

**EPHEMERAL AND AMBIENT DATA COLLECTION PLAN
MONTEREY BAY AND ELKHORN SLOUGH, CALIFORNIA**

2020



**California Department of Fish and Wildlife,
Office of Spill Prevention and Response,
Resource Restoration Branch**

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LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|----------------|---|
| BIOS | Biogeographic Information and Observation System |
| BTEX | Benzene, Toluene, Ethylbenzene, Xylene |
| COC | Chain-of-custody |
| CDFW-OSPR | California Department of Fish and Wildlife, Office of Spill Prevention and Response |
| EDCC | Ephemeral Data Collection Coordinator |
| EPA | U.S. Environmental Protection Agency |
| Ephemeral Data | Information that can only be collected within the narrow time frame of after a spill occurs and before the shoreline is impacted. |
| ERMA | Environmental Response Management Application |
| GC/FID | Gas Chromatography with Flame Ionization |
| GC/MS/SIM | Gas Chromatography-Mass Spectrometry with Selected Ion Monitoring |
| GPS | Global Positioning System |
| HAZWOPER | Hazardous Waste Operations & Emergency Response |
| ID | Identification |
| mL | Milliliter |
| NOAA | National Oceanic and Atmospheric Administration |
| NRDA | Natural Resource Damage Assessment |
| PAHs | Polycyclic Aromatic Hydrocarbons |
| PFD | Personal Floatation Devices |
| PIANO | Paraffins, iso-paraffins, aromatics, naphthenics and olefins |
| PPE | Personal Protective Equipment |
| QA/QC | Quality Assurance/Quality Control |
| RP | Responsible Party |
| SAP | Sampling and Analysis Plan |

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| SARA | Saturates, aromatics, resins and asphaltenes |
| TPH | Total Petroleum Hydrocarbons |
| USFWS | United States Fish and Wildlife Service |
| VOA | Volatile Organic Analysis |
| WCJAT | West Coast Joint Assessment Team |

EXECUTIVE SUMMARY

This Ephemeral Data Collection Plan (plan) describes and prioritizes ephemeral data collection by the Natural Resources Damage Assessment (NRDA) team in the event of an accidental release of oil along the Monterey County coastline or within Elkhorn Slough. The NRDA team will consist of representatives of the responsible party (RP) and the natural resource trustees (hereafter referred to as the 'Trustees'), including the California Department of Fish and Wildlife, Office of Spill Prevention and Response (CDFW-OSPR), the Department of the Interior (U.S. Fish and Wildlife Service [USFWS]), and/or the National Oceanic and Atmospheric Administration (NOAA). By developing and implementing this plan prior to an accidental release, it ensures that the baseline (pre-spill) condition data will be available and helps establish agreed upon sample locations and collection procedures to be implemented following a release. CDFW-OSPR prepared this plan based on reconnaissance and evaluation of high-risk locations.

Ephemeral data refer to information that may not be available if it is not collected within a narrow time frame. The primary goal of the plan is to collect ephemeral data that (1) documents existing, pre-oiling, conditions; (2) documents petroleum hydrocarbon concentrations in water, sediment, and selected marine organisms prior to and following an incident.

The key to successfully collecting ephemeral data (i.e., petroleum hydrocarbon concentrations in environmental media) during an accidental release is a well-designed and implementable ephemeral data collection plan. Therefore, the primary purpose of this plan is to describe notification procedures, sampling locations, sampling media, sampling procedures and chemical analysis objectives in the event of an accidental release along the Monterey County coastline or within Elkhorn Slough. Collection of ephemeral data aids in the understanding of environmental conditions prior to a release and is critical in identifying the need for, and scope of, subsequent environmental sampling and injury assessment. Having this plan in place prior to a release will facilitate the collection of critical environmental information during the early stages of response efforts.

A secondary purpose of this plan is to detail sampling locations, procedures, and chemical analysis objectives for the monitoring of surface water, sediment, and tissues that may be performed by CDFW-OSPR to evaluate pre-incident ambient conditions. There are many anthropogenic and natural sources of hydrocarbons in the environment. Baseline or ambient conditions (i.e., petroleum hydrocarbon concentrations in various media not associated with an accidental release) are assessed to gain an understanding of existing conditions to allow a more accurate evaluation of impacts should an incident occur in the future. The Trustees recognize that implementing an ephemeral data collection plan within hours of an incident may be problematic given the potential magnitude of released product (i.e., thousands of gallons of crude oil or refined fuels) and the limited resources and manpower available for this effort on a short 2-3 hour timeframe. Therefore, in order to provide some initial information on potential baseline chemical conditions along the Monterey County coastline and within Elkhorn Slough, CDFW-OSPR determined it was

appropriate to perform monitoring of ambient petroleum hydrocarbon concentrations in surface water, sediment, and tissues within this area beginning in the fall of 2019.

Before implementing this plan, representatives of the NRDA team will determine if incident circumstances warrant implementation of the plan, and, if so, any modifications to the plan that may be required. Also, during an incident, the ephemeral data collection procedures detailed in this plan may be modified following lessons learned from future oil spill response drills or real-time responses to accidental releases along the Monterey County coastline and within Elkhorn Slough.

Finally, the CDFW-OSPR recognize that other spills may occur along the Monterey County coastline and within Elkhorn Slough and may benefit from the sampling design and procedures described in this plan. In the event of a release, the Trustees may choose to implement this plan to assist them during NRDA pre-assessment and assessment activities.

1.0 INTRODUCTION

1.1 PURPOSE, GOALS, OBJECTIVES, FOCUS, AND SCOPE OF THE PLAN

- **Purpose:** (1) To expedite and detail procedures for collection of ephemeral source oil, surface water, sediment, and tissue samples in the event of an accidental release of petroleum into the coastal waters of Monterey County or within Elkhorn Slough. This plan describes notification procedures, sampling locations, sample media, sampling procedures and chemical analysis objectives in the event of a large accidental release of oil. (2) To detail procedures for collecting and analyzing petroleum hydrocarbon concentrations in surface water, sediment, and tissues for understanding baseline or ambient conditions present because of anthropogenic or natural releases of petroleum hydrocarbons into coastal Monterey County or Elkhorn Slough that are not associated with spills.
- **Goals:** To obtain data that will assist in determining the source of oil(s); document petroleum hydrocarbon concentrations in water, sediment, and selected marine organisms prior to and following an accidental release of oil near coastal Monterey County or Elkhorn Slough.
- **Objectives:** (1) To collect source oil, water, sediment, and tissue samples within the first hours, days, and weeks after an accidental release of oil near the Monterey County coastline or within Elkhorn Slough for petroleum hydrocarbon analysis; and (2) collect water, sediment, and tissue samples for understanding baseline petroleum hydrocarbon concentrations in coastal Monterey County locations and Elkhorn Slough locations. During an incident, there is a narrow window of opportunity for collection of these data, and, accordingly, they are referred to as “ephemeral” data (i.e., if the samples are not collected, the opportunity to collect them will be lost permanently). Ephemeral and baseline data can be critical in identifying the need for, and scope of, subsequent environmental sampling, and injury assessment.
- **Focus of Sample Collection and Chemical Analysis:** The following types of samples will have the highest priority: (1) source oil(s) to confirm petroleum fingerprint and for possible toxicological testing; (2) water, sediment, and tissues in areas not yet impacted (baseline conditions); (3) water, sediment and tissue within the impacted area to obtain information on the concentration of selected petroleum constituents in those media. Petroleum hydrocarbon analyses will be consistent with the U.S. Environmental Protection Agency (EPA) standard methods.
- **Scope:** To have a scalable sampling plan to adjust to the size of the incident, with sample locations pre-identified in the plan.
- **Study Area:** Coastal Monterey County, including Salinas River mouth, Elkhorn Slough, and state beaches.

Ephemeral data collection plan overview, ambient monitoring, communication among agency representatives and the unified command and field teams are described in Section 1. Procedures for collecting, storing, transporting, and documenting samples are detailed in Section 2. Chemical analyses and chain-of-custody are described in Sections 3 and 4. The key natural resource trustee representatives, technical support and chemical analysis contacts, and other state and local agency contacts are listed in Sections 5, 6, and 7. FedEx shipping locations are provided in Section 8 and directions to the listed sampling locations are provided in Section 9. Referenced material can be found in Section 10.

1.2 FACTORS AFFECTING EPHEMERAL DATA COLLECTION PLAN IMPLEMENTATION

1.2.1 Study Area and Special Considerations

Coastal Monterey County has the potential to be impacted by an oil spill from recreational and/or shipping vessels, accidental derailments, natural seeps and other sources. Railroad tracks parallel and/or cross portions of Elkhorn Slough, Moro Cojo Slough, and the Salinas River. The study area assessed spans north of Carmel River State Beach to upper Elkhorn Slough. Southern coastal Monterey County locations may also be affected; however, they were not included in this plan.

In 1992, the Monterey Bay National Marine Sanctuary was designated by NOAA. The Monterey County coastline is a dynamic environment consisting of sloughs, mudflats, dunes, sandy beaches, oak woodlands, pine and redwood forest, and marine areas. There are 17 marine protected areas (MPAs) designated as state marine conservation areas or state marine reserves. The sanctuary stretches from Rocky Point (7 miles north of the Golden Gate Bridge; Marin County, CA) to Cambria, CA, covering 276 miles of shoreline and 4,601 nmi² of ocean. Habitats within the sanctuary are home to 36 species of marine mammals, >180 species of seabirds and shorebirds, 525 species of fishes an abundance of invertebrates and algae. Oceanography of the Monterey Bay National Marine Sanctuary is tied to the California Current, which transports low salinity, cool water equatorward. This current is the eastward portion of the clockwise North Pacific Gyre. Its surface flow is poleward during the late fall and winter, whereas equatorward flow occurs during the spring and summer. In addition, the California Undercurrent flows northward along the continental slope and shelf. An accidental release of oil, or oil from natural seeps is likely to be transported out to sea or stranded along the shoreline. Impacts to the coastline will be dependent on tide and wind conditions.

In addition to MPAs, coastal Monterey County contains three large rivers that are important migration/movement corridors. Each of these rivers may be affected by an accidental release of oil.

- Salinas River – steelhead migration upstream to the Arroyo Seco River.
- Carmel River – steelhead, red-legged frogs and other wildlife movement.
- Pajaro River – steelhead migration upstream to the upper watershed reaches of Santa Clara County.

During and after an incident, the NRDA focuses on four primary questions: (1) what was injured, (2) what is the spatial extent of injury, (3) what is the degree of injury, and (4) what is the duration of injury. In addition, the time for injured resources to recover to their original or pre-release “baseline” is a critical component of the assessment. Ephemeral data collected before, during, and after the spill are essential to answer these questions. This plan provides a means to quantify pre-release “baseline” or “ambient” conditions before an area or coastline is impacted by an accidental release. Ambient conditions are represented by the chemical concentrations of anthropogenic (e.g., fossil fuel use) and naturally occurring seep oil or petroleum hydrocarbon constituents in water, sediment, and marine organisms (i.e., tissues). Storm water runoff, atmospheric deposition, boat traffic, and industrial releases of oil-related constituents into Monterey Bay all contribute to ambient levels of these chemicals.

1.2.2 Physical and Temporal Factors

Implementation of the ephemeral data collection, as detailed in this plan, including sampling site priorities (Appendix 1) will depend on three primary factors: (1) volume released, (2) time period between the release and when field teams can be mobilized to collect samples, and (3) predominant tidal current at the time of the release. Waves, wind, and storm water runoff are secondary forces, affected by seasonality and weather conditions. For purposes of implementing this plan, as discussed in Section 1.4, the NRDA Agency Lead(s) will confer to decide whether the magnitude of the release warrants the deployment of field teams to implement the plan. In deciding how to implement this plan and deciding on sampling location priorities, the NRDA Agency Lead(s) will consider the following:

- *Volume released:* If the volume of released product appears to have harmed or is likely to harm birds, fish, or other organisms, or appears to have compromised the usefulness of habitat for wildlife, it may be assumed that NRDA is a possibility and that trust wildlife resources may be affected. Field teams should be mobilized to begin gathering information and collecting time-critical data.
- *Time period between the spill and when field teams can be mobilized to collect samples:* If field teams are unable to collect samples within 6 to 12 hours following the release, depending on the magnitude, duration, weather conditions, and tidal currents, it may not be possible to sample bay or ocean shorelines before they are impacted. Therefore, as a contingency, this plan also includes an optional biennial baseline or ambient data collection plan as described in Section 1.3.
- *Predominant tidal current at the time of the release:* If the tidal influence is at high tide at the time of the release, it may be difficult to obtain any representative samples. Many of the selected sites require relatively low tides (- 2 ft) in order to sample both sediment and tissues.

1.2.3 Safety

Safety is the most important consideration in plan implementation. Field teams may encounter oil during collection of water, sediment, or biological samples. Personnel collecting data in the field should be at least 24-hour Hazardous Waste Operations & Emergency Response (HAZWOPER) certified if oil is present and have received permission from the Unified Command Site Safety Officer to enter impacted areas.

Before sampling in impacted areas, all field team members must read and be familiar with and follow the procedures specified in the site safety plan prepared by the Unified Command. Before going into the field, all field team members will receive a daily safety briefing from the Ephemeral Data Collection Coordinator (EDCC; discussed in detail in Section 1.4). Field team members collecting samples by boat will receive a boat safety briefing by the boat operator prior to leaving the dock. When on or near water, field team members will wear personal floatation devices (PFDs) at all times. Good judgment must be used at all times, particularly when considering fieldwork during inclement weather and collecting samples in the surf zone. No sampling will be conducted in the dark. While working on the shoreline, field team members should be mindful of slippery surfaces (e.g., rocks), sharp objects, the edge of cliffs and bluffs, and active railroad tracks. Field team members should wear sunglasses, sunscreen, appropriate footwear, and other personal protective equipment (PPE) as might be required by the safety officer.

PPE will depend on the specific hazardous petroleum materials and their concentrations. Under no circumstances should the field team enter uncharacterized, freshly impacted shorelines without proper training (i.e., 40-hour HAZWOPER certification) and combustible gas/hydrogen sulfide meters. Likewise, sampling in the impacted area will not be done if respirators are required or the safety officer deems the area unsafe. When collecting samples in the impacted area, field sampling team members will wear appropriate protective equipment (e.g., gloves, Tyvek, PFD). Nitrile gloves and cut-resistant gloves will be worn when sampling any medium of interest and will be changed between each sampling site. See Appendix 5 for further discussion of sampling procedures and health and safety requirements.

1.3 BIENNIAL AMBIENT MONITORING

As part of the preparation of this plan, samples were collected by CDFW-OSPR in October 2019 to begin documenting ambient or baseline conditions in the study area. Doing so was based on concerns about conditions (e.g., time of day when a spill might happen, traffic, availability of trained field team members) that may preclude or impede implementation of ephemeral data collection in the event of an actual accidental release.

The following locations (shown in Appendix 1 and 2), and sample types were collected:

Surface Water Grab Samples (1-liter sample per location)

- Kirby Park (N 36.83995° / W -121.74353°)
- Hummingbird Island (N 36.82360° / W -121.7427°)
- Moss Landing Wildlife Area (N 36.81318° / W -121.7801°)
- Moss Landing Harbor (N 36.807° / W -121.7877°)
- Salinas River Mouth (N 36.73216° / W -121.78298°)
- Marina State Beach (N 36.69857° / W -121.81008°)
- Monterey Bay's Fisherman's Wharf (N 36.60122° / W -121.88723°)
- Lover's Point (N 36.62565° / W -121.91612°)
- Asilomar State Beach (N 36.61987° / W -121.9417°)
- Carmel State Beach (N 36.53928° / W -121.93205°)

Sediment Samples (composite sample collected at mid intertidal; same general area as water samples)

- Kirby Park (N 36.83995° / W -121.74353°)
- Hummingbird Island (N 36.82360° / W -121.7427°)
- Moss Landing Wildlife Area (N 36.81318° / W -121.7801°)
- Moss Landing Harbor (N 36.807° / W -121.7877°)
- Salinas River Mouth (N 36.73216° / W -121.78298°)
- Marina State Beach (N 36.69857° / W -121.81008°)
- Monterey Bay's Fisherman's Wharf (N 36.60122° / W -121.88723°)
- Lover's Point (N 36.62565° / W -121.91612°)
- Asilomar State Beach (N 36.61987° / W -121.9417°)
- Carmel State Beach (N 36.53928° / W -121.93205°)

Tissue Samples (each sample is a composite of 15-25 individuals (e.g., mussels))

- Moss Landing Harbor (N 36.807° / W -121.7877°)
- Monterey Bay's Fisherman's Wharf (N 36.60198° / W -121.88957°)
- Lover's Point (N 36.62565° / W -121.91612°)
- Asilomar State Beach (N 36.6206° / W -121.9422°)
- Carmel State Beach (N 36.53928° / W -121.93205°)

Interpretation of statistical comparisons of these data to spill data (in the event one occurs) must take into consideration the sample size and geographic coverage of the sampling effort. Data, including site-specific information (GPS coordinates), sample specific information (date and time collected, matrix, etc.), and analytical chemistry results are available on CDFW's Biological Information and Observation System (BIOS; <https://www.wildlife.ca.gov/Data/BIOS>) and on NOAA's Southwest Environmental Response Management Application (ERMA; <https://response.restoration.noaa.gov/maps-and-spatial-data/environmentalresponse-management-application-erma/southwest-erma.html>).

1.4 COMMUNICATION AMONG AGENCY REPRESENTATIVES

After receiving notification of a release of greater than de minimis quantities, CDFW-OSPR will notify, to the extent feasible, the key RP and Natural Resource Trustee Agency Lead(s) or their alternates (Section 5). RP and Trustee Agency

representatives may coordinate to assess the circumstances and determine sampling priorities including what, if any, elements of the plan should be implemented, modified, or if additional monitoring elements should be considered. In the event of a large release that could potentially harm or threaten to harm birds, fish, or other organisms, or appears to have compromised or has the potential to compromise the usefulness of habitat for fish or wildlife, the RP and the Trustee Agencies can identify and mobilize the appropriate staff to initiate implementation of the plan. Key contacts for mobilizing field teams are identified in Section 5.0. If the RP and Trustee Agency Lead(s) are unreachable in the early hours/days of the spill, CDFW-OSPR Agency Lead(s) will begin coordinating initial sampling priorities and efforts, including implementation of this plan.

The RP, Trustee Agency Lead(s), or their alternates (Section 5), may participate in an initial conference call to determine the specific plan elements to be implemented, to share needed contact and location information and then to assign their respective staffs to participate in sample collection activities as appropriate. A Trustee EDCC, appointed by the NRDA Agency Lead(s), will be assigned to provide project oversight and management. The EDCC will manage implementation of this plan and coordinate with the Unified Command for the response (see Section 1.5), via the NRDA Representative, for increased efficiencies in all aspects of data collection for the response and the damage assessment.

1.5 RELATIONSHIP AND COMMUNICATION WITH THE UNIFIED COMMAND

The NRDA for an incident is done in parallel with the incident response but is a separate effort. The goals of response and NRDA are different. The goals of spill response are to stop and stabilize the source of the spill, remove oil from the environment, protect the safety and health of the responders and the public, and avoid or minimize harm to the environment. Whereas, the goal of NRDA is to identify the type and amount of restoration needed to restore injured natural resources.

Figure 1 details the response Incident Command Structure organization for a spill and the coordination points with NRDA. Since NRDA field assessment activities may overlap those of the response, close coordination and cooperation between the two efforts is necessary. The NRDA Agency Lead(s) are responsible for establishing the communication link with the Incident Command (i.e., Unified Command if the incident is federalized) via the NRDA Representative or Liaison as described in the West Coast Joint Assessment Team (WCJAT) guidance document (WCJAT, 2017) and the CDFW-OSPR Policy 603-1, Communication and Coordination between Natural Resource Damage Assessment (NRDA) and Incident Command Structure During Spill Response (2009). All communications with the Unified Command will be coordinated through the NRDA Representative.

The EDCC will prepare a General Message (*ICS 213*) to establish and document communications and resource requests between NRDA and the Planning Section (Environmental Unit) and the Operations Section (Wildlife Branch) of the Unified

Command. This will allow for the coordination of environmental sampling and field data collection activities between NRDA and the response. For example, when NRDA ephemeral data collection field teams are directed to sample in impacted areas, health and safety must be addressed and permission to enter impacted areas must be coordinated through the NRDA Representative and the EDCC. A General Message (*ICS 213*) will be provided to the Unified Command daily throughout the duration of the field activities or as appropriate based on the incident.

1.6 FIELD TEAMS

The EDCC makes field assignments, reviews and disseminates health and safety procedures, monitors all field activities, and provides the field team leaders with information containing specific guidelines (e.g., health and safety, sampling locations and sites, sample collection procedures, etc.) for implementing the plan. All personnel involved in implementation of the ephemeral data collection plan are responsible for reporting progress and results to the EDCC. The EDCC also will verify that all field sampling team members have read and signed a copy of the incident health and safety plan.

NRDA field teams, including representatives of the RP and/or the Trustees, may collect samples both offshore and onshore. To expedite the collection of samples, offshore and onshore field teams should be mobilized. The offshore teams should include an experienced boat operator and two other qualified people (i.e., people with experience or training for on-water sample collection): one to collect samples and the other to record notes and take photographs. The onshore sampling teams may consist of up to four people each: one to collect water and sediment samples, one to collect tissue, one to record notes, and one to photo-document the shoreline. A person designated by the Unified Command or Investigations Unit will collect the source oil sample, if present. All communications with the Unified Command will be coordinated through the NRDA Representative (Section 1.5). Key contacts for mobilizing field teams are identified in Section 5.0.

2.0 SAMPLING PROCEDURES

2.1 OVERVIEW

This section describes methods for collecting source oil or fuel (i.e., product), weathered product (i.e., tar balls), sheen, water, sediment, and tissue. The protocol described below is to be followed unless the NRDA Agency Lead(s) decide otherwise and provide an alternative. This section provides a general overview of sample collection procedures. Appendix 1 provides maps of proposed pre-shoreline oiling sampling locations and baseline or ambient monitoring locations. Appendix 2 provides photographs of sampling locations and brief site descriptions. Appendix 3 provides a checklist for field sampling teams to consider before, during, and after planned field activities. Appendix 4 provides a list of equipment and supplies

necessary for collecting and documenting samples. Appendix 5 is CDFW-OSPR's 'Template' Sampling and Analysis Plan (SAP) used during the ephemeral data collection phase of an NRDA.

This plan refers to sample "locations" and sample "sites". A sample "location" is the general vicinity where the sample is to be collected (e.g., Marina State Beach). A sample "site" is the point referenced in decimal degrees by WGS84 datum where the sample is collected (e.g., points on a transect on Marina State Beach).

At a minimum, the following information should be recorded in field notes by each field team: names of field team members, name of person collecting the sample, type of sample collected and time of sample collection, global positioning system (GPS) location of sampling site, photographic log, standard observations such as weather and presence of wildlife and beach users, and any unusual sample conditions. After collected, all samples should immediately be chilled in an ice cooler with frozen blue, crushed, or block ice. Chain-of-custody must be maintained for all samples collected (see Section 4.0 and Appendix 5).

One NRDA team member each day or each shift will be responsible for a quality assurance review of the data sheets to verify that they are completely and correctly documented.

2.2 SAMPLING FREQUENCY

2.2.1 Ephemeral Data Collection Following a Spill Event

A source sample and baseline (pre-oiling) shoreline samples should be collected as soon as possible after the release. To achieve these objectives, the NRDA team must have notification procedures in effect for the immediate mobilization of field teams (see Sections 1.4 and 5). In the event that pre-oiling shoreline samples cannot be collected in time then ambient monitoring samples, collected during prior incidents or per this plan, may be used to help understand baseline conditions.

The frequency of sampling following the incident in impacted areas (i.e., daily, weekly, monthly) will depend on the magnitude of the incident, the type of product released, and the affected resource or habitat (e.g., rocky intertidal, water column, mudflat, sandy beach). The NRDA Agency Lead(s) will evaluate conditions and determine a suitable frequency for subsequent sampling in areas impacted by the incident.

2.2.2 Ambient Monitoring

Samples may be collected on to document and understand the potential magnitude of ambient petroleum hydrocarbon concentrations at the sites identified herein (Section 1.3). During the development of this plan, water, sediment, and tissue (mussels) samples were collected by CDFW-OSPR in October 2019 from ten sites

within along the Monterey County coastline and within Elkhorn Slough. The frequency of future ambient monitoring will be at CDFW-OSPR's discretion.

2.3 SAMPLING PRIORITY

Under ideal conditions (i.e., favorable weather and plenty of resources), collection of source oil samples and environmental samples identified below should occur in parallel and have first priority. Circumstances, and the timing of the mobilization of field teams, may prevent the collection of samples in the priority indicated below. Therefore, it is critical that the NRDA Agency Lead(s) quickly evaluate circumstances and available resources to determine the appropriate priority of sample collection.

- **First Priorities:**

- I. Collection of source oil(s) from the point of release. CDFW-OSPR Oil Spill Prevention Specialists and RP representatives (with the approval of CDFW-OSPR) are the appropriate personnel to collect source oil samples.
- II. Collection of water, sediment, and tissue in areas that are not yet impacted but are likely to be impacted based on trajectory analyses and the professional judgment of the Unified Command Scientific Support Coordinator. See Section 1.2.2 and Appendix 1 for information and maps that detail sampling location priorities within various segments of the coastline.
- III. Collection of water, product (i.e., tar balls, floating fuel) or sheen samples in impacted areas, provided it is safe (i.e., respirators not required and other proper PPE is applied, and site access is coordinated with the Unified Command. Within the impacted areas, the first priority is to sample water in oiled areas (e.g., areas with high, medium, low oiling levels), including sampling at the leading margin where the oil has begun to break up. Sheen and product samples for petroleum hydrocarbon fingerprinting also should be collected on water, on structures, and on shorelines to document the extent of the release.

- **Second and Ongoing Priorities:** After first priority samples are collected in the initial days following the incident, additional sheen, product, water, sediment, and tissues samples may be collected for chemical analysis on a weekly, monthly, or annual basis as required for injury assessment purposes (Section 2.2.1).

2.4 SAMPLE DOCUMENTATION AND HANDLING PROCEDURES

2.4.1 Sample Labeling

All samples must be labeled for proper sample tracking, transport, chain-of-custody, and chemical analysis. Fill out a label for each jar, vial, bottle or foil/plastic bag with

the following information: name of the incident/case; sample ID number; date, time, and location of sample collection; sample type and amount; and collector's name. Use a pen or permanent marker for labeling and cover label with clear plastic tape if the label is not printed on waterproof paper. Appendix 5 includes sample label templates and provides more detailed sample labeling procedures, including unique codes used to identify each type of sample collected. For purposes of identifying the technical or resource NRDA field team involved with sampling, sampling codes should include "ED" for "Ephemeral Data Collection" and a one number code identifying the field team that collected the sample.

2.4.2 Contamination Precautions

A sample will be contaminated if the gloves you are wearing contacts oil. If a glove comes into contact with oil, do not sample, change gloves, and take another sample if necessary. Avoid sampling downwind of engine exhaust. Use certified pre-cleaned glassware. If glassware comes in contact with oil, discard and resample with a clean bottle. If oil is present, clean or cover boots between sampling locations as needed to avoid cross-contamination.

2.4.3 GPS

Record all sampling locations by location name and provide GPS coordinates (WGS84 datum in decimal degrees) in field notes for each sampling site.

2.4.4 Sample Storage

Store samples in a cooler with enough ice to chill and preserve the samples at approximately 4°C with ice. Sample holding times will vary, depending primarily on the matrix and type of sample collected (see Appendix 5), so if questions arise regarding holding times, contact the analytical laboratory (see Section 5.0). Transport as soon as practical (and within 12 hours) to the laboratory or a secure refrigerator where the samples can be stored at 4°C until a decision about subsequent analyses can be made. Use packing material to avoid breakage. Keep source oil sample(s) separate from other samples and from each other.

2.4.5 Decontamination

If samples are collected from multiple sources, clean non-disposable sampling equipment with Alconox followed by a distilled water rinse between each sample collection. Methanol may also be used to clean sampling equipment. Change gloves between sample collections. Collect rinse water in a container and dispose of appropriately following waste handling procedures described below. Further information on decontamination is provided in Appendix 5.

2.4.6 Waste Handling

When decontaminating sampling equipment, wash and rinse over a plastic bucket with a lid. Store all oily rags, paper towels, gloves, and other contaminated material in a plastic bag. Dispose of rinse water and contaminated material in accordance with the waste management plan prepared by the Unified Command Environmental Unit.

2.4.7 Recordkeeping

Record the date, time, and location of sample collection, sample collection GPS waypoint(s) and coordinates, and name(s) of collector(s). Take a photograph of the area where the samples were collected.

2.4.8 Photo Documentation

Photograph or video the sampling site. Take video and/or the photos in both directions along the shore as well as from the waterline toward the backshore, and from the backshore to the waterline. Try to get permanent and distinctive landmarks in some photos and/or videos for future reference. The date, time, and GPS location of the photographs/video should be documented. Photographs should be processed so that sample locations are GPS-referenced on a map. See Appendix 5 for more detailed information.

2.5 SOURCE OIL SAMPLING

It is critical that all sources of released oil be identified and sampled at the point of release. This is typically, and most appropriately, done as part of the response activities directed by the Unified Command or by state and federal incident investigators, not NRDA personnel. The NRDA Representative will coordinate with the U.C. and incident investigators to confirm that sampling of the released material (e.g., oil) from its source will be conducted. The NRDA Representative also will brief the incident investigators and Unified Command regarding NRDA sampling activities and any special NRDA concerns. Source sample collection at the point of release is overseen by the State incident investigator (i.e., warden) and collections are normally done by CDFW-OSPR Oil Spill Prevention Specialists. Source sampling by NRDA personnel is usually not recommended because of the hazards and expertise needed to sample fuel tanks, pipelines, or vessels following a release.

Sampling of released oil, dispersed in the environment, is recommended for documenting the spatial extent of impacts and confirming the source of the oil. Provided safety considerations are met (Section 1.2.3), NRDA field teams may collect these types of samples.

Samples will be analyzed for petroleum fingerprinting purposes (Section 3).

2.5.1 General Procedure for Collecting Source Oil from Point of Release

- **Timing:** First priority; collect as soon as possible.
- **Sample Location:** To be coordinated by CDFW-OSPR Oil Spill Prevention Specialists and the Unified Command Incident Site Safety Officer.
- **Sampling Equipment and Supplies:** Certified pre-cleaned, 1-liter wide-mouth glass jar with an airtight Teflon®-lined lid. Paper, metal, or plastic funnel may be used to transfer oil. Under emergency conditions, a new metal or plastic bucket (least preferred) may be used after cleaning with soap and water.
- **Sample Volume:** 1-liter, minimum.
- **Number of Samples:** Sample quantity may be scaled for petroleum fingerprinting and toxicity assessment depending on the size of the release. The volume to collect should be determined by the NRDA Agency Lead(s) and the EDCC.
- **Sampling Procedure:** Per CDFW-OSPR Oil Spill Prevention Specialists. Label, preserve, store, and ship samples as previously discussed (Section 2.4).

2.5.2 General Procedures for Collecting Sheen or Oil on Shorelines or on Water

Rainbow sheen on water or structures

In cases where the released material is visible as a rainbow sheen either floating on water or coating structures; samples may be collected for petroleum fingerprinting purposes to define the extent of the release.

- **Timing:** Second priority; collect as directed by the NRDA Agency Lead(s).
- **Sample Location:** The locations and numbers of samples to collect are spill-specific and should be coordinated through the NRDA Agency Lead(s) and the EDCC.
- **Sampling Equipment and Supplies:** Four 12" fiberglass sheets. Certified pre-cleaned, 250-mL wide-mouth glass jar with an airtight Teflon®-lined lid.
- **Number of Samples:** At least one sample (four fiberglass sheets) should be collected that represents each location visited.
- **Sampling Procedure:** Sheen samples are collected by passing fiberglass sheets through the sheen floating on water or coating substrate, at approximately a 90-degree angle. Place the fiberglass into the glass jar and cap. See Appendix

5 for more detailed information. Label, preserve, store, and ship samples as previously discussed (Section 2.4).

Oil on water, shoreline, or structures

In cases where the released material is highly viscous, concentrated, or weathered (e.g., fuel oil, crude oil), either floating on water, submerged, stranded on the beach, or coating structures; samples of product may be collected for petroleum fingerprinting purposes and to document the extent of the release.

- **Timing:** Second priority; collect as directed by the NRDA Agency Lead(s).
- **Sample Location:** The locations and numbers of samples to collect are spill-specific and should be coordinated through the NRDA Agency Lead(s) and the EDCC.
- **Sampling Equipment and Supplies:** Certified pre-cleaned, 250-mL wide-mouth glass jar with an airtight Teflon[®]-lined lid. Wooden tongue depressors.
- **Sample Volume:** At least one (25+ gram) sample should be collected that represents each location visited.
- **Number of Samples:** A 250-mL jar for each sample.
- **Sampling Procedure:** Product (i.e., tar balls) is collected by using a disposable wooden tongue depressor. Only 1 tar ball should be placed into each jar. DO NOT COMPOSITE. Use a clean wooden tongue depressor for each tar ball. Submerged product may need to be collected by oil adsorbing pom- poms or by other means. Label, preserve, store, and ship samples as previously discussed (Section 2.4).

2.6 WATER SAMPLING

Water samples will be collected for analyses of benzene, toluene, ethyl benzene, and xylenes (BTEX), total petroleum hydrocarbons (TPH), and polycyclic aromatic hydrocarbons (PAHs; see Section 3 for analytical methods).

2.6.1 General Procedures and Sampling Locations

- **Timing:** First priority: areas that are not yet impacted. Second priority: areas under the floating oil, near or offshore. Collect as directed by NRDA Agency Lead(s).
- **Sample Location:** After evaluating circumstances, and as health and safety conditions dictate, the NRDA Agency Lead(s) may discuss the need to select sampling locations in addition to or different from those identified in Section 1.3, including offshore locations only accessible by boat. However, for purposes of implementing this plan, the identified shoreline locations (Appendix 1) should be

sampled (see Section 9 for driving directions, and Appendix 2 for photographs of identified sampling areas): *See Section 1.3 for the list of pre-impact water sampling priority locations.*

Immediate Post-impact Priorities

- Along impacted shorelines, including beaches or rocky intertidal areas. Include sheen or surface floating oil sample for chemical fingerprinting.
- Water under floating oil slicks by boat. Include sheen or surface floating oil sample for chemical fingerprinting.

Alternate Sampling Areas

Depending on spill trajectory models, additional shoreline areas may require sampling.

- **Sampling Equipment and Supplies:** For offshore samples, a subsurface grab sampler (e.g., Ben Meadows Subsurface Grab Sampler) with certified pre-cleaned, 1-liter, wide-mouth amber glass bottles should be used. Onshore samples may be collected by hand with certified pre-cleaned, 1-liter, wide-mouth amber glass bottles. In beach environments with wave action, use the subsurface grab sampler with certified pre-cleaned 1-liter, wide-mouth amber glass bottles to reach into the water. See Appendix 5 for more detailed information.
- **Sample Volume:** 1-liter, to be used for analyses of TPH and/or PAHs. 40-mL vials to be used for VOAs. See allocation procedures per Sections 2.6.2, and 2.6.3, below.
- **Number of Samples:**
 - Offshore Field Teams – Collect one 1-liter sample from each identified offshore sampling location. At each location, collect the sample from just below the impacted surface area (~ 0.5 foot). Depending on the type of material released, other depth intervals may be targeted for sampling per the direction of the NRDA Agency Lead(s).
 - Onshore Field Teams – Collect one 1-liter sample from each identified pier structure or beach location identified above.
 - Quality Assurance/Quality Control (QA/QC) Samples – Collect as directed by the NRDA Agency Lead(s). See Section 2.9 and Appendix 5 for further details.
- **Sampling Procedure:** Visible oil on the water surface should be moved aside with a water hose, compressed air, or paddle. Care should be taken not to disperse oil into the water column. The subsurface sampler should be opened at

a depth of approximately 0.5 ft. below the surface (or at specified depths determined by the NRDA Agency Lead). Label, preserve, store, and ship samples as previously discussed (Section 2.4).

2.6.2 VOA Samples

Volatile organic analysis (VOA) water samples are collected in glass vials and analyzed for BTEX (Section 3).

- **Timing:** Same as Section 2.6.1.
- **Sample Location:** Sheen in water or beach sand.
- **Sampling Equipment and Supplies:** 40-mL screw-cap glass vials with Teflon®-faced silicone septum (hereafter referred to as 'VOA vials').
- **Sample Volume:** Three 40-mL vials.
- **Number of Samples:** Three per location or as directed by NRDA Agency Lead(s).
- **Sampling Procedure:** After collecting a 1-liter sample, gently pour water into a VOA vial to avoid bubble formation. Fill the vial until a meniscus forms over vial's lip. Alternatively, the VOA sample may be collected directly, by hand, in the same manner as the 1-liter sample. Cover with the screw-cap lid, tighten the lid and invert the vial and tap the end to check for air bubbles. If bubbles are present, pour out the sample and resample with a new VOA vial. Label, preserve, store, and ship samples as previously discussed (Section 2.4).

2.6.3 TPH and PAH Samples

Water samples collected and analyzed for TPH, PAH and alkylated PAH content (Section 3).

- **Timing:** Same as Section 2.6.1.
- **Sample Location:** Same as Section 2.6.1 and 2.6.2.
- **Sampling Equipment and Supplies:** Certified pre-cleaned 1-liter, wide-mouth amber glass bottles.
- **Sample Volume:** 1-liter
- **Number of Samples:** One each per location or as directed by NRDA Agency Lead(s).

- **Sampling Procedure:** Collect a 1-liter sample, and after decanting water for the VOA sample, cover with screw-cap lid and tighten. See Appendix 5 for additional details. Label, preserve, store, and ship samples as previously discussed (Section 2.4).

2.6.4 Porewater Samples

Water samples collected and analyzed for TPH, PAH and alkylated PAH content (Section 3).

- **Timing:** Same as Section 2.6.1.
- **Sample Location:** Same as Section 2.6.1 and 2.6.2.
- **Sampling Equipment and Supplies:** Certified pre-cleaned 1-liter, wide-mouth amber glass bottles, shovel.
- **Sample Volume:** As directed by NRDA Agency Lead(s).
- **Number of Samples:** As directed by NRDA Agency Lead(s).
- **Sampling Procedure:** Near the lower to mid-intertidal zones, dig a pit of roughly 2 ft. wide and 18 in. deep with a shovel. The pit should be deep enough to submerge a 1-liter amber glass bottle. Try not to select an area that will be overcome by the tide as only interstitial water should be collected. Allow the pit to fill up water before collecting. Submerge a 1-liter bottle into the pit and collect the water, including visible sheen until the bottle is full. Once full, cover with the screw-cap lid, and tighten. Label, preserve, store, and ship samples as previously discussed (Section 2.4).

2.7 SEDIMENT SAMPLING

2.7.1 General Procedures and Sampling Locations

- **Timing:** First priority: areas that are not yet impacted. Second priority: areas where oil has stranded onshore. Collect as directed by NRDA Agency Lead(s).
- **Sample Location:** After evaluating circumstances and as health and safety conditions dictate, the NRDA Agency Lead(s) may discuss the need to select sampling locations in addition to or different from those identified in Section 1.3. However, for purposes of implementing this plan, the identified shoreline locations should be sampled (see Appendix 1 for maps and Appendix 2 for photographs of identified sampling areas): *See Section 1.3 for the list of preimpact sediment sampling priority locations.*

- **Sampling Equipment and Supplies:** Pre-cleaned or disposable stainless steel or wooden spoon, certified pre-cleaned 250-mL screw-cap jar with Teflon®-lined lid, or certified pre-cleaned 1-liter wide-mouth amber glass bottles with Teflon®-lined lid. Plastic one-gallon re-sealable bags.

- **Sample Volume:** Fill the jars or bottles completely with sediment.

Composite samples – 1-liter bottle, to be used for analyses of TPH, and/or PAHs. The laboratory will split the sample for the appropriate analyses.

Non-composite (individual) samples – individual 250-mL jars, one for each analysis (i.e., TPH and PAH).

A plastic one-gallon re-sealable bag, approximately one-third of the way full of sediment that is representative of the composite or discrete sample collected for grain size and TOC analysis.

- **Number of Samples:** *Composite samples* - Three 1-liter composite samples per transect. *Non-composite (individual) samples* – one 250-mL jar per site. One-gallon sized re-sealable bag (one-third of the way full) per transect.
- **Sampling Procedure:** At each location, three transects equally spaced and perpendicular to the shore should be established. Judgment must be applied as to how far to space these transects, with consideration given to characterizing an area that may later become impacted with the released material.

Composite samples – If collecting composite samples, collect 1-liter samples from the low, mid, and high tide elevations. Each composite sample should include at least five subsamples collected within a 5-foot diameter from a point on the transect crossing each tidal elevation (see Figure 2). A separate re-sealable bag for grain size analysis does not need to be collected.

Non-composite (individual) samples - If collecting non-composite samples, fill a 250-mL jar with sediment from each sampling location. Along with individual samples, a separate re-sealable bag, for grain size and TOC analysis is required. Collect sediment along each transect and composite it into a gallon sized re-sealable bag, approximately one-third of the way full (Appendix 5).

For various petroleum releases, collect sediment at the following depths:

- Gasoline or diesel fuel releases: ~1-foot-deep sediment core (see Appendix 5 for sediment coring methods).
- Crude or heavy fuel oil spills: ~2 centimeters deep surface grab sample.

Label, preserve, store, and ship samples as previously discussed (Section 2.4).

2.8 TISSUE SAMPLES

Tissue samples should be collected to document the potential exposure to petroleum hydrocarbons. Species suitable for collection include mussels, clams, oysters, or crabs. Bivalves are generally preferable and collection details are provided below. Field teams without a CDFW representative during sampling events must have a valid scientific collection permit and must coordinate collection with CDFW. Preferably, samples can be collected by a CDFW employee to avoid the necessity of obtaining a scientific collection permit. If a CDFW employee is not present to collect the sample, then non-CDFW NRDA field team members may be provided written authorization to collect tissue samples during the initial phase of the ephemeral data collection period.

2.8.1 General Procedures and Sampling Locations

- **Timing:** First priority: areas that are not yet impacted. Second priority: areas where oil has stranded onshore. Collect as directed by NRDA Agency Lead(s).
- **Sample Location:** Rocky intertidal. *See Section 1.3 for the list of pre-impact tissue sampling priority locations.*
- **Sampling Equipment and Supplies:** Pre-cleaned or disposable stainless-steel trowel or shovel for exposing subsurface bivalves or stainless-steel trowel, large knife or similar tools for removing surface bivalves. Aluminum foil and plastic one-gallon re-sealable bags.
- **Sample Size:** Enough for at least a 10-20-gram composite of soft tissue.
- **Sampling Procedure:** Remove the animals from the rocky shore or surface of the sediment, and, if necessary, rinse the debris and sediment from them using (in order of preference) distilled water, clean tap water, or clean seawater. Exterior rinses of shelled organisms (i.e., bivalves) are not usually necessary since only the tissue is extracted and analyzed. However, loosely adhered debris and sediment may be removed before wrapping samples. Place rinsed animals in heavy-duty aluminum foil (dull side to the animals) and wrap them in several layers. Place foil-wrapped organisms in a plastic one-gallon re-sealable bag with adhered label. Place a second bag around the first bag to protect the label between the two bags. Label, preserve, store, and ship samples as previously discussed (Section 2.4).

2.8.2 General Procedures and Sampling Locations - Talitrids

- **Timing:** Same as Section 2.8.1.

- **Sampling Equipment and Supplies:** Sediment corers, mesh bags with 1.5mm aperture, foil and plastic one-gallon re-sealable bags.
- **Sample Size:** Enough for at least a 10-20 gram composite of soft tissue.
- **Sampling Procedure:** To collect the organisms from the wrack zone, move the beach wrack and collect organisms with gloved hands. Place organisms into an aluminum foil cone (dull side to the animals; one end of foil closed). Close the opened side of the foil and place into a plastic one-gallon resealable bag with adhered label. Place a second bag around the first bag to protect the label between the two bags. To collect organisms by subsurface cores, randomly core areas, to a depth of roughly 200 mm, that extend from the terrestrial vegetation or bluff to the intertidal swash zone. Pool cores into a mesh bag with a 1.5 mm aperture for sieving. Close the open part of the bag and sieve the mesh bag in the swash zone to remove the sediment. Transfer the animals left in the bag to an aluminum foil cone (dull side to the animals; one end of the foil closed). Close the opened side of the foil and place into a plastic one-gallon resealable bag with adhered label. Place a second bag around the first bag to protect the label between the two bags.

Label, preserve, store, and ship samples as previously discussed (Section 2.4).

2.8.3 General Procedures and Sampling Locations - Sand crabs

- **Timing:** Same as Section 2.8.1.
- **Sample Location:** Sandy beach.
- **Sampling Equipment and Supplies:** Shovels, mesh bags with 1.5mm aperture, aluminum foil and plastic one-gallon re-sealable bags.
- **Sample Size:** Enough for at least a 10-20 gram composite of soft tissue.
- **Sampling Procedure:** Using a shovel, collect the top 4 to 6 cm of sand and place into a mesh bag – randomly collect multiple shovelfuls into one bag. Close the open part of the bag and sieve the mesh bag in the swash zone to remove the sediment. Transfer the animals, using gloved hands, into an aluminum foil cone (dull side to animals; one end of foil closed). Repeat the above steps until the desired amount of sand crabs has been collected. Close the opened side of the foil and place into a plastic one-gallon resealable bag with adhered label. Place a second bag around the first bag to protect the label between the two bags. Label, preserve, store, and ship samples as previously discussed (Section 2.4).

2.9 QA/QC Samples

The types of samples collected for QA/QC purposes will be at the discretion of NRDA Agency Lead(s). More information can be found in the NRDA Sampling and Analysis Plan template (Appendix 5). The samples can be taken in VOA vial(s) for BTEX and 1-liter bottle(s) for TPH and PAH analyses, as directed by the NRDA Agency Lead(s) and EDCC.

- **Timing:** As required by NRDA Agency Leads(s).
- **Sample Location:** As determined by NRDA Agency Lead(s).
- **Sampling Equipment and Supplies:** Certified pre-cleaned, 1-liter, wide-mouth amber glass bottles with Teflon[®]-lined lid and 40-mL screw-cap glass vials with Teflon[®]-faced silicone septum. Uncontaminated, clean bottled water.
- **Sample Volume:** 40-mL and/or 1-liter depending on chemical analysis.
- **Number of Samples:** As determined by NRDA Agency Lead(s). Minimum: one VOA vial and/or one 1-liter bottle.
- **Sampling Procedure:** Fill the vial or bottle with uncontaminated clean bottled water and place into the ice chest with the samples. Field blanks, trip blanks, and field duplicate samples are collected as described in Appendix 5. Label, preserve, store, and ship samples as previously discussed (Section 2.4).

3.0 CHEMICAL ANALYSES

3.1 LABORATORIES

Send samples to either the CDFW-OSPR Pollution Chemistry Laboratory, or other designated laboratory based on the collective decision of the NRDA Agency Lead(s)

3.2 METHODS

The NRDA Agency Lead(s) and the EDCC shall coordinate which chemical analyses are suitable for the collected samples. The following analyses and methods may be requested:

- **Water Samples:** PAHs and alkylated PAHs (EPA Method 8270-modified-GC/MS/SIM), TPH (EPA Method 8015, GC/FID, extended range), BTEX (EPA Method 8260 modified GC/MS/SIM).

- **Sediment Samples:** PAHs and alkylated PAHs (EPA Method 8270-modified-GC/MS/SIM), TPH (EPA Method 8015 modified, GC/FID, extended range). Request results on a dry weight basis.
- **Tissue Samples:** PAHs and alkylated PAHs (EPA Method 8270-modified-GC/MS/SIM), percent lipid content, and percent moisture. Request results as dry weight.
- **Source Oil, Sheen and Product Samples:** Complete fingerprinting characterization, including PAHs, alkylated PAHs and petroleum biomarkers (EPA Method 8270-modified-GC/MS/SIM); total petroleum hydrocarbons (TPH or THE; EPA Method 8015-modified GC/FID).

Additional methods that may be requested include: BTEX (EPA Method 8260 modified GC/MS/SIM), SARA (saturates, aromatics, resins and asphaltenes), PIANO (paraffins, iso-paraffins, aromatics, naphthenics and olefins; may include BTEX), density, boiling curve (simulated distillation), metals and sulfur content.

Fingerprinting analysis may vary between laboratories. Contact the laboratory that will be analyzing these samples to determine which analysis to request.

4.0 CHAIN-OF-CUSTODY

Chain-of-custody must be maintained at all times. Chain-of-custody means that the sample or data are under the possession and control of the person identified on the chain-of-custody form for the period specified on the form. Possession and control mean in the possession of, within sight of, or in secure storage with access limited only to the person in possession. The person relinquishing the samples and the person taking control of the samples need to sign the chain-of-custody form.

Before shipping samples, make sure that each chain-of-custody form is filled out completely and properly. Check that the sample identifications on sample bottles match the sample identifications on the chain-of-custody. Verify that the date, time, type, matrix and container types, and analyses requested are clearly indicated.

After the chain-of custody has been checked and verified, sign where indicated in the “Relinquished By” box at the bottom of the form. Make sure that the date and time that you relinquished the samples are recorded on the chain-of-custody. Put the chain-of-custody forms in a re-sealable bag and tape the bag to the lid inside the ice chest. Remember to put ice in the ice chest and tape the lid shut with duct tape. Take the ice chest to an over-night mail service and ship the samples to the lab as directed by the EDCC. Shipped material must comply with all applicable hazardous shipping regulations. When the lab receives the ice chest, the person accepting the samples will sign his or her name in the “Received By” box on the bottom of the

chain-of-custody form. The EDCC should receive a copy of each completed chain-of-custody form. See Appendix 5 for further information.

5.0 KEY NATURAL RESOURCE TRUSTEE REPRESENTATIVES AND CHEMICAL ANALYSIS/TECHNICAL SUPPORT CONTACT INFORMATION

For more information on the Contact Information, please contact CDFW-OSPR's NRDA Unit.

5.1 CA DEPARTMENT OF FISH AND WILDLIFE – OFFICE OF SPILL PREVENTION AND RESPONSE AGENCY LEAD(S)

5.2 U.S. FISH AND WILDLIFE SERVICE AGENCY LEAD(S)

5.3 NOAA AGENCY LEAD(S)

5.4 NOAA SANCTUARIES – MONTEREY BAY NATIONAL MARINE SANCTUARY

5.5 CA DEPARTMENT OF PARKS AND RECREATION

6.0 TECHNICAL SUPPORT AND CHEMICAL ANALYSIS CONTACT INFORMATION

6.1 U.S. DEPARTMENT OF THE INTERIOR (BUREAU OF LAND MANAGEMENT)

Central California District Office – Central Coast Field Office

6.2 CA DEPARTMENT OF FISH AND WILDLIFE – OFFICE OF SPILL PREVENTION AND RESPONSE CHEMICAL ANALYSES/TECHNICAL SUPPORT

Department of Fish and Wildlife Petroleum Chemistry Laboratory

7.0 OTHER STATE AND LOCAL AGENCY CONTACTS

7.1 CA COASTAL COMMISSION

7.2 CA STATE LANDS COMMISSION

7.3 CA DEPARTMENT OF FISH AND WILDLIFE – REGIONAL OFFICES

Marine Region (All CA coastline)

Statewide MPA Management Project

7.4 CA REGIONAL WATER QUALITY CONTROL BOARD

Central Coast (Region 3)

7.5 OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT

7.6 TRIBAL CONTACTS

Costanoan Rumsen Carmel Tribe

Ohlone Costanoan Esselen Nation

8.0 FEDEX SHIP CENTER ADDRESSES

FedEx Ship Center

1 Lower Ragsdale Dr.

Monterey, CA 93940

Hours of Operation: M-F 9:00-18:30

FedEx Ship Center

2660 Research Park Dr.

Soquel, CA 95073

Hours of Operation: M-F 9:00-18:30

FedEx Ship Center

710 Dado St.

San Jose, CA 95131

Hours of Operation: M-F 8:30-19:00

9.0 DIRECTIONS TO SAMPLING LOCATIONS

(FROM the CDFW Monterey Office – Northwest to Southwest)

- Kirby Park

Take CA-68 W and merge onto CA-1 N to CA-156 E towards Castroville. Turn left onto Castroville Blvd. Turn right onto Dolan Rd./Castroville Rd, then left onto Elkhorn Rd. Drive ~4.4 mile to Kirby Park, turn left into the park. Refer to Appendix 2, photographs 1-2.

- Hummingbird Island
Take CA-68 W and merge onto CA-1 N to CA-156 E towards Castroville. Turn left onto Castroville Blvd. Turn right onto Dolan Rd./Castroville Rd, then left onto Elkhorn Rd. Drive ~2 miles to the Elkhorn Slough Visitor Center. Take the dirt trail to the island. Refer to Appendix 2, photographs 3-4.
- Moss Landing Wildlife Area
Take CA-68 W and merge onto CA-1 N towards Santa Cruz. Continue on CA-1 towards Watsonville/Santa Cruz. Turn right onto the dirt road for the Wildlife Area, which is across from the Moss Landing North Harbor parking and shops. Follow the dirt road past the barn to the parking lot. Take the dirt trail east to the sampling location. Refer to Appendix 2, photographs 5-6.
- Moss Landing Harbor
Take CA-68 W and merge onto CA-1 N towards Santa Cruz. Continue on CA-1 towards Watsonville/Santa Cruz. Turn left onto Moss Landing Drive, then right onto Sandholdt Rd. Follow Sandholdt Rd until it ends. Refer to Appendix 2, photographs 7-8.
- Salinas River Mouth
Take CA-68 W and merge onto CA-1 N towards Santa Cruz. Take Exit #412 for Del Monte Blvd. Continue straight onto Monte Rd for ~ 1 mile. Once crossed over the river, park in the dirt lot on the left. Refer to Appendix 2, photograph 9-10.
- Marina State Beach
Take CA-68 W and merge onto CA-1 N towards Santa Cruz. Take Exit #410 for Reservation Rd. Turn left onto Reservation Rd and follow until it ends at the parking lot. Refer to Appendix 2, photographs 11-12.
- Monterey Bay's Fisherman's Wharf
Take CA-68 W and merge onto CA-1 S. Take Exit #401A towards Monterey. Turn right onto Camino Aguajito and left onto Del Monte Ave. Turn right onto Figueroa/Municipal Wharf 2. Refer to Appendix 2, photographs 13-14.
- Lover's Point
Take CA-68 W and merge onto CA-1 S. Take Exit #401A towards Monterey. Turn right onto Camino Aguajito and left onto Del Monte Ave, which becomes Lighthouse Ave. Continue onto Central Ave. Turn right onto 13th St. and left onto Ocean View Blvd. Turn right to stay on Ocean View Blvd. until reaching Lover's Point Park. Refer to Appendix 2, photographs 15-16.
- Asilomar State Beach
Take CA-68 W and merge onto CA-1 S. Take Exit #399A for CA-68 W towards Asilomar/Pacific Grove/Pebble Beach. Turn left onto Sunset Dr. and follow until reaching the beach. Refer to Appendix 2, photographs 17-18.

- Carmel River State Beach
Take CA-68 W and merge onto CA-1 S. Turn right onto Atherton Dr., and right onto Rio Rd. Turn left onto Santa Lucia Ave and left onto Carmel St. Follow until it ends at the parking lot. Refer to Appendix 2, photographs 19-20.

10.0 REFERENCES

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NOAA. 2019. Monterey Bay National Marine Sanctuary.
<https://montereybay.noaa.gov/intro/welcome.html>.

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FIGURES

Figure 1 Spill Response Unified Command Structure*

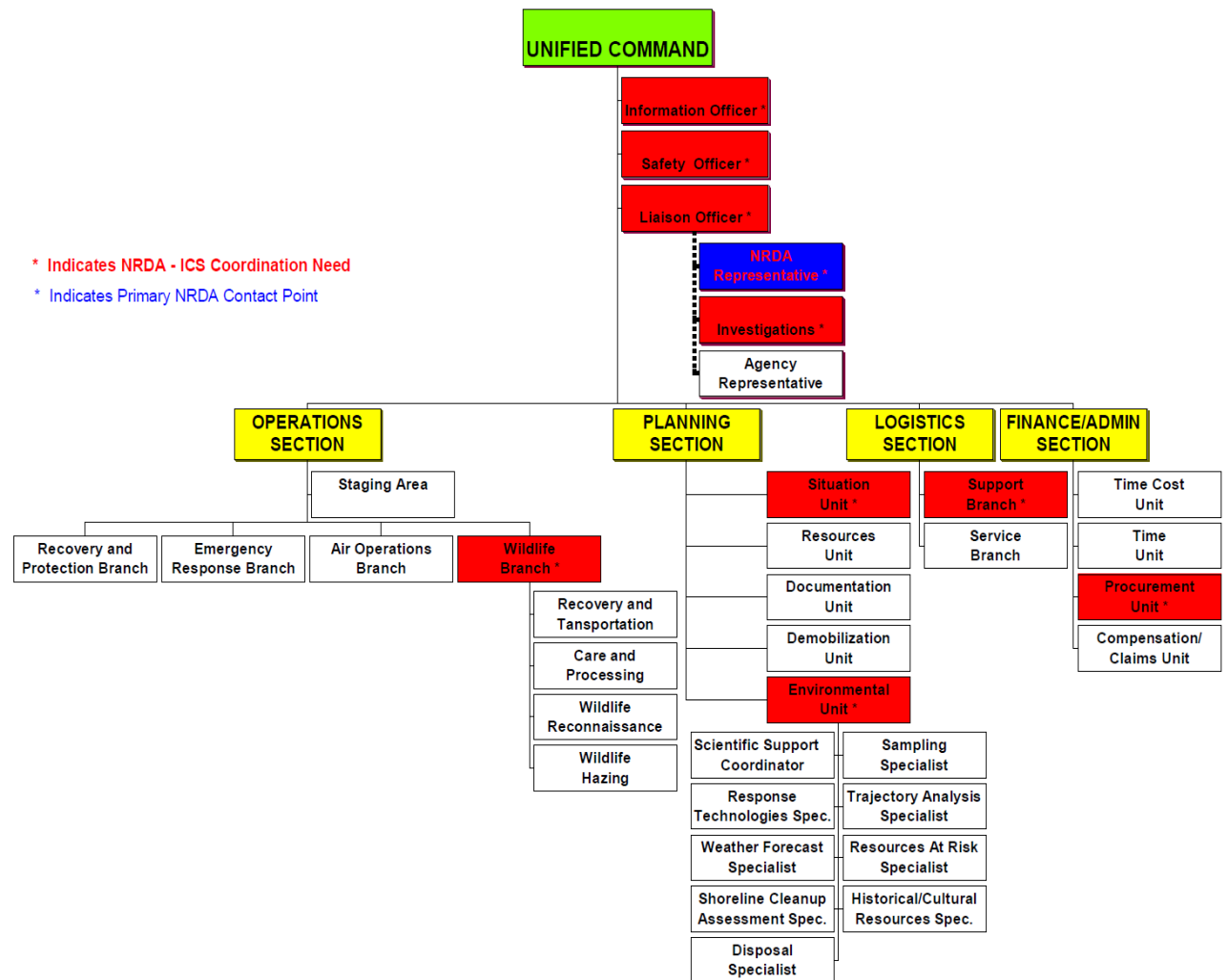
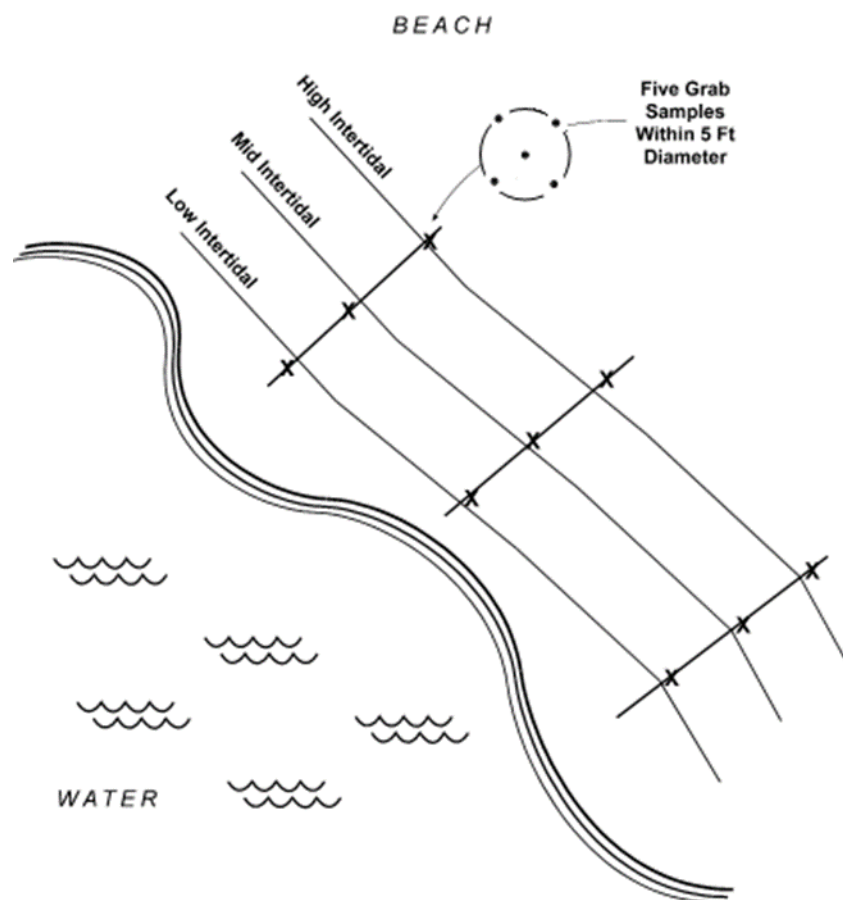


Figure 1. Spill Response Incident Command Structure Organization, Including Communication and Coordination Points with NRDA

* Includes communication and coordination points with NRDA

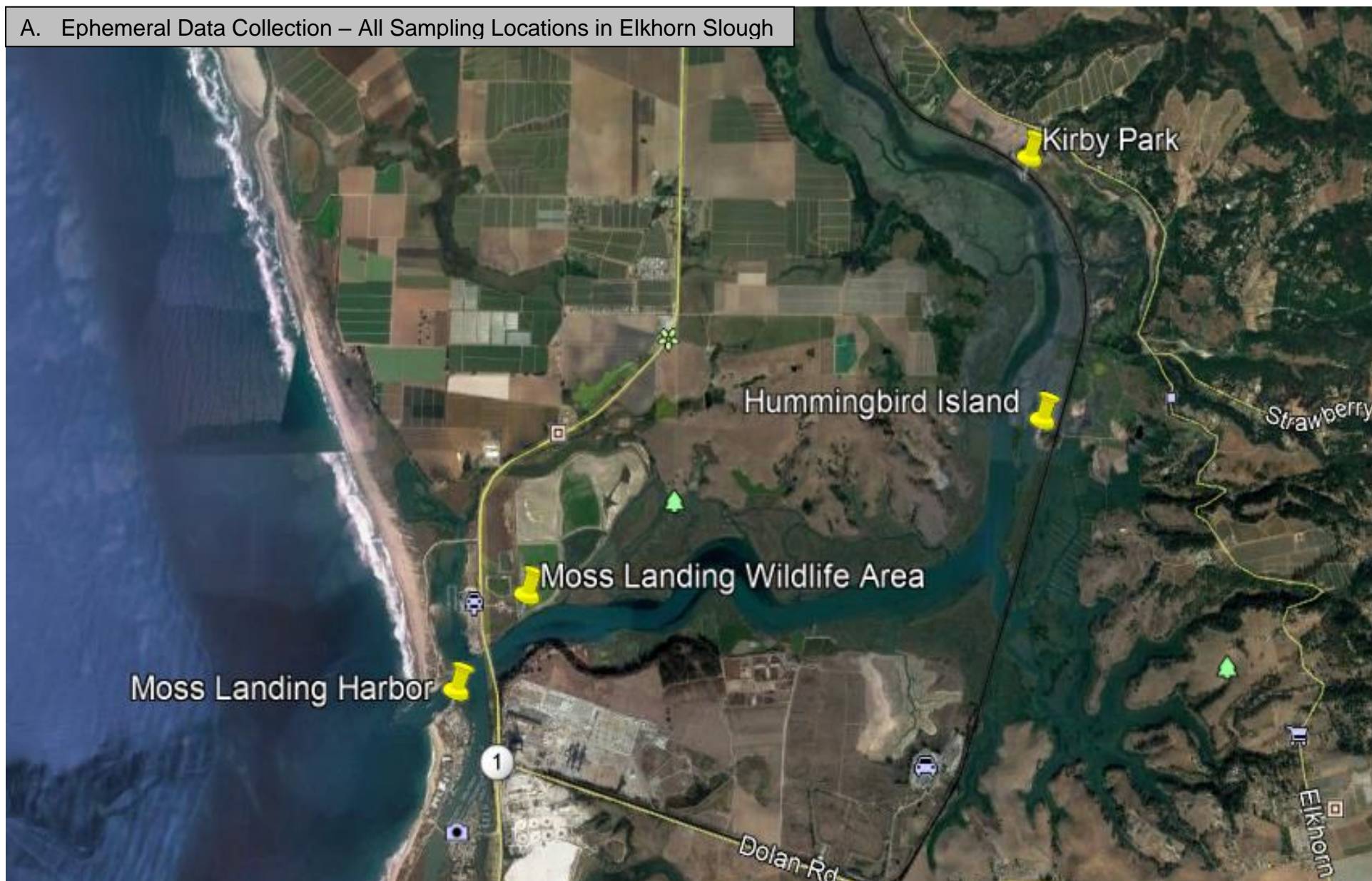
Figure 2 Example of Sediment Collection¹



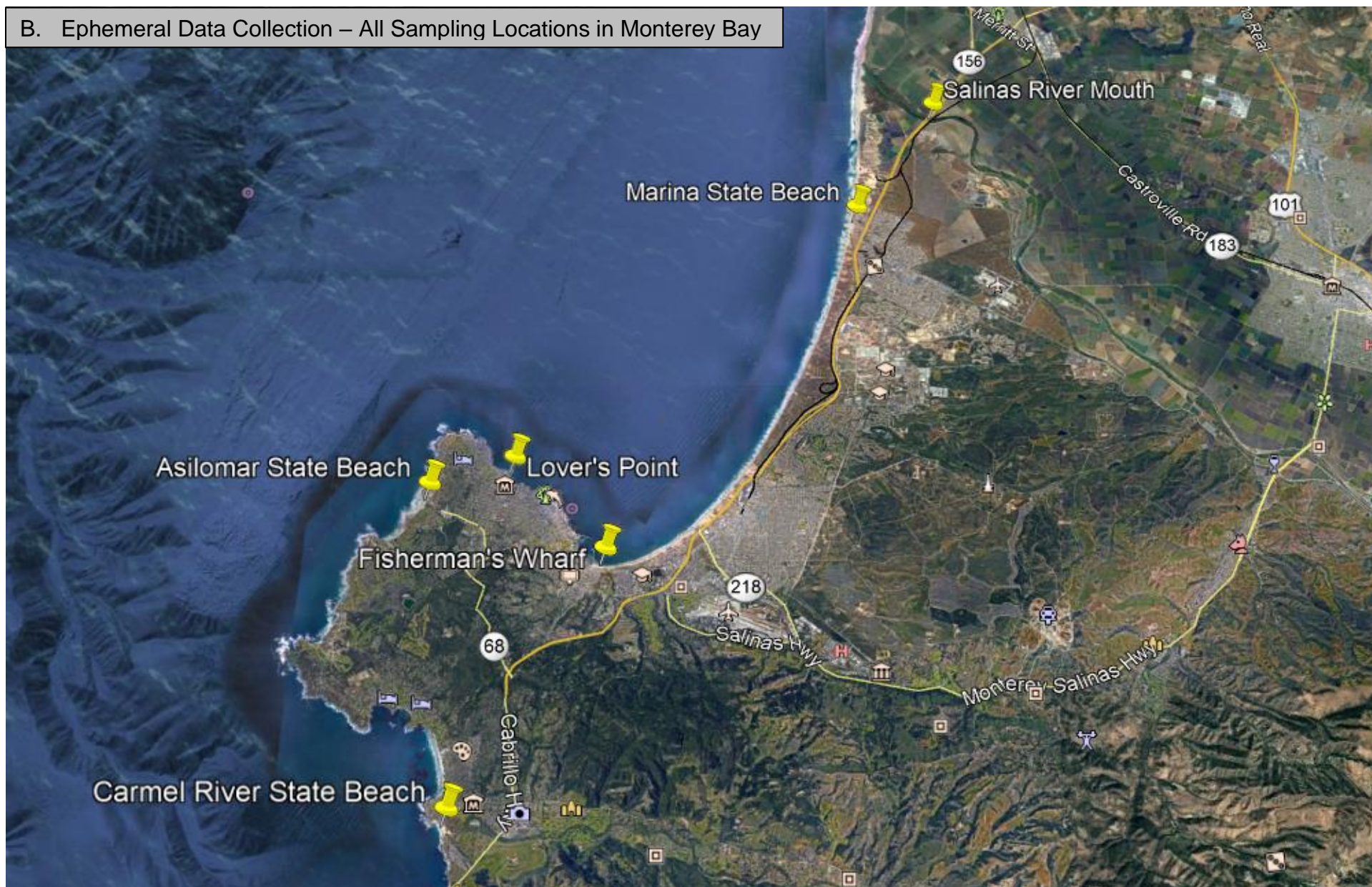
¹Judgment must be applied as to how far to space these transects, with consideration given to characterizing an area that may later become contaminated with the spilled material. For example, on small beaches such as Del Norte, transects may be closer together, such as 10 feet apart. At larger beaches, such as Stinky Beach, they may be farther, perhaps up to 50 feet apart.

**APPENDIX 1 MAPS OF SAMPLING LOCATIONS
MONTEREY COUNTY COASTLINE AND ELKHORN
SLOUGH**

A. Ephemeral Data Collection – All Sampling Locations in Elkhorn Slough



B. Ephemeral Data Collection – All Sampling Locations in Monterey Bay



C. Ephemeral Data Collection – Kirby Park



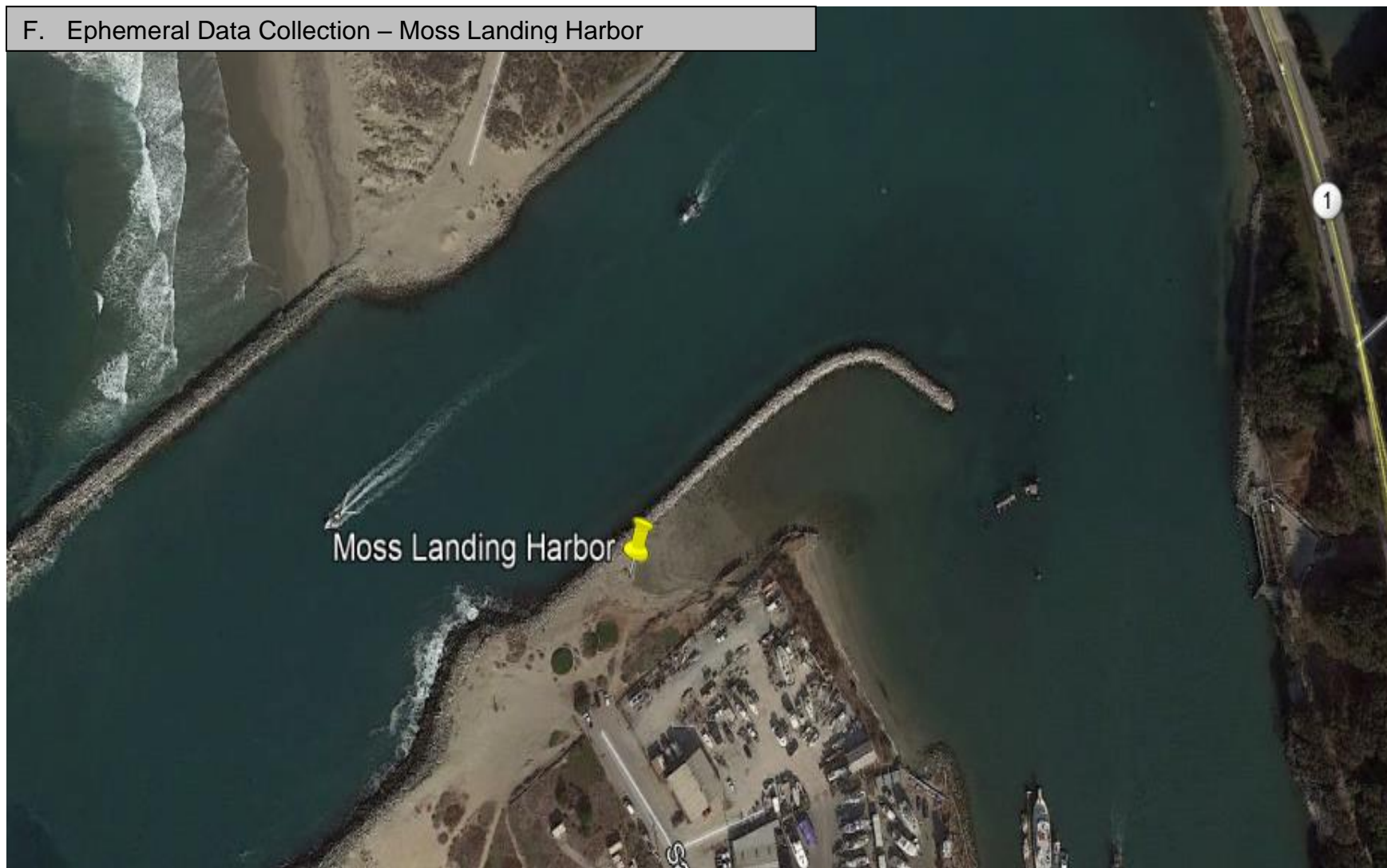
D. Ephemeral Data Collection – Hummingbird Island



E. Ephemeral Data Collection – Moss Landing Wildlife Area



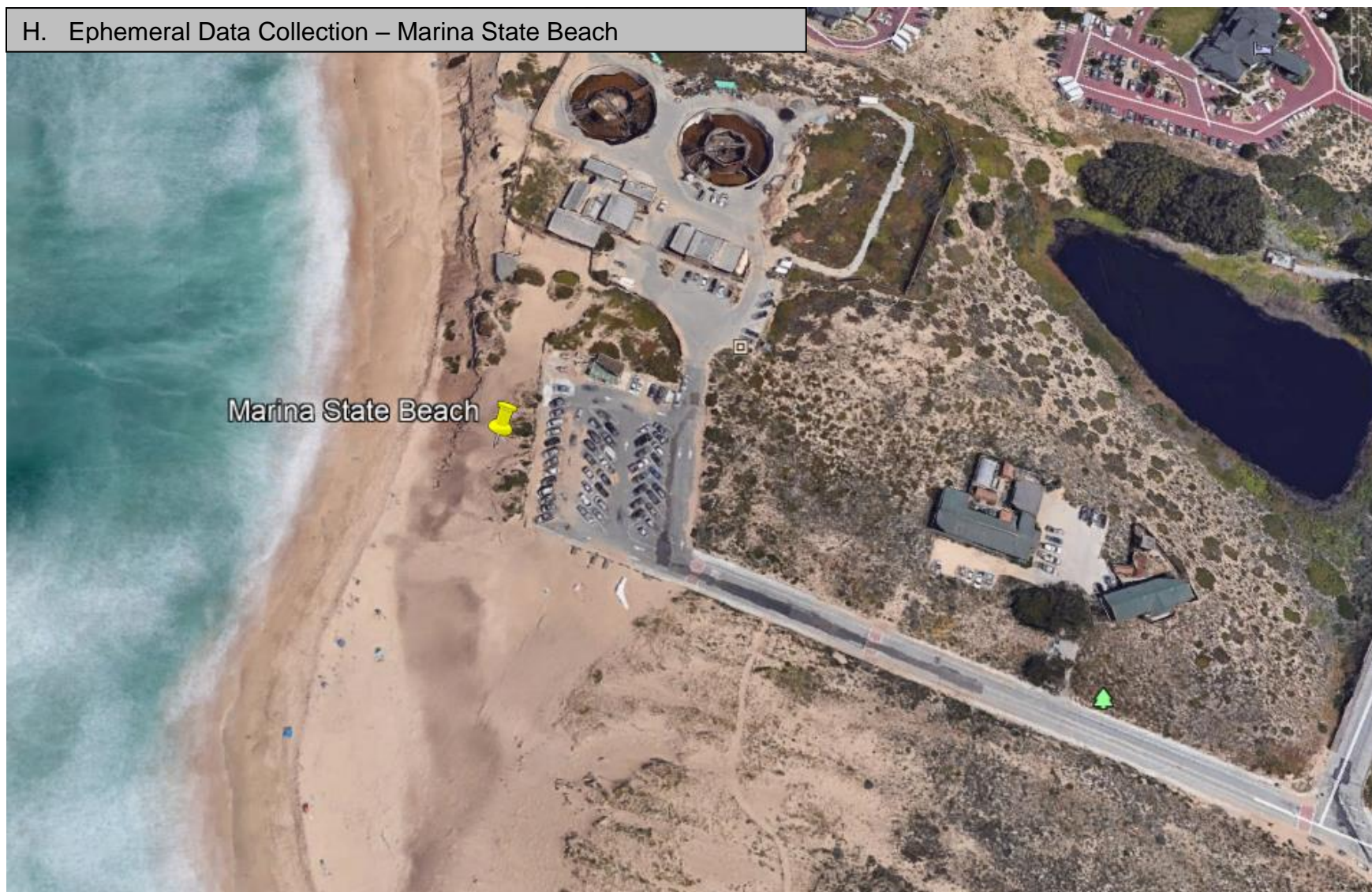
F. Ephemeral Data Collection – Moss Landing Harbor



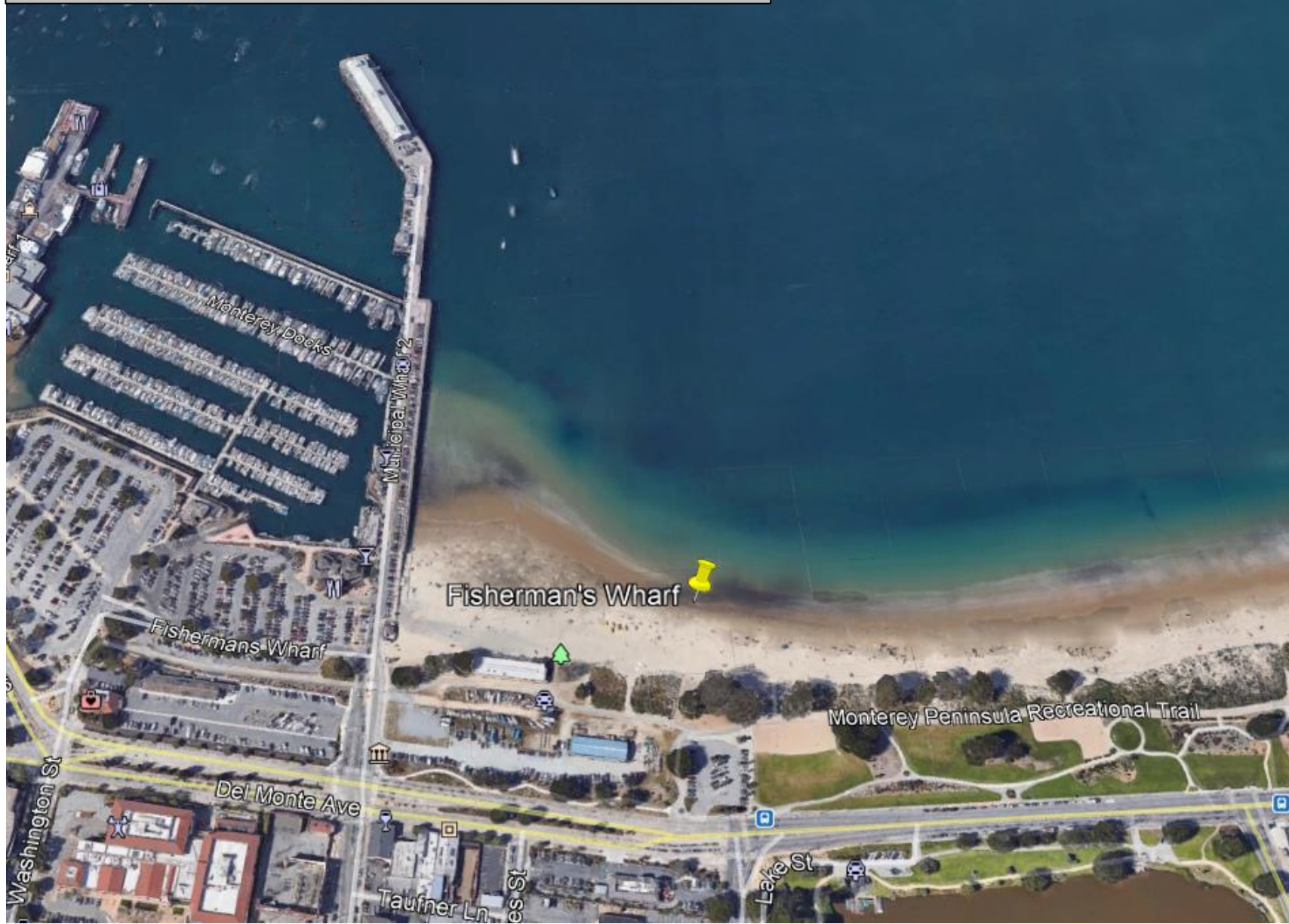
G. Ephemeral Data Collection – Salinas River Mouth



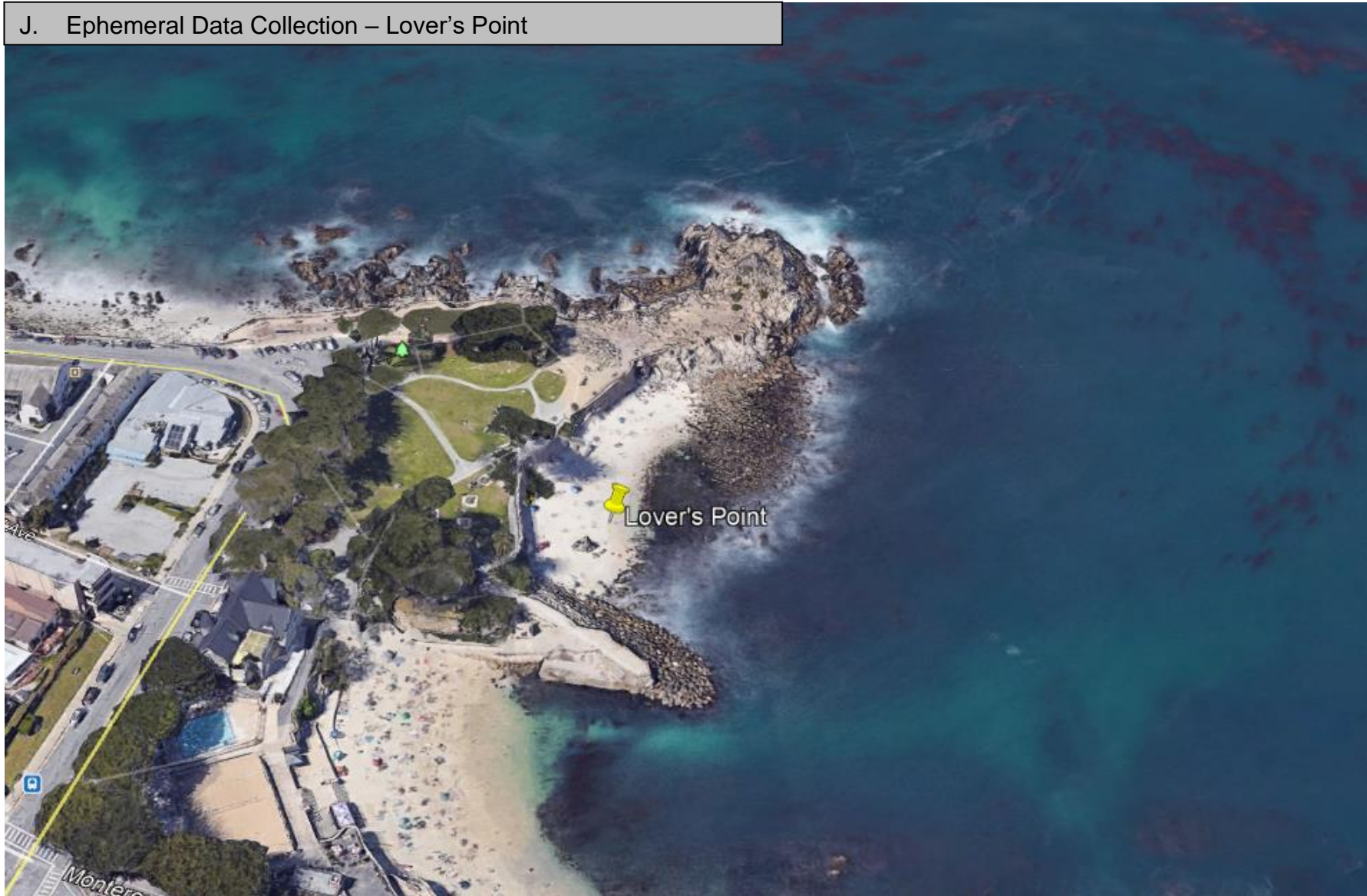
H. Ephemeral Data Collection – Marina State Beach



I. Ephemeral Data Collection – Monterey Bay's Fisherman's Wharf



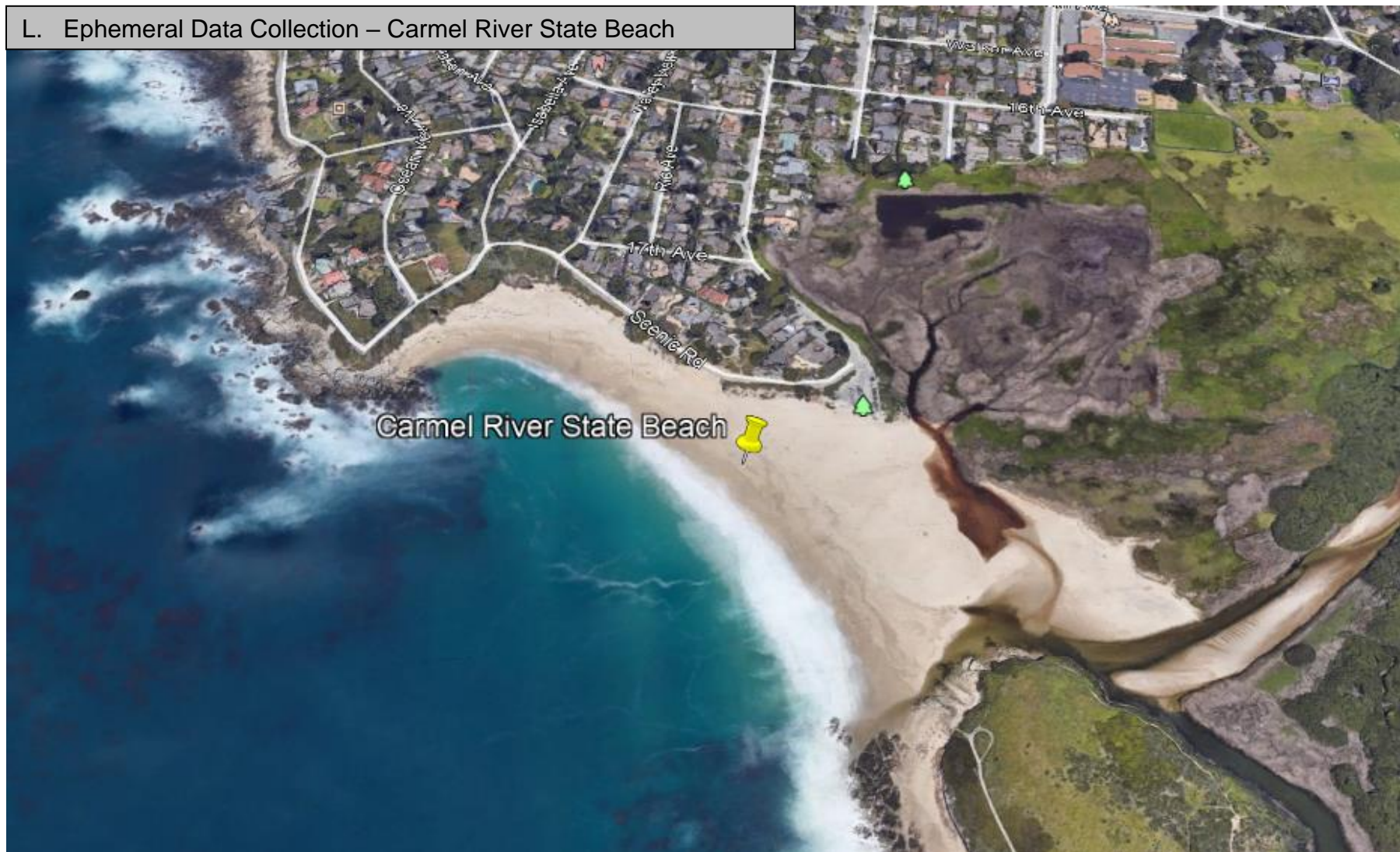
J. Ephemeral Data Collection – Lover's Point



K. Ephemeral Data Collection – Asilomar State Beach



L. Ephemeral Data Collection – Carmel River State Beach



APPENDIX 2 PHOTOGRAPHS OF HIGH PRIORITY EPHEMERAL AND AMBIENT DATA COLLECTION SAMPLING LOCATIONS



Photograph 1

Overview of Kirby Park parking lot and sample location.



Photograph 2

Parking, fishing pier and sediment sampling location at Kirby Park.



Photograph 3

Overview of Hummingbird Island sampling location. Parking and trail access from Elkhorn Slough Visitor Center.



Photograph 4
Hummingbird Island sampling location, looking east.



Photograph 5
Overview of Moss Landing Wildlife Area sampling location. Parking and trail access from parking lot off Highway 1.



Photograph 6
Moss Landing Wildlife Area sampling location looking west towards Highway 1.



Photograph 7

Overview of Moss Landing Harbor. Parking is along the street.



Photograph 8

Moss Landing Harbor sampling area.

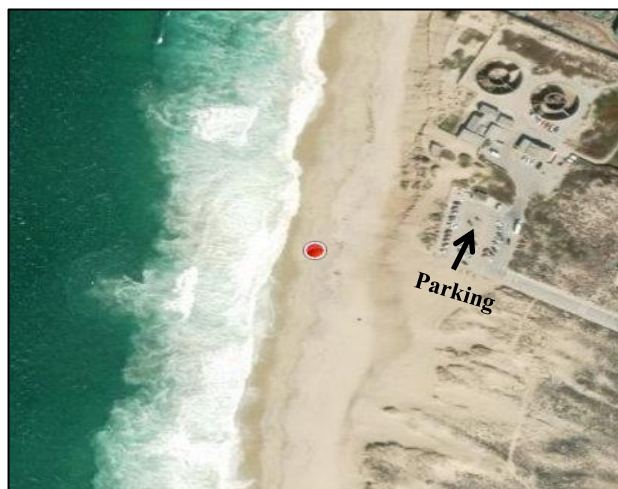


Photograph 9

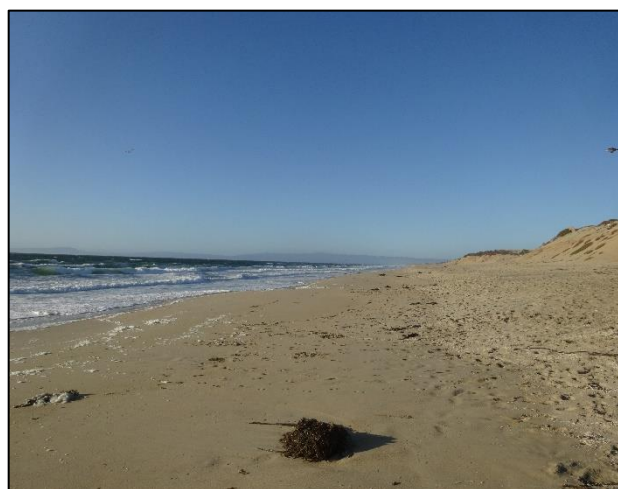
Overview of Salinas River Mouth parking lot and sampling location. Park in the dirt pullouts along the street.



Photograph 10
Salinas River mouth sampling location.



Photograph 11
Overview of Marina State Beach parking lot and sampling location.



Photograph 12
Marina State Beach sampling location. A wave spotter is advised.



Photograph 13

Overview of the Monterey Bay's Fisherman's Wharf sampling location. Mussels may be collected from the concrete wall near the red dot. Parking may be found in the small lot at 588 Del Monte Blvd. or at the Wharf's parking lot. Both parking lots charge hourly fees.



Photograph 14

Monterey Bay's Fisherman's Wharf sampling location looking west.



Photograph 15

Overview of Lover's Point parking and sampling location. Parking may be found in the small lot or along the street.



Photograph 16

Lover's Point sampling location looking west.



Photograph 17

Overview of Asilomar State Beach sampling location. Parking is found along the shoulder of the road.



Photograph 18

Asilomar State Beach sampling location looking north.



Photograph 19

Overview of Carmel River State Beach parking lot and sample location.



Photograph 20

Carmel River State Beach facing north. Mussels can be found along the rocks on the north end of the beach.

APPENDIX 3 CDFW-OSPR CHECKLIST FOR FIELD SAMPLING

NRDA FIELD CHECKLIST

Incident/Case: _____ Field Team Name and #: _____

Date (MMDDYY): _____

BEFORE FIELD

| EQUIPMENT & SUPPLIES | |
|--|--|
| Forms/COCs: See Table 1 for types and # of forms; clipboard (1 per team); sharpies, rite in the rain pen | |
| GPS & camera: 1 each per team; batteries (6 AA plus backup; check charge); photo scale | |
| Sampling equipment: See Table 3 for containers; freezer and trash bags; tongue depressors; spoons; may need sediment corer or pole water sampler | |
| Ice & coolers: 1+ large cooler for samples; get bagged ice prior to first sampling (3-4, 7-lb bags per cooler) | |
| Create trip blank for VOA: Obtain DI water (from store), fill and label 2, 40 mL VOA vials (see Table 3), and store in sample cooler; record on COC | |
| Clothing: Wear clothes/hat with NRDA and/or agency logos | |
| PPE & monitors: outer & inner gloves; chemical resistant boots/covers; safety glasses; PFD; H ₂ S monitor; GPS Spot Tracker | |
| FIELD TEAM ASSIGNMENT | |
| Contacts & Training: Give phone numbers and HAZWOPER training info for all team members to NRDA Field Ops; confirm if 1+ person has 40-hr HAZWOPER | |
| Daily Field Team Form: Complete Field Team Assignment and Objectives section; attach to ICS 213 General Message Form for Field Team Assignments and give to NRDA Representative | |
| SAMPLE PLANNING | |
| NRDA IDs: see Table 2 ; assign field team names and #s | |
| Access/Sites: Determine access points and directions; bring map/aerial image of the site; identify any site restrictions, access issues, sensitive species, and contacts | |
| Consider sub-surface sampling, depending on type of oil and substrate | |
| Contact lab: Make initial contact with selected analytical lab(s); arrange sample storage and transport | |

IN THE FIELD

| HEALTH & SAFETY | |
|--|--|
| GPS SPOT tracker: Turn on, press and hold the footprint (track progress button) until it flashes green | |
| Call NRDA Field Lead/Ops: at start and end of field activities, and if any health and safety incidents occur | |
| Health & Safety Plan: All team members review and sign. Complete a "tailgate" Health & Safety Meeting at initial site setup; as necessary, assign tasks appropriate for level of HAZWOPER training | |
| PPE: Sampler must wear eye protection and 2 pairs nitrile gloves - for water sampling by hand, wear smaller glove inside elbow-length; otherwise wear 2 pairs of smaller gloves (change outer pair between samples); secondary sample handler wear 1 pair of smaller gloves (change between sites) | |
| CAMERA/GPS | |
| Camera setup: Record make, model, ID# and time zone on the Photo Log ; clear previous photos; use continuous sequential numbering and daily folder; use max resolution; check battery charge; set camera time to match GPS time; take legible photo of current time on GPS and record on Photo Log ; do NOT delete photos | |
| GPS setup: Record make, model, ID# and time zone on the Photo Log ; clear previous track/waypoints; turn on track log; set track log to 15 sec time interval & wrap when full; set WGS84 in decimal degrees; enable WAAS; check battery charge; take waypoint at setup and record on Sample Collection Summary Form ; do NOT turn off | |
| PHOTO LOG and SAMPLING | |
| Sites: Take a waypoint at each site (with unique GPS lat/long) where sampling, observations, or other activities occur; record location and descriptions with sketch and observations on the Sample Collection Summary Form | |

NRDA FIELD CHECKLIST

Incident/Case: _____ Field Team Name and #: _____

Date (MMDDYY): _____

| | |
|--|--|
| Photo: Take photos of sampling location (up-coast, offshore, down-coast, close up) and collected samples (incl. sample label and scale); record waypoint, camera photo #, description/keywords and sample ID on the Photo Log | |
| Sample containers and amount: See Table 3 for sample types, containers, and amounts | |
| Sample ID: FieldTeamName FieldTeam # Date SampleType Sample # (e.g., <i>RI1 022611 MU01</i>) See Table 2 ; use a unique sample ID for every sample; number samples in sequential order beginning with 01 | |
| Sample labels: Fill out sample labels completely; include sample type and amount; Place label on glass jars or between 2 resealable bags (VOA & tissue samples) Sample Summary Collection Form: Fill out completely with field specific information including location name, waypoint, camera photo #, sample type, sampling method, sample ID, etc. Photo Log: include waypoint, camera photo #, description/keywords, and sample ID | |
| Sample storage: wrap jars in bubble wrap or foam sleeves; store on bagged ice between sampling locations | |

AFTER FIELD / AT COMMAND POST

| HEALTH & SAFETY | |
|--|--|
| Notify NRDA Field Lead/Ops and turn off spot tracker when leaving last field site | |
| Waste & Decon: check with NRDA Field Ops; dispose of used gloves and sampling wastes properly | |
| SAMPLES | |
| Storage: keep at 4°C in dark (in cooler on wet ice or in the fridge); maintain secure custody | |
| COC: fill out form; see Error! Reference source not found. for analysis types; clearly identify instructions to lab (e.g., hold, extract and hold, OR analyze); at sample transfer, both parties sign COC, original COC with samples, and copy to sampler | |
| Transport: Confirm transportation to and receipt by the analytical lab; use bagged ice and close drain for shipping; if shipping, follow air/ground shipping regulations | |
| EQUIPMENT/SUPPLIES | |
| Make sure all equipment is cleaned, stored; replace supplies and forms; recharge/replace batteries | |
| DATA INTAKE | |
| Coordinate location/time of data download with NRDA Field Lead/Ops | |
| Field Team: make sure all forms are complete; review and initial all forms | |
| File management: Scan/download forms/notes, GPS, and photos, save original and working copies in 2 locations; complete Data Intake section; organize files as shown below: <ul style="list-style-type: none"> - Daily folder (by field team and day): FieldTeamNameFieldTeam#_Date (e.g. <i>RI1_022611</i>) - Sub-folders by file type (GPS, photos, field forms) and status (original, working): FieldTeamNameFieldTeam#_Date_FileType.Status (e.g., <i>RI1_022611_Photo.Original</i>) | |
| GPS: save as .gpx, .gdb, and .txt files using Garmin MapSource™; clear waypoints and track from GPS | |
| Photos: Copy photos directly from memory card to “original” folder; copy to a “working” folder; do NOT change file names; clear photos from camera | |
| DATA MANAGEMENT | |
| Geotag: Match GPS and photos using GeoJot+ Core™; save output as .kml, tagged photos, & PDF | |
| Upload data: post GeoJot+ Core™ output (.kml & PDF) and scanned forms to CDFW Document Library | |
| Database: add sample info to Sample Tracking Sheet | |
| complete Data Management section of DFTF | |

NRDA FIELD CHECKLIST

Incident/Case: _____ Field Team Name and #: _____

Date (MMDDYY): _____

Table 1. FORMS

| Form Name (Abbrev) | Use | # |
|--------------------------------|--|--------------------|
| Daily Field Team Form (DFTF) | Info on field team members, logistics, assignments and objectives; daily summary; data intake and management | 1 - 2 per team |
| Sample Collection Summary Form | Record site and sample information | 1 - 6 sites /sheet |
| Photo Log | Record photo descriptions and corresponding samples | > 1 site /sheet |
| Sample labels | Identify sample ID, date, location and collector | 10 samples /sheet |
| Chain of custody (COC) | Record of sample custody; original stays with samples | 10 samples /sheet |

Table 2. SAMPLE ID: ⁽¹⁾FieldTeamName ⁽²⁾FieldTeam # ⁽³⁾Date ⁽⁴⁾SampleType ⁽⁵⁾Sample #

| ⁽¹⁾ Field Team Name (2 letters) | | ⁽²⁾ Field Team # (1 number; by field team and day) | | | |
|---|----|--|----|--------------------------|----|
| Agricultural Land | AG | ⁽³⁾ Date (date collected; MMDDYY) | | | |
| Aquatic Vegetation | AV | | | | |
| Barren Land | BL | | | | |
| Birds | BD | ⁽⁴⁾ Sample Type (2 letters) | | | |
| Desert Land | DL | Amphibian | AM | Other Tissue | OT |
| Dry Creek | DC | Aquatic Invertebrate | AI | Pore Water | PW |
| Ephemeral Data | ED | Aquatic Vegetation | AV | Reptile | RE |
| Fish | FI | Beach Wrack | WR | Riparian Vegetation | RV |
| Forest | FT | Clam | CL | Sediment | SD |
| Marine Mammals | MM | Crab | CR | Sheen | SH |
| Riparian Vegetation | RV | Dead Wildlife | DW | Surf Water | SW |
| Rocky Intertidal/Rip-rap | RI | Emerita/Sand Crab | EM | Terrestrial Invertebrate | TI |
| Salt Marsh/Mudflats/Lagoon | SM | Fish | FI | Terrestrial Mammal | TM |
| Sandy Beach | SB | Insect | IN | VOA | VO |
| Subtidal | ST | Mussel | MU | Water | WT |
| Terrestrial Mammals | TM | Oil/Tarball | TB | Other: | |
| Water Column | WC | ⁽⁵⁾ Sample # (2 numbers; sequential numbering beginning with 01; resets for each field team and day) | | | |
| Other | OT | | | | |

Table 3. ANALYTICAL CHEMISTRY SAMPLE INFORMATION (by sample type and analysis)

| Sample Type | Type & Size of Container | Amount | Analysis | Holding condition & time (days) | Ok to freeze? |
|--------------------|---|--------------------------|--|--|---------------|
| Water (WT) | 1 L wide-mouthed amber glass bottle | Full; 1+ ¹ | PAH ¹ | 4°C, dark: 7 to extract | No |
| VOA (VO) | 40 mL VOA vial | Full; 3 (1 backup) | BTEX | 4°C, dark: 7 to extract | No |
| Sheen (SH) | 12" fiberglass sheets; 250 mL glass jar | 4 sheets | Petroleum Fingerprint | Long-term | Yes |
| Tarball / Oil (TB) | 250 mL glass jar | >1 tsp | Petroleum Fingerprint | Long-term | Yes |
| Sediment (SD) | Grab: 250 mL glass jar OR Composite - 1 L wide mouth bottle | Full; >30 g ¹ | PAH ¹ Grain size ² ; TOC ² | 4°C, dark: 7 to extract frozen: long-term | Yes |
| Tissue (varies) | Aluminum foil ³ | >10 g ¹ | PAH; % lipid ² | 4°C, dark: 7 to extract frozen: long-term | Yes |

¹ A single sample can be used to confirm petroleum hydrocarbons and for subsequent PAH analysis, but COC must clearly request both; otherwise 1 L for each analysis; TPH analysis not recommended unless petroleum product visible.

² Additional analytes by sample type. Sediment grain size analysis requires additional quart-sized bag if 250 mL sample.

³ Double wrap tissue in aluminum foil with dull side to sample; place inside 2 plastic freezer bags with label in between.

APPENDIX 4 CDFW-OSPR EQUIPMENT & SUPPLY LIST FOR FIELD SAMPLING

Supplies in general “sampling kits” (October 2017)

Notes:

- *Most supplies are in 1 large grey bin, multiple boxes for jars, and 1 clear bin for with bubble wrap, bags, packing tape, etc.*
- *Glass bottle mouth size may vary*

| | |
|---|--------------------|
| Aluminum Foil (50' roll) | 1 |
| Bubble Wrap Sleeves | 56 |
| Clear Packing Tape Roll | 1 |
| Measuring Tape (30m or 50m length) | 1 |
| Paper Towel Roll | 1 |
| Tongue Depressors (set of 20 in foil) | 1 |
| Wet-Ones Wipes Container | 1 |
| Wooden Spoons | 12 |
| Clipboard (the following items inside) | 1 |
| Chain of Custody Forms (triplicates) | 5 |
| NRDA Field Team Check Lists | 2 |
| Sample Collection Summary Form | 12 |
| Photo Log Form | |
| Daily Field Team Forms | 4 |
| Sample Labels (1 per sample container) | 56 |
| Rite in the Rain Field Notebook | 1 |
| Rite in the Rain Pen | 1 |
| Ball Point Pen | 1 |
| Sharpies (or permanent markers) | 2 |
| Photo Scales | 2 |
| Bags | |
| Gallon Size Ziplocs | 14 |
| Quart Size Ziplocs | 10 |
| Kitchen Size Trash Bags | 3 |
| Large Black Trash Bag | 1 |
| Gloves | |
| Nitrile Inner Gloves (wrist length) S/M | 2 boxes (50 pairs) |
| Nitrile Inner Gloves (wrist length) L/XL | 2 boxes (50 pairs) |
| Outer Gloves (elbow length, green) S/M | 4 pairs |
| Outer Gloves (elbow length, green) L/XL | 8 pairs |
| Outer Gloves (shoulder length, blue) S/M | 2 Pairs |
| Outer Gloves (shoulder length, blue) L/XL | 2 Pairs |
| Sample Containers | |
| 4 oz. VOA Vials (with septum lid) | 12 |
| 250 mL Clear or Amber Containers | 12 |
| 250 mL Sheen Containers | 8 |
| 12" Fiberglass Sheets (4/container) | 32 |
| 1 L Amber Bottles (wide mouth) | 12 |
| 1 L Amber Bottles (narrow mouth) | 12 |

APPENDIX 5 CDFW-OSPR NRDA SAMPLING AND ANALYSIS PLAN 'TEMPLATE'

For a copy of the Sampling and Analysis Plan, please contact CDFW-OSPR's NRDA Unit.