.noaa.gov/pr/health/report.htm>). Sampling will be rescheduled to a time after either of these depleted species have been removed by rescuers or return to the offshore. Scheduling sand sampling activities, to the maximum extent practicable, will be performed during the daily period of lowest haul-out occurrence (08:30-15:30), and sampling locations will be offset to accommodate hauled out pinnipeds during each monitoring event. However, sand sampling activities may be extended from 7:00 to 19:00. (*i.e.*, daylight hours) to help assure that the project is completed during the 2016 sand sampling window and to assure that activities are conducted during lowest numbers of hauled out pinnipeds. During sand sampling, field teams will maintain a distance of at least 3 meters from any hauled-out pinniped. A PSO will conduct monitoring concurrent to all sampling activities to document pinniped behaviors and responses as required by the IHA Permit. PSO observations will be recorded using a customized log sheet in accordance to the IHA and corresponding amendment. A draft field monitoring form is provided in Appendix B.

### **2.1.2 Field Teams – Composition and Training**

A NMFS-qualified, trained Protected Species Observer (PSO) shall be used to detect, document, and minimize potential impacts from sand sampling activities. The PSO shall attend the project site 30 minutes prior until 30 minutes after sand sampling activities cease each day throughout the sand quality study window. The PSO shall be approved by NMFS prior to commencement of activities.

The PSO will be a trained biologist with the following minimum requirements:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of target species with ability to estimate required reporting parameters (*i.e.*, species; size; life stage; sex; etc.); use of binoculars may be necessary to correctly identify the target;
- Advanced education in biological science or related field (undergraduate degree or higher required);
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the study activities and area to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when study activities were conducted; all relevant information regarding disturbance of marine mammals due to study activities; and marine mammal behavior in relation to study activities; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

- Advanced education may not be necessary in this case. The point is to have some assurance that at minimum the head observer has demonstrated competency. Training should include:
  - The MMPA and conditions of the IHA
  - Required monitoring protocols
  - Relevant species identification
  - Age class identification
  - Recording of count and disturbance observations (including completion of data sheets)
  - Use of equipment

Prior to sampling events, all field staff will take part in marine mammal training conducted by a qualified biologist. It is assumed that two or three City staff will participate in each monitoring event, in both field sampling (one or two staff members) and PSO (one staff member) roles. It is assumed that up to two Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) staff members will participate in each monitoring event, in both field support and technical lead roles, subject to any restrictions in the approved IHA.

The PSO shall search for marine mammals using binoculars and/or the naked eye within the study area. The PSO will observe (weather permitting) from the base of the cliff, on the sidewalk above the site, the staircase platform just above the beach, or the seawall catwalk, depending on where the best vantage is to observe where pinnipeds are present. The Project Manager will be available to assist on the beach as needed, but the Project Manager's primary role is to interact with and inform the public and any special interest groups on the sidewalk, oversee the sample collections, and function as a secondary PSO to confirm observations. Both the PSO and Project Manager will be in direct contact with the field team members on the beach via walkie-talkie or cell phone.

## **2.2 Beach Sand Sampling**

### **2.2.1 Fecal Indicator Bacteria**

The first three sampling events (herein referred to as Phase 1a) are designed to maximize sampling area and to capture critical conditions when FIB may be at their highest concentrations. During each Phase 1a event, three transects parallel to the shoreline at the swash zone, the high-tide line, and the supralittoral zone will be established relative to the seawall railing and three surface sand (SS) FIB samples (top 2 centimeters) will be collected across each of the transects at approximately left, middle, and right beach (Figure 2-1). GPS coordinates for each sample will be recorded along each transect. In addition, subsurface sand (SbS) FIB samples will also be collected at three of the nine SS sampling location during each event at approximately 25–50 centimeters below the surface. Additional adaptive FIB samples may be collected to document event-specific conditions, such as areas recently occupied by pinnipeds, areas of wrack deposits, or additional depths at existing sampling locations. A

maximum of 21 FIB samples, including field replicates, will be collected for each Phase 1a monitoring event, for an approximate maximum Phase 1a total of 63 FIB samples. The remaining three sampling events (herein referred to as Phase 1b) will consist of biased sampling based on Phase 1a preliminary findings. The study design for Phase 1b will be finalized in consultation with the City. A maximum of 21 FIB samples, including field replicates, will be collected for each Phase 1b monitoring event, for an approximate maximum Phase 1b total of 63 FIB samples.

Because of the known heterogeneity of sediment bacteria populations, field replicates will be collected at a rate of approximately 10 percent (%) of the total sample count. All sand samples will be collected in sterile containers and transported on ice to the laboratory within six hours of collection. The City of San Diego EM&TS laboratory will perform analysis of sand samples.

### **2.2.2 Total Mercury**

Additionally, because of the potential for mercury deposition to the beach through pinniped molt and feces, total mercury may be added as an analytical constituent for up to 5 SS samples per event. A maximum of 32 mercury samples, including field replicates, may be collected during Phase 1a and 1b monitoring. The study design will be finalized in consultation with the City. Eurofins-Calscience Laboratories will perform analysis of mercury samples.



Figure 2-1. Map of Beach Sampling Locations

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### 2.2.3 Constituents

FIB and total mercury are the target constituents for the sand study. Grab samples will be collected aseptically and analyzed for target FIB in accordance with the Southern California Coastal Water Research Project (SCCWRP) sand protocol (SCCWRP, 2009). Because bacteria levels are being measured from sand samples, the values reported are not directly comparable with existing water quality reporting limits or water quality objectives. The results will provide a relative magnitude of FIB concentrations in beach sand from which appropriate recommendations may be made. Table 2-1 presents the constituents, reporting limits, and analytical methods.

**Table 2-1.  
 Analyses for FIB and Mercury Sand Study**

| Parameter           | Analytical Methods |
|---------------------|--------------------|
| <i>Enterococcus</i> | EPA 1600           |
| Fecal Coliform      | SM 9222D           |
| Total Coliform      | SM 9222B           |
| Total Mercury       | EPA 7471A          |

### 2.3 Optional Reference Beach Monitoring

Marine mammal molting and excrement on the sand have been linked to elevated mercury concentrations in beach sand (McHuron et al. 2014, Cossaboon et al. 2015). Therefore, a beach in close proximity to Children's Pool, where marine mammals are not typically observed, may be sampled as a reference site to assess pinniped-associated mercury deposition. South Boomers Beach is located directly north of Children's Pool and is easily accessible via the stepped rocky bluff south of Point La Jolla Beach sand samples may be collected at this site when sand samples at Children's Pool are designated for total mercury analysis. Reference samples may also be collected for FIB testing dependent on results from Phase 1 testing. Samples will be collected at the same depth from surface and tidal interface and paired to Children's Pool samples during the same event (e.g., same swash zone, or supralittoral zone). It is anticipated that no more than 3 reference samples will be collected per event.

### 2.4 Non-Direct Measurements (Bacteria TMDL Water Quality Data)

The City conducts water quality monitoring at Children's Pool as part of the Scripps HA Bacteria TMDL compliance monitoring program. From April through October, the City measures field parameters (see Table 2-2) as well as FIB during dry weather approximately weekly (minimum of five events per month). For November through March, the City samples during dry weather once per month in addition to sampling within 24 hours of the end of precipitation for three qualifying storm events. Sand quality sampling events will be coordinated with water quality monitoring events to the maximum extent practicable to improve assessment of sand quality.

**Table 2-2.  
 Optional Field Parameters**

| <b>Field Parameter</b> | <b>Method</b>                     | <b>Unit</b> |
|------------------------|-----------------------------------|-------------|
| Dissolved Oxygen       | YSI Pro ODO Field Meter           | mg/L        |
| pH                     | YSI Professional Plus Field Meter | -           |
| Specific Conductivity  | YSI Professional Plus Field Meter | µS/cm       |
| Temperature            | YSI Professional Plus Field Meter | °C          |
| Turbidity              | YSI Professional Plus Field Meter | NTU         |

Notes:

°C = degrees Celsius; µS/cm = microsiemens per centimeter, mg/L = milligrams per liter, NTU= nephelometric turbidity unit

### **3.0 DATA MANAGEMENT AND REPORTING PROCEDURES**

---

This section describes the management of field and analytical data and reporting procedures for the Children's Pool Fecal Indicator Bacteria and Mercury Sand Study.

#### **3.1 Data Management**

Field Data Records and Analytical Data Reports will be sent to and kept by the designated City of San Diego Project Manager:

Amec Foster Wheeler will review all Field Data Log Sheets for completeness, maintain the original hardcopies, and scan electronic copies (\*.pdf) for storage in the project file. Copies of Field Data Log Sheets and photographs for each event will be submitted to the City of San Diego with each EDD submittal. The field team will retain the original Field Data Log Sheets.

The laboratories will provide data in electronic format: both \*.pdf copies of lab reports and an EDD. Analytical results will be submitted to the Sampling Agency in \*.pdf format and as an EDD within three weeks of submittal of samples. The Sampling Agency will review all lab reports and EDDs for accuracy and completeness. The contract laboratory will retain original chain of custody (COC) forms. The contract laboratory will retain copies of the preliminary and final data reports.

#### **3.2 Reporting Procedures**

Amec Foster Wheeler will provide a laboratory EDD, data analysis and a draft technical memorandum, all tentatively planned for fiscal year 2017. The technical memorandum will describe the methods of sample collection, present results, and address the study questions.

City of San Diego  
Draft Monitoring Plan for the Children's Pool  
Fecal Indicator Bacteria and Mercury Sand Study  
Amec Foster Wheeler Project No. 502515C027  
February 2016

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February 2016

## **APPENDIX A**

### **CHILDREN'S POOL FECAL INDICATOR BACTERIA AND MERCURY SAND STUDY DRAFT QUALITY ASSURANCE PROJECT PLAN**

City of San Diego  
Draft Monitoring Plan for the Children's Pool  
Fecal Indicator Bacteria and Mercury Sand Study  
Amec Foster Wheeler Project No. 502515C027  
February 2016

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**DRAFT**  
**QUALITY ASSURANCE PROJECT PLAN FOR THE CHILDREN'S POOL**  
**FECAL INDICATOR BACTERIA AND MERCURY SAND STUDY**

**Submitted to:**  
**City of San Diego**  
**Transportation & Storm Water Department**  
**9370 Chesapeake Drive, Suite 100**  
**San Diego, California 92123**



**Submitted by:**  
**Amec Foster Wheeler Environment & Infrastructure, Inc.**  
**San Diego, California**

**February 2016**

**Amec Foster Wheeler Project No. 502515C027**  
**QAPP Revision No. 01**



**GROUP A ELEMENTS: PROJECT MANAGEMENT**

**1.0 TITLE AND APPROVAL SHEETS**

---

DRAFT  
QUALITY ASSURANCE PROJECT PLAN FOR THE CHILDREN'S POOL  
FECAL INDICATOR BACTERIA AND MERCURY SAND STUDY

February 2016

**Submitted to:**  
City of San Diego  
Transportation & Storm Water Department  
9370 Chesapeake Drive, Suite 100  
San Diego, California 92123

**Submitted by:**  
Amec Foster Wheeler Environment & Infrastructure, Inc.  
San Diego, California

**Amec Foster Wheeler Project No. 502515C027**  
**QAPP Revision No. 01**

Approval Signatures:

| <b>Title:</b>                                  | <b>Name:</b>    | <b>Signature:</b> | <b>Date*:</b> |
|--|-----------------|-------------------|---------------|
| City of San Diego Contract<br>Manager          | Andre Sonksen   | _____             | _____         |
| Amec Foster Wheeler<br>Project QA Officer      | Jay Shrake      | _____             | _____         |
| Amec Foster Wheeler<br>Project Manager         | Rolf Schottle   | _____             | _____         |
| City of San Diego EM&TS<br>Lab Project Manager | Laila Othman    | _____             | _____         |
| Eurofins-Calscience Project<br>Manager         | Carla Hollowell | _____             | _____         |
| Protected Species Observer<br>(PSO) Lead       | Heather Krish   | _____             | _____         |

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## ACRONYMS AND ABBREVIATIONS

|                     |  |
|---------------------|--|
| °C                  | degrees Celsius  |
| µS/cm               | microsiemens per centimeter  |
| %                   | percent  |
| 303(d) List         | Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments  |
| AB                  | Assembly Bill  |
| Amec Foster Wheeler | Amec Foster Wheeler Environment & Infrastructure, Inc.   |
| AQUA                | Aquaculture  |
| Bacteria TMDL       | <i>A Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria Project I-Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)</i> |
| Basin Plan          | San Diego Region Basin Plan  |
| BIOL                | Preservation of Biological Habitats of Special Significance  |
| CDP                 | Coastal Development Permit   |
| City                | City of San Diego  |
| CLRP                | Comprehensive Load Reduction Program   |
| COC                 | chain of custody   |
| COMM                | Commercial and Sportfishing  |
| CWA                 | Clean Water Act  |
| DHS                 | California Department of Health Services   |
| DQO                 | data quality objective   |
| EDD                 | Electronic Data Deliverable  |
| ELAP                | Environmental Laboratory Accreditation Program   |
| EM&TS               | City of San Diego Environmental Monitoring & Technical Services  |
| EPA                 | United States Environmental Protection Agency  |
| EST                 | Estuarine Habitat  |
| FIB                 | fecal indicator bacteria   |
| ID                  | identification   |
| IHA                 | Incidental Harassment Authorization  |
| IND                 | Industrial Supply  |
| JPEG                | Joint Photographic Experts Group   |
| MAR                 | Marine Habitat   |
| MIGR                | Fish Migration   |
| mg/kg               | milligrams per kilogram  |

**ACRONYMS AND ABBREVIATIONS (Cont.)**

|             |   |
|-------------|---|
| mg/L        | milligrams per liter  |
| mL          | milliliter  |
| MPN         | most probable number  |
| NA          | not applicable  |
| NAV         | Navigation  |
| NOAA        | National Oceanic and Atmospheric Administration                   |
| NTU         | nephelometric turbidity unit                                      |
| *.pdf       | Portable Document Format  |
| PSO         | Protected Species Observer  |
| QA          | quality assurance   |
| QAPP        | Quality Assurance Project Plan                                    |
| QC          | quality control   |
| RARE        | Preservation of Rare and Endangered Species                       |
| REC1        | Water Contact Recreation  |
| REC2        | Non-Contact Water Recreation                                      |
| RL          | reporting limit   |
| RPD         | relative percent difference                                       |
| SbS         | subsurface sand   |
| SDRWQCB     | California Regional Water Quality Control Board, San Diego Region |
| SHELL       | Shellfish Harvesting  |
| SM          | Standard Method   |
| SOP         | standard operating procedure                                      |
| SPWN        | Fish Spawning   |
| SS          | surface sand  |
| State Board | State Water Resources Control Board                               |
| SWAMP       | Surface Water Ambient Monitoring Program                          |
| TBD         | to be determined  |
| TMDL        | Total Maximum Daily Load  |
| WARM        | Warm Water Habitat  |
| WILD        | Wildlife Habitat  |

## 2.0 DISTRIBUTION LIST

| <b>Title:</b>   | <b>Name (Affiliation):</b>                        | <b>Tel. No.:</b> | <b>QAPP No.:</b> |
|---|---|------------------|------------------|
| Contract Manager  | Andre Sonksen (City of San Diego)                 | 858-541-4317     | 1.0              |
| Project Quality Assurance (QA) Officer  | Jay Shrake (Amec Foster Wheeler)                  | 858-514-6459     | 1.0              |
| Project Manager   | Rolf Schottle (Amec Foster Wheeler)               | 858-300-4323     | 1.0              |
| City of San Diego Environmental Monitoring & Technical Services (EM&TS) Lab Project Manager | Laila Othman (City of San Diego EM&TS Laboratory) | 619-758-2312     | 1.0              |
| Eurofins-Calscience Project Manager   | Carla Hollowell (Eurofins-Calscience)             | 515-280-8378     | 1.0              |
| Protected Species Observer (PSO) Lead   | Heather Krish (City of San Diego)                 | 858-541-4319     | 1.0              |

Laboratory Managers will receive an electronic copy of the QAPP.

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Draft Quality Assurance Plan for the Children's Pool  
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Amec Foster Wheeler Project No. 502515C027  
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February 2016

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### 3.0 PROJECT/TASK ORGANIZATION

#### 3.1 Involved Parties and Roles

The City of San Diego, consultants, and laboratory staff will have the following roles and responsibilities (Table 3-1):

- **Contract Manager:** Andre Sonksen is the Contract Manager for the City of San Diego (City). The Contract Manager will be responsible for establishing contracts with the selected consultants and/or laboratories to implement the Children's Pool Fecal Indicator Bacteria and Mercury Sand Study (sand study) and act as the liaison between the Responsible Party (City) and consultants.
- **Project Manager:** Rolf Schottle is the Project Manager. The Project Manager will be responsible for overseeing the day-to-day activities of implementing the sand study.
- **Project Quality Assurance (QA) Officer:** Jay Shrake is the Project QA Officer. The Project QA Officer will be responsible for overseeing the project QA activities independently from the Project Manager to ensure that project implementation is being conducted in accordance with this Quality Assurance Project Plan (QAPP).
- **Laboratory QA Officer/Project Manager:** Laila Othman is the Laboratory Project Manager with the City of San Diego EM&TS Lab. Carla Hollowell is the Laboratory Project Manager with Eurofins-Calscience.
- **Protected Species Observer Lead:** Heather Krish is the PSO lead. The National Oceanic and Atmospheric Administration (NOAA)-Fisheries-approved PSO is responsible for detecting, documenting, and minimizing the number of marine mammal harassment events in accordance with the IHA Permit.

**Table 3-1.  
 Personnel Responsibilities**

| Name            | Organizational Affiliation  | Role/Responsibility   | Contact Information                           |
|-----------------|-----------------------------|-----------------------|---|
| Andre Sonksen   | City of San Diego           | Contract Manager      | 858-541-4317<br>asonksen@sandiego.gov         |
| Rolf Schottle   | Amec Foster Wheeler         | Project Manager       | 858-514-6459<br>rolf.schottle@amecfw.com      |
| Jay Shrake      | Amec Foster Wheeler         | Project QA Officer    | 858-300-4323<br>jay.shrake@amecfw.com         |
| Laila Othman    | City of San Diego EM&TS Lab | Laboratory QA Officer | 619-758-2312<br>lothman@sandiego.gov          |
| Carla Hollowell | Eurofins-Calscience         | Laboratory QA Officer | 515-280-8378<br>carlahollowell@eurofinsus.com |
| Heather Krish   | City of San Diego           | PSO Lead              | 858-541-4319<br>hkrish@sandiego.gov           |

### **3.2 Quality Assurance Officer Role**

The Project QA Officer position is independent of data generation. The Project QA Officer will ensure that the QA and quality control (QC) procedures set in place in this document will be properly applied throughout the sampling activities and analysis. The Project QA Officer will coordinate with the Project Managers and QA Officers of participating laboratories to ensure that all QA and QC procedures within this QAPP are understood and followed by participating labs.

### **3.3 Persons Responsible for QAPP Update and Maintenance**

The Project Manager and Project QA Officer are responsible for maintaining this QAPP. Changes and updates to this QAPP may be made by the Project Manager or Project QA Officer. The Project Manager will be responsible for making the changes and ensuring that these updates are provided to each of the participating agencies as listed in Table 3-1. Previous versions of the QAPP should be removed to avoid any confusion regarding the most current version of the QAPP.

## **4.0 PROBLEM DEFINITION/BACKGROUND**

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### **4.1 Problem Statement**

Children's Pool Beach was established in 1931 with the construction of a seawall on the western side of the point in La Jolla, California, which created a protected pool area for swimmers. Over the years, sand has partially filled in Children's Pool Beach. Additionally, Pacific harbor seals have taken up residence on the beach. The harbor seal population has been increasing since 1979. The harbor seals haul out, birth pups, molt, forage, and mate in and around Children's Pool Beach. Seal pupping occurs from approximately January through May (Hanan 2004; Hanan & Associates 2011; Hanan and Hanan 2014). Several studies have identified harbor seal behavior and estimated harbor seal numbers, including patterns of daily and seasonal area use (Yochem and Stewart 1998; Hanan 2004; Hanan & Associates 2011; Linder 2011; Hanan and Hanan 2014). Per Dr. Doyle Hanan, Children's Pool Beach is one of three mainland harbor seal hauling sites in San Diego County.

Children's Pool is currently listed on the Clean Water Act (CWA) Section 303(d) List (303(d) List) as impaired for fecal indicator bacteria (FIB). Additionally, researchers have identified pinniped molting and excrement as a potential source of mercury to the environment (McHuron et al. 2014, Cossaboon et al. 2015).

The California Coastal Commission issued a Notice of Intent to Issue Permit on November 7, 2014, which granted a revised Coastal Development Permit (CDP) to the City, subject to certain special conditions, including a feasibility study. One of the required objectives of the feasibility study is to analyze the sand quality and methods for improving sand quality, including dredging, at Children's Pool Beach.

This sand study will analyze the current extent and magnitude of FIB and mercury contamination in the beach sand at Children's Pool Beach. The purpose of this QAPP is to outline the methodology and data quality requirements to meet the goals of the feasibility study.

### **4.2 Decisions or Outcomes**

The data generated by this project will be used to determine the quality of beach sand at Children's Pool using bacteria counts and mercury concentrations as indicators.

The general approach and specific design elements of the project are driven by the following monitoring questions:

- What is the spatial and vertical distribution and magnitude of FIB in beach sand?
- What is the spatial and vertical distribution and magnitude of mercury in beach sand?

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## **5.0 PROJECT/TASK DESCRIPTION**

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This QAPP reflects the beach sand sampling and reporting components of the Children's Pool Sand Fecal Indicator Bacteria and Mercury Sand Study.

### **5.1 Field Teams, Procedures and Sampling Schedule**

Up to 16 sampling events may take place under this Monitoring Plan, with 6 primary events currently planned. The first monitoring event will be conducted two weeks following the end of the formal harbor seal pupping season (June 1, 2016) and completed prior to December 15, 2016. Although May 15 is the end of pupping season according to the City CDP, the National Oceanic and Atmospheric Administration (NOAA) is requesting a start date of June 1 as a provision of the IHA permit to accommodate late weaning pups that may still be present on the beach. Reporting will continue through the City of San Diego 2016-2017 fiscal year (before June 1, 2017).

Sand sampling activities will not be conducted if Guadalupe or Northern fur seals are present on the beach. Scheduling sand sampling activities will be performed during daylight hours (07:00-19:00) and, to the maximum extent practicable, will be performed during the daily period of lowest haul-out occurrence (08:00-15:30). Sampling locations will be offset to accommodate hauled out pinnipeds during each monitoring event. During sand sampling, field teams will maintain a distance of at least 3 meters from any hauled-out pinniped. A PSO will conduct monitoring concurrent to all sampling activities to document pinniped behaviors and responses as required by the IHA Permit.

#### **5.1.1 Field Teams – Composition and Training**

A NMFS-qualified, trained Protected Species Observer (PSO) shall be used to detect, document, and minimize potential impacts from sand sampling activities. The PSO shall attend the project site 30 minutes prior until 30 minutes after sand sampling activities cease each day throughout the sand quality study window. The PSO shall be approved by NMFS prior to commencement of activities.

The PSO will be a trained biologist with the following minimum requirements:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of target species with ability to estimate required reporting parameters (i.e., species; size; life stage; sex; etc.); use of binoculars may be necessary to correctly identify the target;
- Advanced education in biological science or related field (undergraduate degree or higher required);
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);
- Experience or training in the field identification of marine mammals, including the identification of behaviors;

- Sufficient training, orientation, or experience with the study activities and area to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when study activities were conducted; all relevant information regarding disturbance of marine mammals due to study activities; and marine mammal behavior in relation to study activities; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.
- Advanced education may not be necessary in this case. The point is to have some assurance that at minimum the head observer has demonstrated competency. Training should include:
  - The MMPA and conditions of the IHA
  - Required monitoring protocols
  - Relevant species identification
  - Age class identification
  - Recording of count and disturbance observations (including completion of data sheets)
  - Use of equipment

Prior to sampling events, all field staff will take part in marine mammal training conducted by a qualified biologist. It is assumed that two or three City staff will participate in each monitoring event, in both field support (one or two staff members) and PSO (one staff member) roles. It is assumed that up to two Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) staff members will participate in each monitoring event, in both field support and technical lead roles, subject to any restrictions in the approved Incidental Harassment Authorization (IHA).

The PSO shall search for marine mammals using binoculars and/or the naked eye within the study area. The PSO will observe (weather permitting) from the base of the cliff, on the sidewalk above the site, the staircase platform just above the beach, or the seawall catwalk, depending on where the best vantage is to observe where pinnipeds are present. The Project Manager will be available to assist on the beach as needed, but the Project Manager's primary role is to interact with and inform the public and any special interest groups on the sidewalk, oversee the sample collections, and function as a secondary PSO to confirm observations. Both the PSO and Project Manager will be in direct contact with the field team members on the beach via walkie-talkie or cell phone.

### **5.1.2 Fecal Indicator Bacteria Sampling**

The first three sampling events (herein referred to as Phase 1a) are designed to maximize sampling area and to capture critical conditions when FIB may be at their highest concentrations. During each Phase 1a event, three transects parallel to the shoreline at the swash zone, the high-tide line, and the supralittoral zone will be established relative to the seawall railing and three surface sand (SS) FIB samples (top 2 centimeters) will be collected across each of the transects at approximately left, middle, and right beach. GPS coordinates for each sample collected along the transects will be recorded. In addition, subsurface sand (SbS) FIB samples will also be collected at three of the nine SS sampling locations during each event at approximately 25–50 centimeters below the surface. Additional adaptive FIB samples will be collected to document event-specific conditions, such as areas recently occupied by pinnipeds, areas of wrack deposits, or additional depths at existing sampling locations. A maximum of 21 FIB samples, including field replicates, will be collected for each Phase 1a monitoring event, for an approximate maximum Phase 1a total of 63 FIB samples. The remaining three sampling events (herein referred to as Phase 1b) will consist of biased sampling based on Phase 1a preliminary findings. The study design for Phase 1b will be finalized in consultation with the City. A maximum of 21 FIB samples, including field replicates, will be collected for each Phase 1b monitoring event, for an approximate maximum Phase 1b total of 63 FIB samples. Based on the combined Phase 1a and Phase 1b results up to an additional 10 sample collection events will be performed.

Because of the known heterogeneity of sediment bacteria populations, field replicates will be collected at a rate of approximately 10 percent (%) of the total sample count. All sand samples will be collected in sterile containers and transported on ice to the laboratory within six hours of collection. The City of San Diego Environmental Monitoring & Technical Services (EM&TS) laboratory will perform analysis of sand samples.

### **5.1.3 Total Mercury Sampling**

Additionally, because of the potential for mercury deposition to the beach through pinniped feces, total mercury may be added as an analytical constituent for up to 5 SS samples per event. A maximum of 32 mercury samples, including field replicates, may be collected during Phase 1a and 1b monitoring. The study design will be finalized in consultation with the City. Eurofins-Calscience Laboratories will perform analysis of mercury samples.

### **5.1.4 Optional/Non-Direct Monitoring**

#### **5.1.4.1 Reference Beach Monitoring**

Marine mammal molting and excrement on the sand have been linked to elevated mercury concentrations in beach sand (McHuron et al. 2014, Cossaboon et al. 2015). Therefore, a beach in close proximity to Children's Pool, where marine mammals are not typically observed, may be sampled as a reference site to assess pinniped-associated mercury deposition. South Boomers Beach is located directly north of Children's Pool and is easily accessible via the stepped rocky bluff south of Point La Jolla. Beach sand samples may be collected at this site

when sand samples at Children's Pool are designated for total mercury analysis. Reference samples may also be collected for FIB testing dependent on results from Phase 1 testing, although this beach is known to harbor significant numbers of seagulls (known sources of FIB) which may complicate reference comparisons for FIB. Samples will be collected at the same depth from surface and tidal interface and paired to Children's Pool samples during the same event (e.g., same swash zone, or supralittoral zone). It is anticipated that no more than 3 reference samples will be collected per event.

#### 5.1.4.2 Bacteria TMDL Monitoring

The City conducts water quality monitoring at Children's Pool as part of the Scripps HA Bacteria TMDL compliance monitoring program. From April through October, the City measures field parameters (see Table 5-1) as well as FIB during dry weather approximately weekly (minimum of five events per month). For November through March, the City samples during dry weather once per month in addition to sampling within 24 hours of the end of precipitation for three qualifying storm events. Sand sampling events will be coordinated with water quality monitoring events to the maximum extent practicable to improve assessment of sand quality.

**Table 5-1.  
 Optional Field Parameters**

| Field Parameter       | Method                            | Unit  |
|-----------------------|-----------------------------------|-------|
| Dissolved Oxygen      | YSI Pro ODO Field Meter           | mg/L  |
| pH                    | YSI Professional Plus Field Meter | -     |
| Specific Conductivity | YSI Professional Plus Field Meter | µS/cm |
| Temperature           | YSI Professional Plus Field Meter | °C    |
| Turbidity             | YSI Professional Plus Field Meter | NTU   |

Notes:  
 °C = degrees Celsius; µS/cm = microsiemens per centimeter, mg/L = milligrams per liter, NTU= nephelometric turbidity unit

#### 5.1.5 Reporting

Amec Foster Wheeler will provide a laboratory EDD, data analysis and a draft technical memorandum, all tentatively planned for fiscal year 2017. The technical memorandum will describe the methods of sample collection, present results, and address the study questions.

### 5.2 Monitored Constituents and Measurement Techniques

Samples will be analyzed for FIB and total mercury. Table 5-2 provides a master list of analytical constituents as well as applicable Surface Water Ambient Monitoring Program (SWAMP) requirements.

**Table 5-2.  
 Master List of Analytical Constituents**

| Constituents        | Method    | Target Reporting Limit | Analytical Laboratory |
|---------------------|-----------|------------------------|-----------------------|
| <i>Enterococcus</i> | EPA 1600  | NA                     | City EM&TS            |
| Fecal coliform      | SM 9222D  | NA                     |                       |
| Total coliform      | SM 9222B  | NA                     |                       |
| Total Mercury       | EPA 7471A | 0.00587 mg/kg          | Eurofins-Calscience   |

Notes:

EPA = United States Environmental Protection Agency; mg/kg = milligrams per kilogram; mL = milliliters; MPN = most probable number; NA = not applicable; SM = Standard Method

### 5.3 Project Schedule and Sample Timing

Tasks and deliverables are presented in Table 5-3. All sampling events will be conducted during daylight hours; each event will be approximately 4 hours in duration. To the maximum extent practicable, sand sampling activities shall be conducted from approximately 8:30 to 15:30., during the daily period of lowest haul-out occurrence; however, sand sampling activities may be extended from 7:00 to 19:00 (*i.e.*, daylight hours) to help assure that the project is completed during the 2016 sand sampling window and to assure that activities are conducted during lowest numbers of hauled out pinnipeds. The PSO shall attend the project site 30 minutes prior until 30 minutes after sand sampling activities cease each day throughout the sand quality study window. Up to 16 sampling events will be conducted, with Phase 1 consisting of the first 6 events. Pending the results of the Phase 1 study, up to 10 subsequent sampling events will be conducted. The City closes Children's Pool Beach during harbor seal pupping season (December 15 through May 15). In addition, the IHA Permit, which is required to perform the monitoring work for the Children's Pool FIB and Mercury Sand Study, stipulates that monitoring is to be performed between June 1, 2016, as to accommodate late weaning seals, and December 14, 2016. All permitted sampling activities will be performed at 850 Coast Boulevard, La Jolla, California 92037: Children's Pool Beach (32.847557°, -117.278485°). Optional monitoring for mercury testing only may be conducted as described in Section 5.1.4.1. A map showing the study area is presented in Figure 5-1.

**Table 5-3.  
 Project Schedule**

| Children's Pool Fecal Indicator Bacteria and Mercury Sand Study |   |  |
|---|---|--|
| Activity  | Date  | Deliverable  |
| Project Management and Meetings                                 | 10 business days after meeting                | Meeting Notes  |
| IHA Permit Procurement  | Submitted December 2015                       | Draft Permit Application to City for Review                      |
|   | Submitted December 2015                       | Permit Application to NOAA                                       |
| Monitoring Plan and QAPP Development                            | January 29, 2016                              | Draft Monitoring Plan and QAPP (to City)                         |
|   | March 18, 2016                                | Final Monitoring Plan and QAPP (to City)                         |
|   | February 2016                                 | Draft Monitoring Plan and QAPP (to NMSF)                         |
| Field Monitoring  | June 1, 2016 through December 14, 2016        | Laboratory Electronic Data Deliverable (EDD) (FY 2017)           |
| Reporting   | TBD (FY2017)                                  | Draft Technical Memorandum (to City)                             |
|   | Before March 15, 2017, ≤90 days post sampling | Draft Monitoring Report (to Office of Protected Resources, NMFS) |
|   | TBD, 30 days after comments from NMFS         | Final Monitoring Report (to Office of Protected Resources, NMFS) |

#### 5.4 Geographical Setting

The City has designated Children's Pool Beach as a shared use beach. Many activities currently take place at Children's Pool Beach and the surrounding shoreline areas, including swimming, surfing, kayaking, diving, tide pooling, and nature watching. The Pacific harbor seal colony that has taken up residence at Children's Pool Beach, in particular, draws many nature watchers. During the Pacific harbor seal pupping season (December 15 through May 15, annually), the beach is closed to the public per the revised City CDP issued by the California Coastal Commission. Outside of the pupping season, beach access and recreational uses are permitted, provided that there is no direct harassment of the harbor seals.

Beneficial uses within the Scripps subwatershed (which includes Children's Pool), as designated by the State Water Resources Control Board (State Board) San Diego Region Basin Plan (Basin Plan ) for surface waters, are provided in Table 5-4 (SDRWQCB 2007). Currently, Children's Pool is identified in both the Scripps subwatershed Bacteria Total Maximum Daily Load (TMDL) and the 2010 CWA 303(d) List as impaired for indicator bacteria (SDRWQCB 2010a, SDRWQCB 2010b, USEPA 2011).

**Table 5-4.  
 Beneficial Uses for the 303(d) Listed Waterbody**

| Hydrologic Unit  | Waterbody Type | Beneficial Use |     |      |      |      |      |     |      |      |     |      |      |      |      |
|------------------|----------------|----------------|-----|------|------|------|------|-----|------|------|-----|------|------|------|------|
|                  |                | IND            | NAV | REC1 | REC2 | COMM | BIOL | EST | WILD | RARE | MAR | AQUA | MIGR | SPWN | WARM |
| <b>Shoreline</b> |                |                |     |      |      |      |      |     |      |      |     |      |      |      |      |
| Scripps (906.30) | Pacific Ocean  | •              | •   | •    | •    | •    | •    |     | •    | •    | •   | •    | •    |      | •    |

Notes:  
 AQUA = Aquaculture, BIOL = Preservation of Biological Habitats of Special Significance, COMM = Commercial and Sportfishing, EST = Estuarine Habitat, IND = Industrial Supply, MAR = Marine Habitat, MIGR = Fish Migration, NAV = Navigation, RARE = Preservation of Rare and Endangered Species, REC1 = Water Contact Recreation, REC2 = Non-Contact Water Recreation, SHELL = Shellfish Harvesting, SPWN = Fish Spawning, WARM = Warm Water Habitat, WILD = Wildlife Habitat  
 • Existing Beneficial Use  
 Source: Water Quality Control Plan for the San Diego Basin (9) (Basin Plan) (California Regional Water Quality Control Board, San Diego Region [SDRWQCB] 2007).

**5.5 Constraints**

This program has the following procedural and logistical constraints:

- A current IHA Permit is required to perform monitoring at Children's Pool Beach. The IHA Permit may include additional constraints not explicitly listed herein.
- Field teams will not be mobilized during or near certain holidays if the mobilization or laboratory analyses should continue through that holiday. This includes the following holidays:
  - Independence Day
  - Labor Day
  - Thanksgiving

All other typical statutory holidays occur during the prescribed pupping season and are not applicable.

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Figure 5-1. Children's Pool

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## 6.0 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

Data quality will be assessed using measurement quality objectives (MQOs) such as accuracy, precision, and completeness. The applicable MQOs are provided for each analysis type in Table 6-1. Measurement quality objectives for laboratory analyses are provided in Table 6-2. Measurement quality objectives for field samples are provided in Table 6-3. Details on DQOs and how they are measured are provided below.

**Table 6-1.  
 Measurement Quality Objectives**

| Measurement or Analysis Type | Applicable Data Quality Indicators |
|------------------------------|------------------------------------|
| Laboratory – Bacteria        | Accuracy, Precision, Completeness  |
| Laboratory – Total Mercury   | Accuracy, Precision, Completeness  |

Accuracy is a measurement of the closeness of a test value to the true or reference value. Accuracy can be measured in the laboratory using positive and negative controls.

Precision is a measurement of the repeatability of test measurements. Precision can be measured in the laboratory using laboratory replicates. Precision can be measured in the field using field duplicates. Relative percent differences (RPDs) will be calculated to determine the precision between duplicate samples. This calculation is shown below:

$$RPD = \frac{abs[x_1 - x_2]}{0.5 \times (x_1 + x_2)} \times 100$$

where:

$x_1$  is the primary sample concentration;  $x_2$  is the duplicate sample concentration.

Completeness is a measurement of the percentage of project-specific data that are valid. Percent completeness will be calculated by dividing the number of useable sample results by total number of sample results planned. This calculation is:

$$Completeness = \frac{\text{Actual Number of Samples Collected (Valid Results)}}{\text{Project Required Total Samples Planned (Number of Sample Results Planned)}} \times 100$$

**Table 6-2.  
 Measurement Quality Objectives for Laboratory Data**

| Group    | Parameter           | Accuracy   | Precision <sup>(a)</sup> | Completeness |
|----------|---------------------|--|--------------------------|--------------|
| Bacteria | <i>Enterococcus</i> | Positive control and reference material = 80-120% recovery.<br>Negative control = no growth on filter. | Lab Replicate<br>RPD<25% | 90%          |
|          | Fecal coliform      |  |                          |              |
|          | Total coliform      |  |                          |              |
| Metal    | Total Mercury       | Matrix Spike (75-125% recovery)<br>Reference Material (75-125% recovery)                               | Lab Replicate<br>RPD<25% | 90%          |

Notes:

mL = milliliters; MPN = most probable number; RPD = Relative Percent Difference

a. Not applicable, if native concentration of either sample is less than Reporting Limit (RL).

b. The target reporting limits are consistent with methodology of the Assembly Bill (AB) 411 program to facilitate overlap with that program. However, reporting limits may be lower depending on the lab used to conduct the analysis.

**Table 6-3.  
 Measurement Quality Objectives for Field Samples**

| Group    | Parameter           | Precision <sup>(a)</sup> | Completeness |
|----------|---------------------|--------------------------|--------------|
| Bacteria | <i>Enterococcus</i> | Lab Replicate<br>RPD<25% | 90%          |
|          | Fecal coliform      |                          |              |
|          | Total coliform      |                          |              |
| Metal    | Total Mercury       | Lab Replicate<br>RPD<25% | 90%          |

Notes:

RPD = Relative Percent Difference

a. Not applicable, if native concentration of either sample is less than Reporting Limit (RL).

## 7.0 SPECIAL TRAINING NEEDS/CERTIFICATION

### 7.1 Specialized Training or Certifications

All project field staff members are required to receive training on sampling standard operation procedures (SOPs) and safety procedures prior to engaging in any field activities. Field staff will also be required to receive marine mammal training from a NOAA Fisheries scientist before conducting field activities. Field staff will annually review the following:

- Sampling procedures in accordance with the QAPP
- Safety procedures, site hazards, and safety awareness in accordance with the Sampling Agency's Health and Safety Plan.
- NOAA marine mammal PSO training

### 7.2 Training and Certification Documentation

Amec Foster Wheeler will maintain records of training as detailed in Table 7-1. Documentation includes the date of training, the topic, the instructor name, and list of trainees.

**Table 7-1.  
 Specialized Personnel Training or Certification**

| <b>Specialized Training Course Title or Description</b> | <b>Training Provider</b>  | <b>Personnel Receiving Training/Organizational Affiliation</b> | <b>Location of Records and Certification<sup>(a)</sup></b> |
|---|---------------------------|--|--|
| Sampling SOPs and Health and Safety Training            | Amec Foster Wheeler       | Field Staff (Amec Foster Wheeler)                              | 9210 Sky Park Ct, San Diego, CA 92123                      |
| NOAA Marine Mammal PSO Training                         | Qualified Biologist (TBD) | Field Staff (Amec Foster Wheeler and City Storm Water)         |  |

Notes:

- a. If training records and/or certification are on file elsewhere, then document their location.

### 7.3 Training Personnel

Field staff will be trained on proper procedures for sampling, post-sampling processing, and sample handling in accordance with the QAPP and Monitoring Plan. The Amec Foster Wheeler Project Manager is responsible for training employees prior to the start of sampling, and to conduct any training sessions as needed throughout the course of the program.

Trained laboratory analysts will perform sample analysis for this program.

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## 8.0 DOCUMENTS AND RECORDS

Documentation and recordkeeping are essential for project organization, consistency, and data verification. There are many types of documents and records required by this project. Table 8-1 identifies the document and record types, the locations where they will be retained and archived, and their respective dispositions. Final and revised versions of the QAPP will be distributed to the Responsible Party (Section 3.0), analytical laboratory, and sampling agency.

**Table 8-1.  
 Documents and Record Retention, Archival, and Disposition Information**

| Documentation Category | Identify Type Needed  | Retention                                   | Archival  | Disposition     |
|------------------------|---|---|---|-----------------|
| Project Plans          | QAPP  | Project Manager                             | Document/Portable Document Format (*.pdf)               | Minimum 5 years |
|                        | Monitoring Plan   | Project Manager                             | Document/*.pdf  | Minimum 5 years |
| Sampling Records       | Water Sampling Field Data Sheets/ Electronic Data Deliverable (EDD) | Amec Foster Wheeler                         | Field Notebook/ *.pdf/ Excel Spreadsheet                | Minimum 5 years |
|                        | Training Records  | Amec Foster Wheeler                         | Field Notebook/ *.pdf                                   | Minimum 5 years |
|                        | Photographs   | Amec Foster Wheeler                         | Field Notebook/ Joint Photographic Experts Group (JPEG) | Minimum 5 years |
| Analytical Records     | Chain-of-Custody  | Analytical Laboratory                       | Field Notebook/ *.pdf                                   | Minimum 5 years |
|                        | Laboratory Reports  | Analytical Laboratory                       | *.pdf /Microsoft Excel spreadsheet                      | Minimum 5 years |
|                        | EDD   | Analytical Laboratory                       | Excel spreadsheet or Database                           | Minimum 5 years |
| Data Records           | Corrective Action Forms   | Amec Foster Wheeler / Analytical Laboratory | *.pdf   | Minimum 5 years |

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## **GROUP B: DATA GENERATION AND ACQUISITION**

### **9.0 SAMPLING DESIGN**

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This section provides an overview of the sampling design. The Monitoring Plan provided details of the sampling design.

#### **9.1 Project Description and General Design**

During a sampling event, three transects parallel to the shoreline at the swash zone, the high-tide line, and the supralittoral zone will be established relative to the seawall railing and three surface sand (SS) FIB samples (top 2 centimeters) will be collected across each of the transects at approximately left, middle, and right beach. GPS coordinates will be recorded for each sample collected along the transects. In addition, subsurface sand (SbS) FIB samples will also be collected at three of the nine SS sampling locations during each event at approximately 25–50 centimeters below the surface. Additional adaptive FIB samples will be collected to document event-specific conditions, such as areas recently occupied by pinnipeds, areas of wrack deposits, or additional depths at existing sampling locations.

#### **9.2 Sampling Locations**

Beach sand samples will be taken from the beach at Children's Pool as well as from a reference beach, South Boomers Beach (32.847557°, -117.278485°). Boomers Beach lies directly north of Children's Pool at the southern end of Ellen Browning Scripps Park and is rarely used as a haul out location by marine mammals. Number of samples and events are detailed in Section 5.1.2 and 5.1.3.

Figure 9-1 presents the sampling locations for the sand study.

#### **9.3 Laboratory Distribution**

Laboratories will be ready to receive, preserve, and analyze bacteria and metal samples as necessary according to this QAPP. Sample collection may be timed so that sample collection will occur during daylight hours and delivery will occur during business hours Monday through Friday (holidays excluded). Additional details regarding sampling handling and distribution are provided in Section 11.0.

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Figure 9-1. Children's Pool Sampling Locations

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## **10.0 SAMPLING METHODS**

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Samples will be collected and analyzed for the analyses listed in Table 5-1. The collection of samples for FIB analyses will follow sampling protocols outlined in "Standard Operating Procedures (SOP) for the Collection of Bacteria Samples from Storm Drains and Receiving Waters (Creeks, Lagoons, Bays, and Ocean)" used by the San Diego Copermittees for the Coastal Storm Drain and Lagoon Monitoring (County of San Diego, 2007).

### **10.1 Field Observations and Documentation**

Field observations will be recorded during each sampling event to record site conditions and actions taken during sampling. Field data sheets will be used to record general observations and potential sources of bacteria located within the vicinity of the site. General observations include weather, debris/trash observed, color and clarity of the water, odor, and any other conditions of interest. Potential sources of bacteria will be identified, including human-related sources, activities, and natural sources.

The following general information should be recorded on a field data sheet during each site visit:

- Site identification (ID)
- Monitoring project name
- Field team personnel
- Weather conditions
- Runoff characteristics
- Water quality observations
- Grab sample IDs
- Grab sample date/time
- Miscellaneous comments
- 

### **10.2 Sand Sampling**

During the first three sampling events (Phase 1a), three transects parallel to the shoreline at the swash zone, the high-tide line, and the supralittoral zone will be established relative to the seawall railing and three surface sand (SS) FIB samples (top 2 centimeters) will be collected across each of the transects at approximately left, middle, and right beach (Figure 2-1). In addition, subsurface sand (SbS) FIB samples will also be collected at three of the nine SS sampling location during each event at approximately 25–50 centimeters below the surface. Additional adaptive FIB samples will be collected to document event-specific conditions, such as areas recently occupied by pinnipeds, areas of wrack deposits, or additional depths at existing sampling locations.

#### **10.2.1 Sample Handling**

The following sample handling protocols will be followed when collecting samples to minimize the possibility of contamination. Further information regarding sample handling and custody is provided in Table 11-1:

- Field personnel will be thoroughly trained in the proper use of sample collection gear.

- Unused (new), clean, powder-free nitrile gloves will be worn while collecting samples and will be replaced with new, clean gloves between samples and sites.
- New, sterile 50-milliliter polypropylene (Falcon) tubes and sterile spatulas will be used to collect sand samples aseptically for analysis of FIB. Sand samples for analysis of mercury will be collected directly into laboratory-provided containers. Tubes, spatulas and caps will be protected from contact with solvents, dust, or other contaminants during storage and handling.
- The inside of the sampling container and lids will not be touched during preparation and sampling activities.
- New bags of previously unopened ice will be used to cool samples following sample collection.

Once sample containers are filled, containers destined for FIB analysis will be promptly placed on ice, in a clean cooler (maximum temperature of 10 degrees Celsius) in the dark and transported to the City of San Diego EM&TS laboratory for processing to meet holding times.

## 11.0 SAMPLE HANDLING AND CUSTODY

All bottles will be pre-labeled with the following information:

- Project name
- Date
- Time
- Sampling location name and number
- Sample matrix
- Collector's initials
- Sample ID number
- Analysis name

Samples will be marked with a unique sample ID that will be used to track the sample throughout its analyses. These sample IDs are also entered directly on to field and laboratory data sheets. All field observations and processed sample information will be recorded and transcribed to Microsoft Excel spreadsheets. Hard copies of these field and laboratory data sheets will be maintained by the responsible agency.

Once sample containers for FIB analyses are filled, they will be placed on ice, in a cooler, in the dark and transported to City of San Diego EM&TS laboratory for processing. Sand samples for analysis of mercury will be held at room temperature and shipped to Eurofins-Calscience. The chain-of-custody (COC) form will accompany the collected samples. Sand samples for FIB analyses will be kept below 10 degrees Celsius and transferred to an analytical laboratory within holding times. COC forms for the samples will be completed and transported with the samples to the analytical laboratory. Transportation will be coordinated to ensure that all samples are handled and analyzed within the proper holding time. Sample holding times are in Table 11-1. Custody of all samples will be transferred from the field personnel to laboratories.

**Table 11-1.  
 Sample Handling and Custody**

| Analysis            | Container  | Minimum Sample Volume | Initial Preservation              | Holding Time   |
|---------------------|--|-----------------------|-----------------------------------|--|
| <i>Enterococcus</i> | New, sterile 50-mL polypropylene centrifuge tubes      | 50 mL                 | < 10°C in the dark <sup>(b)</sup> | 8 hours  |
| Fecal coliform      |  |                       |                                   |  |
| Total coliform      |  |                       |                                   |  |
| Total Mercury       | To be provided by the laboratory (Eurofins-Calscience) | TBD                   | None                              | 48 hours before acidification; 90 days following acidification |

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## 12.0 ANALYTICAL METHODS

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The laboratory analyses and the analytical methods are provided in Table 12-1.

**Table 12-1.  
 Laboratory Analytical Methods**

| Analyte        | Laboratory          | Project Reporting Limit | Analytical Method     |                              |
|----------------|---------------------|-------------------------|-----------------------|------------------------------|
|                |                     |                         | Analytical Method/SOP | Modified for Method (yes/no) |
| Enterococcus   | EM&TS               | NA <sup>a</sup>         | EPA 1600              | Yes <sup>b</sup>             |
| Fecal Coliform | EM&TS               | NA <sup>a</sup>         | SM 9222D              | Yes <sup>b</sup>             |
| Total Coliform | EM&TS               | NA <sup>a</sup>         | SM 9222B              | Yes <sup>b</sup>             |
| Total Mercury  | Eurofins-Calscience | 0.00587 mg/kg           | EPA 7471A             | No                           |

Notes:

MDL = method detection limit; TBD = to be determined

- a. Because bacteria levels are being measured from sand samples, the values reported are not directly comparable with existing water quality reporting limits or water quality objectives. The results will provide a relative magnitude of FIB concentrations in beach sand from which appropriate recommendations may be made.
- b. Sand samples will be analyzed for FIB in accordance with the Southern California Coastal Water Research Project (SCCWRP) sand protocol (SCCWRP, 2009).

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### 13.0 QUALITY CONTROL

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This section addresses QA/QC activities associated with both field sampling and laboratory analyses. The field QC samples are used to evaluate potential contamination and sampling error introduced prior to submittal of samples to the analytical laboratory. Laboratory QA/QC activities provide information needed to assess laboratory contamination, analytical precision, and analytical accuracy. If any QA/QC standards are not met, the appropriate corrective actions will be taken in accordance with Section 22.0 of this document and the laboratories' QA Manuals. The Project Manager is responsible for making decisions on corrective actions pertaining to laboratory analysis. If issues are identified by Amec Foster Wheeler staff, the Laboratory Project Manager or Project Manager will be notified immediately and documentation of the issue and the corrective action will be made.

#### 13.1 Quality Control Types

A set of QC samples will be submitted to the laboratory on the basis of the frequencies noted in Section 5.1.1.2. The analytical laboratory may also require more QC samples if one type of analysis is to be run in more than one batch. The main types of QC samples that will be utilized for this study include field duplicates, laboratory replicates, and positive and negative controls.

The duplicate samples and laboratory replicates may be collected from different sites during a particular sampling event. The number and frequency of field QC samples to be collected are presented in Table 13-1. Field QC samples will be submitted blind to the analytical laboratory. For laboratory replicates, additional sample volumes will be collected and it will be clearly identified on the COC form.

#### 13.2 Field Quality Control Samples

##### Field Duplicates

Duplicate samples consist of two distinct samples (an original and a duplicate) of the same matrix collected at the same time and location using the same sampling technique. Field duplicate samples will be collected by filling two grab sample containers at the same time, or in rapid sequence. The purpose of field duplicates is to measure the consistency of field sampling. The project frequency for field duplicates is 10 percent of samples. The result for each field duplicate will be compared to the sample result to estimate a RPD between the two sample results. The RPD between the two results will be calculated using the RPD equation provided in Section 6.0.

Table 13-1 presents summary of field quality control criteria.

**Table 13-1.  
Field QC**

| Field QC        | Frequency                  | Acceptance Limit                     |
|-----------------|----------------------------|--------------------------------------|
| Field Duplicate | 10% of all project samples | RPD range of 0-25% <sup>(a)(b)</sup> |

Notes:

- a. For coliforms: within 95% confidence interval as defined by IDEXX Laboratories.
- b. Not applicable (NA) if native concentration of either sample is less than the RL.

### 13.3 Laboratory Quality Control

Laboratory QC samples include laboratory replicates, matrix spikes, positive and negative controls as described below. Laboratory QC sample results will be provided in a laboratory report and electronic data deliverable (EDD) with a batch ID number to correlate with the corresponding environmental sample data set. Table 13-2 describes the frequencies quality control samples for each constituent category. Quality control objectives are presented in Section 6.0

- **Laboratory Replicate** – For a laboratory replicate, a sample is prepared and analyzed twice to assess the repeatability (precision). The results are evaluated by calculating the RPD between the two sets of results. This serves as a measure of the reproducibility, or precision, of the sample analysis.
- **Matrix Spike and Matrix Spike Duplicates (Metals Only)** – Matrix spikes and matrix spike duplicates involve adding a known amount of the analyte(s) of interest to one of the actual samples being analyzed. One sample is split into three separate portions. One portion is analyzed to determine the concentration of the analyte in question in an unspiked state. The other two portions are spiked with a known concentration of the analytes of interest. The recovery of the spike, after accounting for the concentration of the analyte in the original sample, is a measure of the accuracy of the analysis. An additional precision measure is made by calculating the RPD of the duplicate spike recoveries. Both the RPD values and spike recoveries are compared against accepted and known method dependent acceptance limits. Results outside these limits are subject to corrective action.
- **Positive and Negative Controls (Bacteria Only)** – A negative control is created as a separate plate count after the buffered rinse water is filtered and incubated the same way as a sample. There should be no bacteria growth on the filter after incubation. It is used to detect laboratory bacterial contamination of the sample. A positive control is created as a separate plate count after a water sample known to contain bacteria (such as wastewater treatment plant influent) is filtered and incubated the same way as a sample. There should be bacteria growth on the filter after incubation. It is used to detect procedural errors or the presence of contaminants in the laboratory analysis that might inhibit bacteria growth (United States Environmental Protection Agency [USEPA] 2012).
- **Laboratory Control Sample (Metals Only)** – The laboratory control sample procedure involves spiking known amounts of the analyte of interest into a known, clean, sample matrix to assess the possible matrix effects on spike recoveries. High or low recoveries of the analytes in the matrix spikes may be caused by interferences in the sample. Laboratory control samples assess these possible matrix effects since the LCS is known to be free from interferences.

- **Method Blank**– A method blank is an analysis of a known clean sample matrix that has been subjected to the same complete analytical procedure as the field sample to determine if potential contamination has been introduced during processing. Blank analysis results are evaluated by checking against reporting limits for that analyte. Results obtained should be less than the reporting limit for each analyte.

**Table 13-2.  
 Laboratory Quality Control Frequencies**

| Group    | Parameter           | Laboratory Replicate   | Matrix Spike | Positive Control/<br>Laboratory Control<br>Sample                  | Negative Control/<br>Method Blank |
|----------|---------------------|--|--------------|--|-----------------------------------|
| Bacteria | <i>Enterococcus</i> | Per 10 samples or per analytical batch, whichever is more frequent | NA           | Per 10 samples or per analytical batch, whichever is more frequent |                                   |
|          | Fecal coliform      |  |              |  |                                   |
|          | Total coliform      |  |              |  |                                   |
| Metal    | Total Mercury       | Per 20 samples or per analytical batch, whichever is more frequent |              |  |                                   |

Notes:

- a. Not applicable, if native concentration of either sample is less than Reporting Limit (RL).  
 RPD = Relative Percent Difference

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#### **14.0 INSPECTION/ACCEPTANCE OF CONSUMABLES AND SUPPLIES**

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All glassware, sample bottles, and collection equipment will be inspected prior to use. All ordered supplies will be examined for damage as they are received. Bottles and caps will be inspected for damage prior to sampling, and only sound containers will be used. The container caps will be tested for tightness prior to transport of samples.

Amec Foster Wheeler will ensure sufficient field supplies are on hand prior to the start of sampling for each period. Field supplies will be stored at Amec Foster Wheeler's offices. Laboratory supplies will be stored at the laboratories conducting the work. Table 14-1 presents the acceptance criteria for consumables and supplies that will be used for this study.

**Table 14-1.  
 Inspection/Acceptance Testing Requirements for Consumables and Supplies**

| <b>Project-Related Supplies/Consumable</b> | <b>Inspection/Testing Specification</b> | <b>Acceptance Criteria</b>    | <b>Frequency</b> | <b>Responsible Individual</b> |
|--|---|-------------------------------|------------------|-------------------------------|
| Precleaned sample containers               | Open container                          | Lids screwed on bottles/tubes | 100%             | Sampling Agency               |
| Laboratory glassware                       | Dirty                                   | Clean                         | 100%             | Laboratories                  |

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## **15.0 INSTRUMENT CALIBRATION**

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There are no field measurements included in the Children's Pool Fecal Indicator Bacteria and Mercury Sand Study at this time. This section is included as a place holder for future optional monitoring.

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## **16.0 NON-DIRECT MEASUREMENTS**

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The City conducts water quality monitoring at Children's Pool as part of the Scripps HA Bacteria TMDL compliance monitoring program. Data collected under this program may be leveraged for the assessment of sand quality at Children's Pool Beach. This program is described in depth in the Scripps Bacteria TMDL Monitoring Program and QAPP documents (City of San Diego, 2012a,b).

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## **17.0 DATA MANAGEMENT**

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Data will be submitted in a standardized SWAMP-compatible format. Amec Foster Wheeler will compile the monitoring data and the laboratory will compile analytical data. A final data will be provided to the Responsible Party.

### **17.1 Field Observations**

Amec Foster Wheeler will review all field data sheets for completeness, maintain the original hardcopies, and scan electronic copies to \*.pdf format for storage in the project file. Field data sheets will be transcribed into an electronic spreadsheet. Photographs of the monitoring sites taken by field personnel will be uploaded into the project file within three business days of field visits. Field team members will name the photographs using the site ID and the date the photo was taken. Copies of field data sheets and photographs for each event will be submitted to the Project Manager with the quarterly sampling summary.

### **17.2 Analytical Data**

Laboratories will provide data in \*.pdf, hardcopy, and SWAMP-compatible EDD. A SWAMP-compatible EDD will ensure that the data files can be uploaded to the SWAMP regional database. The Project Manager will review all lab reports and EDDs for accuracy, completeness, and SWAMP compatibility. Analytical results will be submitted to the Project Manager within three weeks of submittal of samples.

Within two weeks of receipt, the Project Manager will screen preliminary data deliverables for the following major items:

- A 100-percent check between electronic data provided by the laboratory and the hard copy reports
- Conformity check between the COC forms and laboratory reports
- A check for laboratory data report completeness
- A check for typographical errors on the laboratory reports
- A check for suspect values, data qualifiers, and review of laboratory QC data

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## GROUP C: ASSESSMENT AND OVERSIGHT

### 18.0 ASSESSMENT AND RESPONSE ACTIONS

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The Project Manager will be responsible for the day-to-day oversight of monitoring activities, laboratory analyses, and/or data reporting. Any failures (e.g., instrument failures) that occur during data collection and/or laboratory analyses will be the responsibility of the field crew or laboratory conducting the work, respectively. It is the responsibility of the Laboratory's QA Officer and Sampling Agency's Project Manager to report any assessments and proposed corrective actions to the Lead Agency's Project Manager. The Project Manager will relay deviations to the Project's QA Officer. The Project's QA Officer has the authority to stop all sampling and analytical work if the deviations noted are considered detrimental to data quality. The following section describes how deviations from the QAPP will be identified.

Three types of assessments will be performed as part of this project to ensure that the sampling and analysis activities are in accordance with the approved QAPP. Assessment activities and results will be documented in writing first by field or laboratory reports, then in final reporting. They are as follows:

- **Surveillance of Sample Collection Activities:** The Project Manager will be responsible for oversight of sampling activities and will review field datasheets to verify that the samples were collected in accordance with QAPP requirements. If the Sampling Agency identifies any of the field activities to be in violation of QAPP requirements, the Project Manager will be contacted immediately. The Project Manager has the authority to stop field activities until corrective actions are successfully implemented. Corrective actions may include additional training to improve field team performance and QAPP compliance, or appropriate resampling of sites, as needed. Any corrective actions will be documented. Any actions necessary will be communicated to the Project Manager.
- **Data Quality Assessment:** Each Laboratory Manager will be responsible for providing a summary of QC data to the Sampling Agency's Project Manager. If it is determined that the precision and accuracy objectives were not met, the Sampling Agency's Project Manager will notify the Laboratory Manager. Laboratory techniques will be reviewed to minimize errors, and samples will be reanalyzed, if possible.
- **Assessment of Data Entry:** Once the performance criteria are met, the Sampling Agency's Project Manager will review data files to ensure that errors are detected and corrected. The Project Manager will retain original data files; qualified data will be retained by the Contract Manager in a database. Data are qualified in the database according to SWAMP protocols.

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**19.0 REPORTS TO MANAGEMENT**

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Amec Foster Wheeler will provide sampling summaries to the Contract Manager as a status of monitoring activities upon request. Additionally, a draft technical memorandum will be prepared following completion of sampling and analysis. Table 18-1 presents the required management reports.

**Table 19-1.  
 Management Reports**

| <b>Type of Report</b>      | <b>Frequency<br/>(Daily, weekly,<br/>monthly, quarterly,<br/>annually, etc.)</b> | <b>Projected<br/>Delivery Dates</b> | <b>Person(s)<br/>Responsible for<br/>Report<br/>Preparation</b> | <b>Report<br/>Recipients</b> |
|----------------------------|--|-------------------------------------|---|------------------------------|
| Sampling Summary           | Upon Request   | Upon Request                        | Project Manager   | City of San Diego            |
| Draft Technical Memorandum | Upon Completion of Sampling and Analysis   | FY2017                              | Project Manager   | City of San Diego            |

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## **GROUP D: DATA VALIDATION AND USABILITY**

### **20.0 DATA REVIEW, VERIFICATION, AND VALIDATION**

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All analytical data will be reviewed and compared to the DQOs described in Section 6.0 of this QAPP, along with the applicable QA/QC practices. If results fail to meet any DQO, the Sampling Agency's Project Manager will flag them for further review. Batch QC samples will be reviewed to determine the potential cause of failure to meet the DQO. Data will be separated into three categories: data meeting all DQOs (acceptable data), data failing precision or recovery criteria (further investigation warranted), and data failing to meet accuracy criteria (further investigation warranted).

If further investigation is warranted based on data failing precision or recovery criteria, all aspects of the data will be assessed for data quality by the Project Manager. At that point, the data will either be accepted or rejected. If accepted, the data will be flagged with a "J" qualifier per the EPA specifications (USEPA 2002). If data fail to meet accuracy criteria, or the cause of the failure cannot be identified and rectified, the data will be excluded from the results. All rejected data will be retained in the Project database, and qualified as "rejected." The ultimate decision of whether to accept or reject a data point will be made by the Project Manager in consultation with the Project QA Officer.

If the analysis for more than ten percent of data fails to meet the DQO, the Project Manager and Project QA Officer will meet to discuss the appropriateness of the DQO and any potential modifications. All proposed modifications of DQOs will require a reissuance of the QAPP.

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## **21.0 VERIFICATION AND VALIDATION METHODS**

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Data verification is the process of evaluating the completeness, correctness, and conformance of the dataset against the method, procedural, or contractual requirements. The goal of data validation is to evaluate whether the data quality goals established during the planning phase have been achieved. Data quality indicators will be continuously monitored by the analyst producing the data (i.e., field and lab personnel), as well as the Laboratory or Sampling Agency's Project Manager throughout the project to ensure that corrective actions are taken in a timely manner. Data validation is an analyte-specific and sample-specific process that extends verification to determine the analytical quality of the dataset. Laboratory and field personnel responsible for conducting QC analysis will be responsible for documenting when data do not meet measurement quality objectives as determined by data quality indicators.

### **21.1 Data Verification and Validation Responsibilities**

Data collected in the field will be verified by the Project Manager. The laboratories will maintain COC records and sample manifests.

Verification and validation of laboratory data is the responsibility of the laboratory section supervisor and Project Manager. Laboratories will maintain analytical reports including QC documentation. The Laboratory QA Officer will perform checks of all of its records.

The Project QA Officer and Project Manager are responsible for oversight of field data and laboratory data obtained from the contracted laboratory and sampling agency. All data records will be checked visually and recorded as checked by initials and dates.

Reconciliation and correction of any data that fails to meet the DQOs will be done by the Project Manager in consultation with the Laboratory QA Officer and/or Sampling Agency's Project Manager. Any corrections require a unanimous agreement that the correction is appropriate.

### **21.2 Process for Data Verification and Validation**

Data verification and validation for sample collection and handling activities will consist of the following tasks:

- Verification that the sampling activities, sample locations, number of samples collected, and type of analysis performed is in accordance with QAPP requirements
- Documentation of any field changes or discrepancies
- Verification that the field activities and field data (including sample location, sample type, sample date and time, name of field personnel, etc.) were properly documented
- Verification of proper completion of sample labels and COC forms, and secure storage of samples
- Verification that all samples recorded on COC forms were received by the laboratory

Data verification and validation for the sample analysis activities will include all of the following:

- Verification that appropriate methodology has been followed
- Verification that instrument calibrations have been adequately conducted
- Verification that QC samples meet performance criteria
- Verification that analytical results are complete
- Verification that documentation is complete

Verification and validation of data entry includes:

- Sorting data to identify missing or mistyped (too large or too small) values
- Double-checking all typed values
- Verifying that correct data types correspond to database fields (i.e., text for text, integers for integers, number for numbers, dates for dates, times for times, etc.)

## **22.0 RECONCILIATION WITH USER REQUIREMENTS**

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The data will be qualified if QA issues are identified. Statistics and reporting of standard deviation and relative error will be used to quantify the uncertainty associated with the data. Uncertainty and limitations on data use will be described in the draft technical memorandum.

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## 23.0 REFERENCES

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Draft Monitoring Plan for the Children's Pool  
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## **APPENDIX B**

### **CHILDREN'S POOL PROTECTED SPECIES OBSERVER FIELD MONITORING FORM (DRAFT)**

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Draft Monitoring Plan for the Children's Pool  
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**Field Monitoring Form (FMF)**

PSO  Date  Time Mitigation Monitoring Start/End  /   
 Samplers  Time Sample Collection Start/End  /

**First Count (Pre-Sample Collection) Time:**

Beaufort Sea State 1 2 3 4 5 6 7 8 9 10 11 12 Air Temp °C  
 Tide Status Rising Falling High Low Tide Height ft Water Temp °C  
 Weather Sunny Partly Cloudy Overcast Fog Raining Drizzle  
 Last Rain > 72 Hours < 72 Hours Rainfall None < 0.1" > 0.1"  
 Study Area Visibility Low (≤ 30 meters) Medium (31-99 meters) Full (≥ 100 meters) Photos Taken? Y N  
 Number of Public Visitor: Total \_\_\_\_\_ = On the Beach \_\_\_\_\_ + On the Seawall \_\_\_\_\_ + Other \_\_\_\_\_

**Comments**

**Last Count (Post-Sample Collection) Time:**

Beaufort Sea State 1 2 3 4 5 6 7 8 9 10 11 12 Air Temp °C  
 Tide Status Rising Falling High Low Tide Height ft Water Temp °C  
 Weather Sunny Partly Cloudy Overcast Fog Raining Drizzle  
 Last Rain > 72 Hours < 72 Hours Rainfall None < 0.1" > 0.1"  
 Study Area Visibility Low (≤ 30 meters) Medium (31-99 meters) Full (≥ 100 meters) Photos Taken? Y N  
 Number of Public Visitor: Total \_\_\_\_\_ = On the Beach \_\_\_\_\_ + On the Seawall \_\_\_\_\_ + Other \_\_\_\_\_

**Comments**

**PINNIPED COUNTS**

| Date | Time | Species             | Distance (m) | Total # | # Juv. | # Male | # Female | Comments |
|------|------|---------------------|--------------|---------|--------|--------|----------|----------|
|      |      | Pacific Harbor Seal |              |         |        |        |          |          |
|      |      | California Sea Lion |              |         |        |        |          |          |
|      |      | N. Elephant Seal    |              |         |        |        |          |          |
|      |      | Pacific Harbor Seal |              |         |        |        |          |          |
|      |      | California Sea Lion |              |         |        |        |          |          |
|      |      | N. Elephant Seal    |              |         |        |        |          |          |
|      |      | Pacific Harbor Seal |              |         |        |        |          |          |
|      |      | California Sea Lion |              |         |        |        |          |          |
|      |      | N. Elephant Seal    |              |         |        |        |          |          |
|      |      | Pacific Harbor Seal |              |         |        |        |          |          |
|      |      | California Sea Lion |              |         |        |        |          |          |
|      |      | N. Elephant Seal    |              |         |        |        |          |          |
|      |      | Pacific Harbor Seal |              |         |        |        |          |          |
|      |      | California Sea Lion |              |         |        |        |          |          |
|      |      | N. Elephant Seal    |              |         |        |        |          |          |
|      |      | Pacific Harbor Seal |              |         |        |        |          |          |
|      |      | California Sea Lion |              |         |        |        |          |          |
|      |      | N. Elephant Seal    |              |         |        |        |          |          |

Distance = Distance from PSO

Note additional findings when feasible (i.e. age estimates, health status, evidence of malnutrition or injury)

