APPENDIX L
DISCUSSION OF AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES AT EWA BEACH AND WAIANAE COAST SITES FROM COORDINATING DRAFT

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1.0 Introduction

The Location Assessment (appendix D) described the process by which a slate of five potential shallow-water recovery sites were evaluated in order to support the selection of the highest-rated site as the preferred action (figure D-1). The study compared the physical and environmental attributes of each candidate recovery site in order to support the ranking and decision. Based on the scoring methodology detailed in appendix D, Reef Runway was clearly rated as the preferred site. Of the four other shallow water recovery sites, two (Penguin Bank and Southwest Molokai) were eliminated from further consideration due to their overall poor performance in meeting stated program goals and objectives. The study also concluded that the two remaining sites, Ewa Beach and Waianae Coast, exhibited favorable physical site characteristics and deserved additional study.

Subsequent to the Location Assessment, additional site-specific surveys were performed at Reef Runway, Ewa Beach, and Waianae Coast sites, including detailed fathometric soundings, subsurface video transects, and spot dive observations by marine biologists (appendix J, parts 1 and 2). During the course of these studies, it was determined that Ewa Beach and Waianae Coast were habitat for the threatened green sea turtle, and that shallow water recovery activities would likely affect green sea turtle basking, feeding and resting sites resulting in a harassment "take" under the Endangered Species Act. Further consideration of the Ewa Beach or Waianae Coast sites as alternatives in the Environmental Assessment (EA) would require formal Section 7 consultation. In addition, it was discovered that the Ewa Beach seafloor appeared to steepen rapidly at around 120 feet (36.6 meters), which would challenge basic mission requirements for vessel stability. Both sites would also potentially impact high-use recreational beaches and fishing areas. For these reasons, Ewa Beach and Waianae Coast sites were not carried forward as alternatives in the EA. However, in the event that a Finding of No Significant Impact (FONSI) cannot be reached at the Reef Runway site, and the Navy wishes to pursue additional consultation to achieve a viable site, then Ewa Beach and Waianae Coast could conceivably be reconsidered. For that purpose, the following information on the sites is presented on the affected environment and environmental consequences.

Figure L-1: Potential Shallow water Recovery Site-TO BE SUPPLIED

This appendix is organized in a similar fashion to the EA in that both Ewa Beach and Waianae Coast sites are analyzed for the same critical resources addressed in the EA--that is, water quality, marine biological resources, health and safety, hazardous materials and hazardous waste, and airspace. Each resource area is described in terms of the affected area and the environmental consequence as if each site were being evaluated as an alternative shallow-water recovery site. The discussion herein is limited to Ewa Beach and Waianae Coast sites and does not address potential transit routes or deep relocation site considerations. Figures L-2 and L-3 provide site details for Ewa Beach and Waianae Coast, respectively.

2.0 Water Quality

2.1 Affected Environment

The general composition of the ocean includes water, sodium chloride, dissolved gases, minerals, and nutrients. These characteristics determine and direct the interactions between the seawater and its inhabitants. The most important physical and chemical properties of seawater are temperature, salinity, density, pH, and dissolved gases. Section 3.1 of the EA provides a comprehensive discussion of each of these factors and how they can be altered by plant and animal activities, pollution, and interaction with fresh water.

Complex marine ecosystems occur in Hawaiian waters to depths of 16,500 feet (5,000 meters) and extend inland from the coasts to include coastal marine ponds. Several factors control the variety, distribution, and abundance of marine life, including geographic isolation, subtropical climate, storm waves, and human-caused pollution and development. Water quality at each site, while well mixed, may be degraded by man-made pollutants. Pollutants can generally be characterized as being derived from non-point sources and point sources.

Non-point source pollution is mainly caused by rainfall moving over and through the ground, carrying contaminants. Rainwater, running off roofs, lawns, streets, industrial sites, and pervious and impervious areas, compose surface runoff. As urban runoff travels overland, it can pick up sediment and debris; rubber, oil, grease, and other automobile-related residuals; lawn and garden fertilizers and pesticides; and lead, zinc, asbestos, polychlorinated biphenyls (PCBs), and a host of other pollutants (Belt Collins Hawaii, 1993).

The National Pollutant Discharge Elimination System (NPDES) program is administered by the State of Hawaii's Department of Health, which regulates point sources of pollution. Major point source discharges to Mamala Bay are those from the Sand Island, Honouliuli, and Fort Kamehameha waste-water treatment plants (WWTP) outfalls. Minor point source discharges are those from approximately thirty industrial and agricultural sources. Point source discharges are the sources of conventional pollutants, including biochemical oxygen demand (BOD), total suspended solids (TSS), together with nutrients, indicator bacteria, pathogenic microorganisms, and some metals (Colwell, Orlob, and Schubel, 1996).

Figure L-2: Location of Ewa Beach Site-**TO BE SUPPLIED**

Figure L-3: Location of Waianae Coast Site-TO BE SUPPLIED

Basic water quality standards applicable to potential shallow-water sites in the state of Hawaii are that they shall be free of substances attributable to domestic, industrial, or other controllable sources of pollutants, including the following:

- Materials that will settle to form objectionable sludge or bottom deposits
- Floating debris, oil, grease, scum, or other floating materials
- Substances in amounts sufficient to produce taste in the water or detectable off-flavor in the flesh of fish, or in amounts sufficient to product objectionable color, turbidity, or other conditions in the receiving waters
- High or low temperatures; biocides; pathogenic organisms; toxic, radioactive, corrosive, or other deleterious substances at levels or in combinations sufficient to be toxic or harmful to human, animal, plant, or aquatic life, or in amounts sufficient to interfere with any beneficial use of the water
- Substances or conditions or combinations thereof in concentrations which produce undesirable aquatic life
- Soil particles resulting from erosion on land involved in earthwork, such as the construction of public works; highways; subdivisions; recreational, commercial, or industrial developments; or the cultivation and management of agricultural lands (State of Hawaii, 2000)

The following sections describe the affected environment relative to water quality for Ewa Beach and Waianae Coast sites.

2.1.1 Ewa Beach Site

The State of Hawaii classifies the marine waters along Ewa Beach as Class A. It is the objective of Class A waters that their use for recreational purposes and aesthetic enjoyment can be protected. Any other use shall be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with the recreation in and on these waters. These waters shall not act as receiving waters for any discharge that has not received the best degree of treatment or control compatible with the criteria established for this class (State of Hawaii, 2000).

Major sources of marine pollution at the Ewa Beach site include discharge from Pearl Harbor and the Honouliuli wastewater treatment plant outfall. According to the Mamala Bay study, contamination from the Honouliuli wastewater treatment plant can reach beaches in the area of the Ewa Beach shallow-water recovery site (figure L-4). Peak currents of about 12 inches per second (30 centimeters per second) were measured at the Honouliuli waste-water treatment plant outfall located about 2 nautical miles (3.7

kilometers) from the site in approximately 250 feet (75 meters) of water (Colwell, Orlob, and Schubel, 1996).

Figure L-4: Schematic of Mean Circulation Patterns in Mamala Bay-TO BE SUPPLIED

2.1.2 Waianae Coast Site

The State of Hawaii's classification of water in the Waianae Coast site is also Class A. No specific major sources of pollution have been identified. Water quality is assumed to be equal to or higher than Ewa Beach. Water current velocity measurements are not available, but it is judged likely that the near-shore water current velocity is about 10 inches per second (25 centimeters per second), which is typical of Hawaiian waters.

2.2 Environmental Consequences

The only significant quantities of water quality pollutants expected to be on the *Ehime Maru* during shallow-water recovery operations are petroleum products. Records and personal conversations indicate that at the time of the collision, the *Ehime Maru* carried approximately 65,000 gallons (246,000 liters) of diesel fuel, 1,200 gallons (4,500 liters) of lubricating oil, and 46 gallons (182 liters) of kerosene. The ship was also equipped with a carbon dioxide fire extinguishing system, some smaller fire extinguishers of unknown content, and a small hazardous material storage locker. The contents of the locker are unknown, but may have included paints, cleaning solvents, and small quantities of other chemicals.

An attempt would be made to remove any remaining petroleum products at a shallow-water recovery site following crewmember recovery. The potentially affected areas that could result from a catastrophic uncontrolled release of the estimated maximum amount of petroleum products on board the ship were modeled (appendix H). These simulations indicate with a 90 percent confidence level where the maximum surface area of a fuel/oil release would be expected within progressive time intervals following a release. The actual area would depend on a number of factors including the amount and type of product released (diesel fuel spreads faster, but is more volatile than lubricating oil), the wind direction and strength, tidal cycle, wave height, and ocean temperature and currents at the time of release. However, because of the potential for a release, the U.S. Navy would take all reasonable precautions to ensure that proposed activities are conducted during favorable sea and wind conditions and would be prepared to contain and remove petroleum on the seawater surface.

Therefore, the environmental effect of a petroleum release during proposed activities at both the Ewa Beach and Waianae Coast sites would be minimal. Additionally, removal of any petroleum currently remaining on board the ship would have a long-term beneficial effect on marine water quality.

Some increase in water turbidity may occur during the placing of the *Ehime Maru* on the ocean bottom in shallow water and due to anchoring of the dive support barge and other support ships. Seafloor sediments at either Ewa Beach or Waianae Coast sites are

primarily sand-sized particles and rubble, which would quickly settle to the bottom. Thus, any exceedance of the state water quality criteria for turbidity of Class A marine water would be localized and very short-term; therefore, no adverse impacts to the Class A water quality for turbidity would occur.

2.2.1 Ewa Beach

The Ewa Beach site is located down the prevailing current direction from the mouth of Pearl Harbor and the outfalls of the Honouliuli and Pearl Harbor waste-water treatment plants. This site is expected to have degraded water quality because of existing pollution. Because of the procedures that would be in place to respond to a release, any further reduction of water quality during proposed activities is expected to be minimal and short term.

2.2.3 Waianae Coast

The Waianae Coast site is located down-current from the sources of pollution addressed above, but also is quite distant from these sources. Therefore, this site is expected to have the smallest amount of marine pollution of the two sites. Because of the procedures that would be in place to respond to a release, any further reduction of water quality during proposed activities is expected to be minimal and short-term.

3.0 Marine Biological Resources

3.1 Affected Environment

Complex marine ecosystems occur in Hawaiian waters to depths of 16,500 feet (5,000 meters) and extend inland from the coasts to include coastal marine ponds. Several factors control the variety, distribution, and abundance of marine life, including geographic isolation, subtropical climate, storm waves, and human-caused pollution and development.

All of the activities necessary to implement a recovery operation would be conducted under water. Therefore, the emphasis in this section is on marine ecosystem and biota, including seabirds. Terrestrial biological resources are not addressed since those areas where elements of a Proposed Action would take place onshore are already developed and disturbed. The existing marine biological environment addresses four principal attributes: (1) marine fish and essential fish habitat (EFH), (2) marine mammals, (3); migratory birds associated with the marine environment; and, (4) threatened and endangered species. Shorebirds are also addressed. Section 3.2 of the EA provides a comprehensive discussion of biological diversity to add context to this discussion, as well as including extensive background information on marine fish; essential fish habitat and coral; marine mammals; migratory birds; and threatened and endangered species (including Humpback Whale, Hawaiian Monk Seal, Sperm Whale, Green Sea Turtle, and Hawskbill Sea Turtle).

3.1.1 Ewa Beach

Marine Fish, Essential Fish Habitat, and Coral

A submerged reef extends seaward from the Ewa coast and is widest where it fronts Ewa Beach. Depth increases very gradually offshore with the reef edge located about 4,500

feet (1,500 meters) offshore. Limestone rubble and sand litter the reef terraces present offshore at depths greater than 50 feet (17 meters). Vertical relief is greatest at water depths of 60 to 75 feet (18 to 23 meters) where live corals are abundant. Below about 80 feet (24 meters) the substrate is characterized by a mix of ancient reef limestone, coral rubble, sand, and occasional live coral outcrops. Sand deposits are sometimes deep, and vertical relief is provided by cone-shaped mounds resulting from the activities of burrowing organisms (appendix J, part 1).

An April 22, 2001 survey revealed that corals range from locally abundant on the inshore reaches of the Ewa Beach site where substantial reef development exists, to uncommon on the broad sandy slopes on the seaward side of the site (figure L-5). Coral coverage ranges from 80 to 90 percent in inshore patch reefs to less than 1 percent in offshore areas. The coral community is dominated by cauliflower coral, lobe coral, and finger coral. In some areas, substrate depressions are littered with coral rubble dominated by broken finger coral. The absence of significant coral erosion and epiphytic algal growth on finger coral is suggestive of recent storm wave damage, perhaps associated with regional hurricane disturbances (e.g., Hurricane Iwa) (appendix J, part 1).

A diverse and abundant fish fauna is associated with areas of high coral coverage and vertical relief. During the April 22, 2001 survey, the most common families represented were surgeonfishes (acanthurids), butterflyfishes (chaetodontids), damselfishes (pomacentrids), wrasses (labrids), triggerfishes (balistids) and the zanclid, (Moorish idols). Common invertebrates associated with the study area included sea cucumbers (holothurians), rock boring and black urchins (echinoids), and sea stars (asteroids). Earlier studies identified 59 species of fishes off Ewa Beach, of which 20 were regarded as abundant (U.S. Army Corps of Engineers, 1979).

The Ewa Beach site is within the bottomfish management unit species EFH for eggs, larvae, juveniles, and adult bottomfish. Given the water depths at the Ewa Beach site, the escarpment and slope habitats areas of particular concern would not be within the region of influence (ROI) for the Ewa Beach site. It is also not in the EFH for pelagic management unit species.

Precious coral beds occur in deep inter-island channels and off promontories at depths between 300 and 1,500 meters. Deep-water precious corals include black, pink, gold and bamboo coral. The precious coral beds make up the precious coral management unit species. No known major precious coral bed locations are located in the ROI for the Ewa Beach shallow-water recovery site.

The Ewa Beach site is within the EFH for larvae, juvenile, and adult spiny lobster. However, it is not in the more sensitive designated habitat areas of particular concern for juvenile spiny lobster.

Marine Mammals

The probability of protected spotted dolphins, spinner dolphins, and bottlenosed dolphins being present in the ROI for the Ewa Beach site is high. Ongoing studies of Hawaiian Spinner dolphins show a high probability of encountering this species at the Ewa Beach shallow-water recovery site (Lammers, unpublished data). Spotted dolphins and bottlenosed dolphins may also occur in the area.

Figure L-5: Corals at Ewa Beach Site-TO BE SUPPLIED

Migratory Birds

As noted in section 3.2 of the EA, thirty-nine species of migratory seabirds are known to occur in the Hawaiian Island chain. Twenty-two of these species breed in Hawaii. The Ewa Beach site is within the potential foraging range of many of the seabird species. The foraging range of some of these species is estimated to be between 98 and 300 miles (159 and 480 kilometers). However, it is unlikely that the number of foraging seabirds exceeds about 1.5 seabirds per square mile (0.6 birds per square kilometer) in the ROI at the Ewa Beach site. Some of the seabird species that might be expected in the Ewa Beach site ROI include the red-footed booby, brown booby, masked booby, white-tailed tropic bird, red-tailed tropic bird, sooty tern, brown noddy, and the wedge-tailed shearwater, among others (table 3-3). However, the southern coast of Oahu appears to have less foraging activity by sea birds than other areas of the island.

Common shorebirds in the area of the ROI for the Ewa Beach site include the Pacific golden plover, ruddy turnstone, sanderling, and wandering tattler.

Threatened and Endangered Species

The threatened green sea turtle is common in the Ewa Beach site. The abundance of living coral provides protected ledges where turtles rest. Seagrass and algae provide considerable foraging opportunity for this species. The endangered hawksbill turtle is an uncommon visitor and occasional breeder in Hawaiian waters, but would not be expected in the Ewa Beach site ROI.

The likelihood of any of the endangered or threatened marine mammals being present within the Ewa Beach site is quite low. The humpback whales will have left the area in June on their annual northward migration. Sperm whales almost never occur in shallow waters. Hawaiian monk seals, while seen in the general area once in 1978, are extremely rare in that area.

Two seabird species that occur in the Hawaiian Islands and may occur in the Ewa Beach site ROI are on the U.S. Fish and Wildlife Service list of threatened and endangered wildlife. One species that could forage in the ROI is the Hawaiian petrel, an endangered species. One other species, the Newell's shearwater, is listed as threatened and could also forage in the Ewa Beach site ROI. Both of these listed species breed in Hawaii.

3.1.2 Waianae Coast

Marine Fish, Essential Fish Habitat, and Coral

The Waianae Coast site is situated north of Barbers Point Harbor and offshore of the Koolina Resort, on the leeward side of the Waianae Mountains. The natural shoreline was modified during construction of Koolina Resort to create four protected swimming lagoons.

The Waianae Coast site is dominated by unconsolidated sand that occurs along the largely flat to sometimes undulating reef slope. Water depths range from approximately 40 feet (12 meters) at the east (landward) side of the ROI to 92 feet (28 meters) on the west (seaward) side. With the exception of a well-developed coral reef on the landward side of the study area the substrate is dominated by unconsolidated sand with occasional patches of limestone rubble. Vertical relief in areas of coral development is about 3 to 5 feet (1 to 1.5 meters); elsewhere it is limited to just a few inches (centimeters) of current-rippled sand (appendix J, part 1).

An April 24, 2001 survey identified inshore areas at depths between 50 and 70 feet (15 and 21 meters) with a modestly diverse coral community (figure L-6). This coral community had a coverage in localized areas ranging from an estimated 40 to 50 percent. Cauliflower coral was the dominant coral, followed by lobe coral, finger coral, and rarely, *P. verrucosa.* Upright flattened branches on several colonies were suggestive of the antler coral *Pocillopora eydouxi*. Coral coverage declines significantly offshore where expansive sand flats harbor only an occasional colony of cauliflower coral on an otherwise featureless sand bottom. Coral coverage decreases moving seaward across the study area (appendix J, part 1).

At the time of the April 24 survey, fish were rare across the broad, featureless sandy bottom, except where an occasional colony of cauliflower coral provides habitat. The Hawaiian dascyllus was often abundant in such areas. Small schools of pennant fish (*Heniochus diphreutes)* were present in two areas. Two Hawaiian cleaner wrasses (*Labroides phthirophagus)* were present at a depth of 90 feet (27 meters) on a cleaning station dominated by a steel cable. Moorish idols and several unidentified damselfishes (pomacentrids) were present in the same area as the wrasses. Surgeonfishes (acanthurids), triggerfishes (balistids), wrasses, (labrids), and butterflyfishes (chaetodontids) comprised the remaining fish fauna (appendix J, part 1).

Past surveys conducted in the vicinity of Barbers Point Harbor have identified 57 species of fish from large boulders and a drop-off at a depth of 45 feet (15 meters). The most abundant species were the smalltail wrass (*Pseudojuloides cerasinus),* fantail filefish *(Pervagor spilosoma),* and the blackfin chromis (U.S. Army Corps of Engineers, 1979).

Common invertebrates present included black sea urchins and unidentified sea cucumbers. Both species were associated with coral rubble patches. An unidentified filamentous upright algae with delicate intertwined wispy filaments is common over wide areas of sandy substrate at the Waianae Coast site (appendix J, part 1).

The Waianae Coast site is within the bottomfish management unit species EFH area for eggs, larvae, juveniles, and adult bottomfish.

Given the water depths at the Waianae Coast site, the escarpment and slope habitat areas of particular concern would not be within the Waianae Coast site ROI. The Waianae Coast site would be in the EFH for pelagic management unit species. No known major precious coral beds are located in the Waianae Coast site ROI.

Figure L-6: Corals at the Waianae Coast Site-TO BE SUPPLIED

The Waianae Coast site is, however, within the EFH area for larvae, juvenile, and adult spiny lobster. It is not, however, in the more sensitive designated habitat areas of particular concern for juvenile spiny lobster.

Marine Mammals

The probability of protected spotted dolphins, spinner dolphins and bottlenosed dolphins being present in the Ewa Beach site ROI is high. Ongoing studies of Hawaiian Spinner dolphins show a high probability of encountering this species at the Waianae Coast site (Lammers, unpublished data). Spotted dolphins and bottlenosed dolphins may also occur in the area.

Migratory Birds

Thirty-nine species of migratory seabirds are known to occur in the Hawaiian Island chain. Twenty-two of these species breed in Hawaii. The Waianae Coast site is within the potential foraging range of many of the seabird species. The foraging range of some of these species is estimated to be between 98 and 300 miles (159 and 480 kilometers). However, it is unlikely that the number of foraging seabirds exceeds about four seabirds per square mile (1.6 birds per square kilometer) in the ROI for the Waianae Coast site. Some of the seabird species that might be expected in the ROI include the red-footed booby, brown booby, masked booby, white-tailed tropic bird, red-tailed tropic bird, sooty tern, brown noddy, and the wedge-tailed shearwater, among others. The red-footed and brown boobies are potentially the most common of the seabirds foraging in the ROI.

Common shorebirds in the area of the Waianae site ROI include the Pacific golden plover, ruddy turnstone, sanderling, and the wandering tattler.

Threatened and Endangered Species

The threatened green sea turtle is present in the coral reef areas of the Waianae Coast site, which is expected since they are common from Barbers Point to Waikiki. The likelihood of any of the endangered or threatened marine mammals being present within this site is quite low. The humpback whales will have left the area in June on their annual northward migration. Sperm whales almost never occur in shallow waters. Hawaiian monk seals, while seen in the general area once in 1978, are extremely rare in the area. The

endangered hawksbill turtle is an uncommon visitor and occasional breeder in Hawaiian waters, but would not be expected in the Waianae ROI.

Two seabird species that occur in the Hawaiian Islands and may occur in the area of the Waianae Coast site ROI are on the U.S. Fish and Wildlife Service list of threatened and endangered wildlife. One species that could forage in the ROI is the Hawaiian petrel, an endangered species. One other species, the Newell's shearwater, is listed as threatened and could also forage in the ROI. Both of these listed species breed in Hawaii.

3.2 Environmental Consequences

Biological resources potentially affected by a recovery action are evaluated using an approach based on consideration of habitat quality, duration of the impact, quantity of habitat impacted and susceptibility of the resource to damage. For the recovery operations, the Navy would take every precaution to minimize impacts to marine biological resources. These steps would include notifying the appropriate resource agencies through the Operational Orders and the Incident Action Plan (IAP) to administer necessary assistance if marine mammals or migratory birds should come in contact with an unplanned fuel/oil release.

3.2.1 Ewa Beach

Marine Fish, Essential Fish Habitat, and Coral

Disturbance to benthic biota at the Reef Runway shallow-water recovery site could result from the following actions: (1) deployment and positioning sandbags or other devices on the seafloor (for vessel stabilization); (2) vessel alignment and placement at the recovery site; (3) anchoring and mooring of the recovery vessels; (4) movement of ROVs and ROV umbilical cables; (5) diver activities; (6) dropping *Rockwater 2* or recovery barge equipment or tools onto the reef slope; and (7) an unplanned fuel/oil release.

Deploying and positioning sandbags or other support apparatus on the reef slope (for vessel stabilization). As described in chapter 3 of the EA, the Ewa Beach site is dominated by sand, large swaths of finger coral rubble, and abundant coral development on the inshore (north) side of the of the recovery site. The site is also an important resting and possibly foraging area for the green sea turtle. Deployment and positioning of sandbags or other support apparatus could be handled in a manner to avoid or minimize disturbance to benthic communities. However, elements of implementing the Proposed Action at the Ewa Beach site could potentially disturb green sea turtle feeding and resting habitats and behavior.

Alignment and positioning of the vessel at the recovery site. As with the Reef Runway shallow-water recovery site, alignment and positioning of the *Ehime Maru* at the Ewa Beach site could damage or destroy live corals and other bottom dwelling organisms. The lift ship and diving barge positioning capabilities and the availability of detailed habitat and bathymetric maps would minimize the chance for significant damage to benthic communities. However, engine noise and vibration from the recovery barge could disturb green sea turtles.

Anchoring and mooring of the recovery vessels. The Ewa Beach site is a biologically diverse area. Because the seafloor in the Ewa Beach site is less disturbed and more pristine than the Reef Runway shallow-water recovery site, the placement and positioning of the recovery barge's anchors, mooring chains, and cables and their post-recovery retrieval would have a greater potential to impact coral and other benthic communities. The potential for reef damage is greater at the Ewa Beach site than at the Reef Runway shallow-water recovery site. Because of the greater density of coral on the northern side of the survey area, mooring impacts could be greater than in more offshore areas where coral density and diversity is lower. Engine noise and vibration associated with mooring operations could also cause green sea turtles to flee the area of disturbance, potentially forcing them into other areas where food may be limited and bottom resting areas not providing the same degree of protection as the Ewa Beach site.

4. Movement of ROVs and ROV umbilical cables. The movement of ROV and ROV umbilical cables has the potential to cause minor damage to benthic communities. However, because of the greater abundance and coverage of live coral at the Ewa Beach site, impacts would be expected to have a greater magnitude.

5. Diver activities. The impact of diver activities at the Ewa Beach would largely entail minor disturbance or damage to corals, and benthic organisms and fish associated coral rubble and sand communities. It is unlikely that diver activities alone would contribute to any significant disruption of green sea turtle foraging, basking, and resting sites. However, turtles may leave the area of disturbance for the duration of the recovery efforts, which could change established feeding, basking, and resting habits and behavior.

6. Dropping of equipment and tools from the dive support barge. The accidental dropping of equipment or tools from the recovery barge or other surface support vessels could result in minor damage, particularly to live corals. However, the impact of such an event would be minimal.

7. Release of fuel/oil. There would be a potential for a fuel/oil release at the Ewa Beach site in a recovery operation. The impact of such an event on benthic biota is similar to those described for the Reef Runway shallow-water recovery area. However, the abundance of green sea turtles at the Ewa Beach site increases the potential that basking turtles may be adversely affected by fuel/oil. Containment booms and skimmers would be located onsite. If fuel/oil were to escape from initial containment areas and could potentially affect the marine environment, the booms and skimmers would be positioned to contain and recover the release of fuel/oil. The prevailing northeasterly trade winds and prevailing currents would carry any such surface release or "sheen" in a southwesterly direction where it would volatilize or be skimmed from the surface of the ocean in accordance with the recovery plan. In the event of a Kona Wind (winds from the south) or other unforeseen weather condition, or a change in currents, the booms and skimmers would be repositioned to contain and recover fuel/oil that may have escaped initial containment

The Ewa Beach site is within the EFH for bottomfish management unit species. The Council has designated the water column and all bottom habitat from the shoreline to a depth of 1,312 feet (400 meters) as EFH for bottomfish. The Council also designated all escarpments and slopes between 131 and 919 feet (40 to 280 meters) as a habitat areas of particular concern. There are no habitat areas of particular concern for bottomfish associated with the Ewa Beach shallow-water recovery site because water depths of 120 feet (37 meters) occur at the extreme south (seaward) side of the study area and are at a depth below operational diving requirements. The Proposed Action at the Ewa Beach shallow-water recovery site is not expected to have an impact on the EFH for any developmental stage of the bottomfish management unit species.

As with the Reef Runway shallow-water recovery site, there would be no adverse impacts from recovery activities or a fuel/oil release to the EFH for the crustacean management unit, or on habitat area of particular concern for juvenile spiny lobster. In addition, there would be no impact on EFH within the pelagic management unit.

Marine Mammals

The potential for impacts to marine mammals due to an unplanned release of fuel/oil during the raising of the *Ehime Maru* is remote. It is unlikely that Hawaiian monk seals would be present in the channel area where the vessel rests. There is evidence that dolphins can identify the presence of fuel/oil and avoid it (St. Aubins, et al., 1985); it is likely that the migratory humpback whale would have left for its northern feeding grounds. The sperm whale would not be expected in the relatively shallow water off Penguin Bank (2000 feet [600 meters]) when it apparently prefers deeper waters (6,000 feet [1,800 meters]).

Migratory Sea Birds

Potential impacts to migratory sea birds would be expected to be minimal. Since the numbers of sea birds expected to be foraging in the area is low, 1.5 birds per square mile (0.6 birds per square kilometer), it is unlikely that significant numbers of birds would be adversely affected by fuel/oil. Overall potential impacts from the Proposed Action to migratory seabirds would be expected to be minimal.

Threatened and Endangered Species

The threatened green sea turtle is abundant in the nearshore waters in the area of the Ewa Beach site. The recovery activities are likely to affect the green sea turtle basking, feeding and resting sites, and possibly their behavior at the Ewa Beach site. This would result in a harassment "take" under the Endangered Species Act. Even with the implementation of the fuel/oil release response component of the IAP it is possible that one or more green sea turtles would be oiled. This would also constitute a take under the Endangered Species Act. However, these takes would not jeopardize the continued existence of the species.

The endangered humpback whale would have migrated north from Hawaiian waters by the time the lifting of the *Ehime Maru* at the current location occurs. There would be no effect on the humpback whale. The endangered sperm whale generally occurs further offshore and in deeper water than the current location. Consequently, there would be no

anticipated effect on the sperm whale. The Hawaiian monk seal may only occur in the area of the Proposed Action on a transient basis, if moving from one island to another. The potential that a Hawaiian monk seal would be in the area on the day the vessel would be lifted is very low, and it is expected that there would be no effect on the species.

The potential that the endangered Hawaiian black-rumped petrel and the threatened Newell's shearwater would occur in the area of the current location is remote. If the overall potential for seabird foraging in the area is less than 1.5 birds per square mile (0.6 birds per square kilometer), then the potential for the two listed species to forage over the site is very low. It is expected that there would be no effect on the Hawaiian black-rumped petrel or the Newell's shearwater.

3.2.2 Waianae Coast

Marine Fish, Essential Fish Habitat, and Coral

Disturbances to benthic biota at the Waianae Coast site could result from proposed recovery operations. Overall impacts to the bottom dwelling species are expected to be less at the Waianae Coast site because of the overwhelming importance of unconsolidated sands that dominate the identified recovery location.

1. Deployment and positioning of sandbags or other support apparatus on the reef slope (for vessel stabilization). The deployment and positioning of sandbags or other support apparatus on the seaward reef slope is not expected to involve any discernible impact to benthic communities since the affected area is composed of deep unconsolidated sand with patches of coral rubble. The impact of sandbag deployment and positioning on benthic biota at the Waianae Coast site would be low to non-existent because of the extent of the unconsolidated sandy reef slope.

2. Vessel alignment and placement at the recovery site. The alignment and placement of the *Ehime Maru* at the Waianae Coast site could result in minor disturbances to bottom dwelling organisms. However, the overall density of any such organisms is very low because of the nature of the unconsolidated sand substrate that dominates the study area. Damage to the coral and associated benthic and reef fish community on the submarine slope and terrace is unlikely because of the positioning capabilities of the recovery lift ship and diving barge and the availability of precise habitat and bathymetric maps that have been prepared to understand the distribution and density of sensitive resources. Alignment and placement of the *Ehime Maru* could produce noise and vibrations that could disturb resting green sea turtles transiting the area and those occupying caves and tunnels along the base of the reef terrace. Basking green sea turtles may also experience disturbance resulting from engine noise and vibrations.

3. Anchoring and mooring of the recovery vessels. The placement and positioning of the recovery barge's anchors and mooring chains and cables and their post-operational retrieval have the potential to inflict minor damage upon benthic communities, though bottom impacts are expected to be largely limited to minor changes in the submarine topography

on the sandy reef slope. However, engine noise and vibrations may disturb resting, basking, and/or feeding green sea turtles in the general area of mooring activities.

4. Movement of ROVs, and ROV umbilical cables. As was described for the Reef Runway and Ewa Beach shallow-water recovery sites, ROV-associated actions would likely disturb sand deposits, but impacts on bottom dwelling organisms would not be expected because of the impoverished nature of the unconsolidated sand substrate that dominates the Proposed Action area. ROV activities could also result in disturbances to green sea turtles. However, any such effects are expected to be inconsequential.

5. Diver activities. Diver activities may result in minor impacts on benthic species and slight alterations of bottom topography, but any such effects would not be adverse. Diver activities may also result in disturbances to green sea turtles.

6. Dropping of equipment and tools from the dive support barge. The accidental dropping of equipment or tools from the recovery barge into the water is not expected to produce any environmental effects because of the absence of any benthic fauna associated with the prevailing unconsolidated sand slope that dominates the study area.

7. Release of fuel/oil. During crewmember recovery and cleanup operations, there is the potential for a fuel/oil release. Although containment booms and skimmers would be located onsite, some material may escape from the containment area and could potentially affect the marine environment. A fuel/oil release could result in the fouling of basking green sea turtles.

The Waianae Coast site is within the EFH for bottomfish management unit species. The Council has designated the water column and all bottom habitat from the shoreline to a depth of 1,200 feet (400 meters) as EFH for bottomfish. The Council also designated all escarpments and slopes between 120 and 840 feet (40 to 280 meters) as a habitat area of particular concern. There is no habitat area of particular concern for bottomfish associated with the Waianae Coast site because water depths of 120 feet (40 meters) do not occur within the relocation area. Given the lift ship and diving barge precise positioning capabilities, and the availability of habitat and bathymetric maps, project actions are not expected to disturb the EFH for any developmental stage of the bottomfish management unit species.

As with the Ewa Beach site, there would be no impacts to the EFH for the spiny lobster, or on any habitat areas of particular concern for juvenile spiny lobster. In addition, there would be no impact on EFH for pelagic management unit species at the Waianae Coast site.

Marine Mammals

The potential impacts on marine mammals at the Waianae Coast site due to recovery operations is the same as for the Ewa Beach site.

Migratory Sea Birds

Potential impacts to migratory sea birds would be similar to that described for the Ewa Beach site. With implementation of the fuel/oil release response component of the Proposed Action there should be no impacts on the common shorebirds that frequent the area of the Waianae Coast site.

Threatened and Endangered Species

Potential impacts to threatened and endangered species at the Waianae Coast site would be similar to the Ewa Beach site. The threatened green sea turtle is abundant in the nearshore waters in the area of the Waianae Coast site. The recovery activities would likely affect green sea turtle basking, feeding and resting sites, and possibly their behavior. This would result in a harassment "take" under the Endangered Species Act. Even with the implementation of the fuel/oil release response component of the Proposed Action, it is possible that one or more green sea turtles would be oiled. This would also constitute a take under the Endangered Species Act. However, these takes would not jeopardize the continued existence of the species.

4.0 Health and Safety

Health and safety issues associated with underwater recovery operations include worksite and diver safety, diving and boating mishaps, weather, control of public access, damage to public recreation areas, and oil spill risks.

4.1 Affected Environment

Health and Safety Environment

The Clean Islands Council maintains a Site Safety and Health Plan that focuses on the protection of personnel from serious risks to their physical safety and health while responding to a marine discharge. The Hawaiian Area Contingency Plan identifies health and appropriate personnel protective equipment requirements essential for worker safety. The Plan also identifies site control and security requirements, along with site characterization and monitoring requirements. There are standard procedures for reporting medical and fire emergencies, including a medical plan that identifies nearby hospitals and clinics.

Hospitals capable of responding to health and safety issues include Queens Medical Center and Kuakini Hospital in downtown Honolulu, and Airport Urgent Care at Honolulu International Airport. A Safety Officer, field operators, and group supervisors are identified in the Site Safety and Health Plan. For divers, close-by decompression chambers are at Pearl Harbor.

The operational phase of an oil spill response is often characterized by changing conditions at and near the spill site. Accordingly, these oil spill responders are trained to recognize and monitor hazard conditions and implement standard operating procedures and response strategies to protect themselves while effectively responding to the emergency.

Hazardous weather conditions could pose a safety hazard. The National Weather Service and the Navy Meteorological Office at Pearl Harbor are the primary sources for obtaining weather information. Adverse weather conditions include high wind and sea conditions, tsunamis, and hurricanes. It is the commander's responsibility to evaluate if the weather conditions are potentially hazardous, based on available information, experience, and the operational limits of the recovery vessels.

Public Safety

This section provides an overview of the existing activities that could affect public health and safety. Additionally, those public recreational areas at risk from a mishap in the ROI are identified.

There are a large variety of ocean and coastal activities in the nearshore and offshore waters of the Hawaiian Islands. These activities include recreational and commercial fishing, swimming, board and body surfing, scuba diving, shell collecting, and aquarium fish collecting. There are a large number of public recreation areas and natural resource management areas (state parks, wildlife reserves, etc.) along Hawaii's coastal areas. These areas draw visitors from all over the world and are a driving force behind the State's economy. In addition, the nearshore and coastal waters are highly productive areas for the commercial fishing industry. Thus, Hawaiian waters and shorelines have an unusually high level of environmental and economic sensitivity. Generally, nearshore and offshore areas are open to commercial and recreational users at all times and are not restricted. Presently, the only nearshore and offshore waters on Oahu that are off-limits to public access are those areas surrounding Department of Defense facilities (e.g., Pearl Harbor and Kaneohe Bay). Special activities that might result in the temporary restriction of access into otherwise open waters are promulgated through a weekly Notice to Mariners (NOTMAR).

Existing public health and safety risks in the ROI are associated with recreational activities, commercial boating, and potential hazardous materials release from shipping and industrial activities. Hazardous materials releases are managed in accordance with appropriate federal, state, and local regulations.

The existing shoreline at the shallow-water recovery site has existing sewage outfalls and petroleum product off-loading facilities at designated anchorage areas. All of these facilities pose some existing potential for hazard to public safety.

Diver Safety

The U.S. Navy conducts diving activities in accordance with *The U.S. Navy Diving Manual*. This manual provides the latest procedures and equipment for conducting safe diving activities. *The U.S. Navy Diving Manual* identifies the required equipment and procedures for using surface-supplied diving equipment as well as the requirements for emergency gas supply equipment that is used for enclosed space diving. (U.S. Navy, 1999).

4.1.1 Ewa Beach

The Ewa Beach site is outside the Pearl Harbor Defensive Sea Area. There are no restrictions to commercial or recreation activities in the Ewa Beach site ROI. Ocean activities occurring at site include such activities as netting, fishing, tropical fish collecting, surfing, scuba diving, paddling, kayaking, and shelling. Ewa Beach Park, located about 1.6 nautical miles (3 kilometers) to the northeast, is a typical public beach park with some offshore fishing and diving. Oneula Beach Park is 2.1 nautical miles (2 kilometers) due north and has similar activities (U.S. Department of the Interior, 1998b). A commercial net pen cage aquaculture site is located in close proximity to the Ewa Beach site. There are petroleum product off-loading and pipeline facilities to the west of the Ewa Beach site in the Barbers Point area.

4.1.2 Waianae Coast

The Waianae Coast site is northwest of Barbers Point Harbor. There are no restrictions to commercial or recreation activities in this area. Ocean activities occurring in the site ROI include such activities as net fishing, pole and line fishing, tropical fish collecting, surfing, scuba diving, paddling, kayaking, and shelling. The Waianae Coast area has a number of coastal near-shore activities. Ko Olina Beach Park is 0.8 nautical mile (1.6 kilometers) southeast; Makiawa Beach Park is 1.1 nautical miles (2 kilometers) north-northeast; and Kahe Point Beach Park, a well known snorkeling area, is 1.4 nautical miles (2.5 kilometers) north (U.S. Department of the Interior, 1999). There are petroleum product off-loading and pipeline facilities to the south of the Waianae Coast site in the area of Barbers Point.

4.2 Environmental Consequences

Potential health and safety issues at Ewa Beach and Waianae Coast sites would be associated with nearby public recreational activities and recovery diver safety. These potential safety issues would be the same for all potential shallow-water sites and are addressed below. Specific issues related to each site follow this discussion. Health and safety issues related to an unplanned fuel/oil release is addressed in section 4.4 of the EA (Hazardous Materials and Hazardous Waste). As analyzed in that section, the Navy would be prepared with the appropriate plans and equipment for a maximum credible release; thus, there should be minimal increased safety risk to public health and safety.

Public Safety

The diving operation could generate intense interest and curiosity from the public. The ability to establish and control public access would be essential to protect the safety of both the general public and divers. To ensure the protection of all persons and property, a 1-nautical-mile (1.85-kilometer) over-water safety perimeter around the recovery operations would be established and implemented for operations in these areas. Therefore, there would be minimal risk to the public during these activities.

Diver Safety

Diver safety would be of paramount importance, and all safety measures would be followed during recovery operations. The Navy would establish a controlled zone around the recovery operations to ensure diver safety. Voice communication integrity for the

diving recovery operations would be maintained by establishing a minimum flight ceiling over the area and for a radius of 1,000 feet (300 meters). Establishment of this ceiling would be accomplished through temporary flight restrictions issued by the FAA and enforced by Honolulu International Airport authorities. A more detailed discussion of airspace and related issues is provided in section 4.5 of the EA (Airspace).

During the recovery effort, there would be a potential for an increased risk to diver safety. To ensure diver safety, all operations are conducted in accordance with *The U.S. Navy Diving Manual*. This manual, which is based on the Navy's long history of conducting diving operations, provides the latest procedures and equipment for conducting safe diving activities. *The U.S. Navy Diving Manual* identifies the required equipment and procedures for using surface-supplied diving equipment as well as the requirements for emergency gas supply equipment that is used for enclosed space diving. Operating procedures and emergency procedures would be in place to support operation of the system and recovery from emergency situations. In addition, a Diving Medical Officer would be onboard the diving support vessel at all times and would be accompanied by diving medical technicians. Standby divers would be available at all times to render emergency assistance. To ensure appropriate communication between divers, the dive teams would practice together for at least a week before the recovery operations. Given the in-place procedures and equipment, there would no increased risk to diver safety compared to other diving operations. The Recovery Officer would establish appropriate diver safety requirements for all aspects of environmental response operations. Further, divers would not undertake any action that might result in an immediate release of oils or hazardous substances into the shallow-water marine environment (NAVSEA, 2001b).

In summary, the Navy has a long history of providing for diver safety and has extensive experience in conducting diving operations similar to those associated with this recovery effort. Every effort would be taken during recovery operations to minimize the risk to diver health and safety; therefore, no impacts would be expected.

4.2.1 Ewa Beach

The Ewa Beach site is west of the Reef Runway shallow-water recovery site and is outside the Pearl Harbor Defensive Sea Area. There are no restrictions to commercial or recreational activities in this area. To minimize the risk to the public and the recovery operation, the Navy would establish a 1-nautical-mile (1.85-kilometer) over-water safety perimeter around the recovery operations in this area. This area is not within line-of-site monitoring from the Pearl Harbor tower of the Defensive Sea Area; therefore, Navy-owned security boats would be on patrol 24 hours a day, 7 days a week, to prohibit small boats from intruding upon the operation. Special activities such as these that might result in the temporary restriction of access into otherwise open waters would be promulgated through a weekly NOTMAR. Overall, there would be minimal risk to the public or recovery divers from operations at this shallow-water site.

As with the Reef Runway shallow-water recovery site, the Fleet Recompression Chamber would be less than 15 minutes away by boat.

4.2.2 Waianae Coast

This Waianae Coast site is northwest of Barbers Point Harbor and is also outside the Pearl Harbor Defensive Sea Area. The potential health and safety issues and over-water safety perimeter would be similar to those described for the Ewa Beach site.

In the event of a life-threatening emergency, this site would be farther away from the Fleet Recompression Chamber at Pearl Harbor than the Ewa Beach site. An emergency medical evacuation would require transfer to shore by boat and then a helicopter flight; however, this evacuation could be achieved in less than 30 minutes. Because of the additional time response at this site, there would be an increased risk to diver safety.

5.0 Hazardous Materials and Hazardous Waste

5.1 Affected Environment

The affected environment for hazardous materials and hazardous waste includes the sensitive resource areas that could potentially be affected by an unplanned release of oil, and any existing hazardous waste areas that may occur in the ROI.

The Emergency Ship Salvage Material (ESSM) system at Pearl Harbor, Hawaii, is part of a worldwide network of warehouses that stores and maintains a significant stockpile of oil pollution abatement equipment. The ESSM system pollution abatement equipment includes open ocean boom and skimming systems, specialized inland response systems, floating storage and offload systems.

All equipment is available for immediate deployment and is available to all federal agencies. Equipment is capable of containment and recovery of many grades of refined and crude oils, including heavy residual oils, and marine and jet fuels. The ESSM system includes a range of equipment as listed in table L-1.

Table L-1: ESSM System Equipment

Spilled Oil Recovery	Casualty Off-Loading	Ancillary Support Equipment
Containment booms	Oil transfer pumps and hoses	Personnel support vans
Open-ocean skimmers	Floating hose systems	Maintenance vans
Small skimmers	Hot tap systems	Support vessels
In-situ burning equipment	Portable generators	Cleaning equipment
Sorbent materials	Portable firefighting pumps	Command vans
Vacuum recovery systems	Hydraulic power packs	Communications systems
Floating storage bladders	Salvage equipment	Small boats all-terrain vehicles material handling equipment

The Clean Islands Council is a consortium of regular and associated members working together with the entire Hawaii community to foster, train, and demonstrate safe work practices related to responding to an oil spill. The Hawaii Area Committee is a spill preparedness and planning body made up of industry, federal, state, and local agency representatives including the Clean Islands Council. The Federal On-Scene Coordinator coordinates the activities of the Area Committee and assists in the development of a comprehensive Area Contingency Plan that is consistent with the National Contingency Plan.

The Hawaii Area Contingency Plan provides guidance in the preparation of a proper Site Safety and Health Plan for all IAPs related to oil spills. During a spill event the Clean Islands Council Spill Response Operations Center is essentially a well-outfitted strategic and tactical response management center. Communications include 35 phone lines, 9 fax machines, 2 LANs, radio and internet capability, as well as video and digital imagery capability. (Clean Islands Council, 2001)

5.1.1 Ewa Beach

There are no known hazardous materials and hazardous wastes present at the Ewa Beach site. Current water quality conditions are discussed in section 3.1.3.2 of the EA.

5.1.2 Waianae Coast

There are no known hazardous materials and hazardous wastes present at the Waianae Coast site. However, there is one existing product off-loading facility in the Barbers Point area to the southeast of the Waianae Coast site. Current water quality conditions are discussed in section 3.1.3.3 of the EA.

5.2 Environmental Consequences

The potential impacts from the release of hazardous materials and hazardous waste could occur during recovery operations. The impacts would be associated with the unplanned release of fuel/oil that may remain in the vessel which could affect water quality, biological resources, and land areas used for a variety of public and private activities. This section addresses the potential for a release and the procedures and equipment in place to minimize harm to the environment.

In the event of an unanticipated release, the Navy would initially mobilize the appropriate equipment and implement the procedures to quickly contain and clean up a fuel/oil release. In addition, overflights would be continued during the diving operations to monitor for a fuel/oil release, especially if ongoing operations indicate a higher likelihood of a fuel/oil release (NAVSEA, 2001a).

Because of the potential for a fuel/oil release to affect the nearshore environment, the Navy would implement procedures prior to transit of the *Ehime Maru* to shallow-water. These measures would include waiting outside the shallow-water recovery sites until the trade winds are blowing off the coast, tides and currents are offshore, and booms and skimmer vessels are in place. To ensure favorable current conditions, real-time surface and

column current monitoring would occur. Before initiation of transit, modeling would be conducted to determine optimal sea-state and wind conditions for transit. Overall, these procedures should minimize the potential for a fuel/oil release during the final transit and relocation to the shallow-water recovery sites.

The environmental impact of a fuel/oil release is generally greater in shallow, near-shore waters than at offshore, deep-water recovery site. The closer proximity to sensitive nearshore resources is a concern, but the immediate environmental impact of released fuel/oil is minimal compared with true shallow-water depths (of a few feet or less). Both mechanical recovery and dispersant operations are viable options; however, the urgency of response would be greater closer to shore. With appropriate approvals, and agreement of net environmental benefit, any fuel/oil not immediately recovered by surface fuel/oil skimmers close to the source would be immediately dispersed by dispersant systems as required. Mechanical recovery is the preferred option, but dispersants would be applied to prevent released fuel/oil from reaching and impacting sensitive shallow-water, inter-tidal, and shoreline areas. Dispersants would become the primary release response option for shallow-water operations if on-scene sea-state conditions preclude safe mechanical recovery operations (NAVSEA, 2001a) and assuming agreement as to net environmental benefit and approval by the Federal On-Scene Coordinator. Helicopters would be used to assist in determining the movement of the release on the water surface to ensure appropriate boom placement. Because of the procedures and equipment to contain and clean up an unplanned fuel/oil release, only minimal impacts to the environment would be expected.

At all of the potential recovery sites there is the potential for public and commercial use activities. These activities include netting, fishing, tropical fish collecting, surfing, scuba diving, paddling, kayaking, aquaculture, and shelling. Section 3.3 of the EA provides an overview of these resources. Every effort would be taken to contain and clean up any release such that no fuel/oil would impact the shoreline. The fuel/oil release response outlined previously would be implemented to protect these sensitive resources; therefore, it is anticipated that there would be minimal impact to the to these resources from a fuel/oil release.

6.0 Airspace

6.1 Affected Environment

Airspace Use

The overall airspace use environment in the ROI is described below in terms of its principal attributes. These attributes are controlled and uncontrolled airspace, enroute low-altitude airways, airports and airfields, and air traffic control. Other airspace use attributes, such as special use airspace, military training routes, and high-altitude jet routes, are not relevant here. This is because the jet routes, all above 18,000 feet (5,486 meters), are well above the activities proposed, and because there is no special use airspace, and no military training routes in the ROI. The airspace use over the individual sites associated with the Proposed Action is described in following sections.

Controlled/Uncontrolled Airspace

The ROI is dominated by the Class B Airspace that lies above and around Honolulu International Airport. It is composed of the "upside-down wedding cake" layers typical of the Class B Airspace that surrounds the nation's busiest airports. It consists of a "core" surface area that extends from the surface up to 9,000 feet (2,743 meters) above sea level out to a 5-nautical-mile (9-kilometer) radius. This "core" surface area is, in turn, surrounded by several layers of varying floor altitudes but the same ceiling altitude of the "core" area (figure L-7).

Figure L-7: Airspace ROI-TO BE SUPPLIED

Below the Class B layers, between the 5-nautical-mile (9-kilometer) radius "core" area and 15 nautical miles (28 kilometers) out, is Class E controlled airspace with a floor 700 feet (212 meters) above the surface. This layer of controlled airspace is itself underlain with uncontrolled (Class G) airspace from the surface to 700 feet (212 meters). Further out to 20 nautical miles (37 kilometers), the underlying airspace is also uncontrolled (Class G) airspace, with varying altitudes.

Enroute Airways

A number of low altitude enroute airways enter or transect the ROI (figure L-7). These airways are referred to as Class E airspace, established in the form of a corridor. The corridor's centerline is defined by radio navigational aids. They form a network serving aircraft up to, but not including, 18,000 feet (5,450 meters) above sea level. The sections below identify the nearest enroute airways.

Airports and Airfields

Honolulu International Airport and Hickham Air Force Base lie on the northern edge of the airspace use ROI. Honolulu International Airport is Hawaii's principal airport, with approximately 1,000 operations (departures and arrivals) per day in the year 2000 (Schlapak, 2001a). A total of 22.3 million passengers arrived in fiscal year 1999 (Hawaii Department of Transportation, 2001). Figure K-1 in appendix K shows the precision instrument approach zone slopes for both runways at Honolulu International Airport. These show the standard instrument approach procedure flight paths for arriving aircraft. Figures K-1 through K-8 in appendix K show the various instrument approach patterns for the different runways at the airport. There are no temporary flight restrictions (TFRs) currently used at the airport.

In addition to the fixed-wing operations at Honolulu International Airport, commercial tour operator helicopters account for approximately 30 operations per day. Their normal flight routes hug the coast of Oahu east of the airport toward Makapuu Point. They typically either circle the entire Koolau Range returning to the airport over Kamehameha Highway, down the central part of Oahu to Pearl Harbor and the airport, or fly over the Pali Pass. The U.S. Coast Guard and local Fire and Ambulance helicopters are also based at the airport (Schlapak, 2001a, b).

Kapolei/Kalaeloa (John Rodgers Field) Airport just east of Barbers Point on the coast west of Honolulu had approximately 440 operations (departures and arrivals) in the year 2000, primarily touch-and-go training takeoffs and landings by light-plane pilots, the National Guard, and others (Schlapak, 2001a). Figures K-8 and K-9 in appendix K show the instrument approach patterns for the airport.

Air Traffic Control

Air traffic in the ROI within the 12-nautical-mile (22.2-kilometer) territorial waters limit of the United States is managed by the Honolulu Air Traffic Control Center (ARTCC). The airspace beyond these territorial waters is in international airspace. Because it is in international airspace, the procedures of the International Civil Aviation Organization (ICAO) are followed (ICAO, 1985, 1994). The FAA acts as the United States agent for aeronautical information to the ICAO, and air traffic in the ROI is managed by the Honolulu ARTCC and the Oakland ARTCC.

6.1.1 Ewa Beach

Controlled/Uncontrolled Airspace

The Ewa Beach site lies under one of the "upside-down wedding cake" layers of Honolulu International Airport's controlled (Class B) airspace. Beneath this layer, is another layer of controlled (Class D) airspace surrounding Kapolei/Kalaeloa (John Rodgers Field) Airport. The Class D airspace extends from the surface to 2,500 feet (762 meters) above sea level (figure L-7). Two-way radio communication must be established with the Honolulu Air Traffic Control prior to entry and thereafter while in this Class D airspace.

Enroute Airways

The V12-15 airway over the southern coast Oahu, passes just north of the Ewa Beach site (figure L-7).

Airports/Airfields

The Ewa Beach site is approximately 2 nautical miles (3.7 kilometers) from the Kapolei/Kalaeloa (John Rodgers Field) Airport. Although well removed from the airport's regular approach and departure patterns, it does lie below the missed approach path for one of the runways (figure K-8, appendix K).

Waianae Coast

The Waianae Coast site lies under one of the "upside-down wedding cake" layers of Honolulu International Airport's controlled (Class B) airspace. Beneath this layer is another layer of controlled (Class D) airspace surrounding Kapolei/Kalaeloa (John Rodgers Field) Airport. The Class D airspace extends from the surface to 2,500 feet (762 meters) above sea level (figure L-7). Two-way radio communication must be established with the Honolulu Air Traffic Control before and after entry while in this Class D airspace.

Enroute Airways

The V12-15 airway passes to the south of the Waianae Coast shallow-water recovery site (figure L-7).

Airports/Airfields

The Waianae Coast shallow-water recovery site is approximately 4 nautical miles (7.4 kilometers) from the Kapolei/Kalaeloa (John Rodgers Field) Airport (figure L-7). It is well removed from the airport's approach and departure patterns (figures K-8 and K-9, appendix K).

One other distinction is that the transit route from the Ewa Beach shallow-water recovery site does not pass under the inner "core" of the Class B airspace that extends to the surface (figure L-7).

Environmental Consequences

This section describes the potential impacts to airspace as a result of the relocation and recovery activities. These activities would require the implementation of a TFR area that could affect airspace.

A TFR would be imposed by the FAA in the airspace above the recovery effort operations. The TFR, allowed by Federal aviation regulations, would prevent an unsafe congestion of sightseeing aircraft above the lifting operation. It would also ensure that operations would not interfere with communications on the decks of vessels involved in the operation. A NOTAM would be issued to alert pilots of the TFRs. The NOTAM would contain specific information for pilots, including the location, effective period, and the exact area and altitudes affected. The NOTAM would also include the FAA coordination facility and commercial telephone number, the telephone number of the U.S. Navy office directing the recovery operations, and any other information considered appropriate by the Honolulu Air Traffic Control Center.

6.2.1 Ewa Beach

Controlled/Uncontrolled Airspace

The Ewa Beach site lies in the Class D airspace associated with Kapolei/Kalaeloa (John Rodgers Field) Airport. This airspace extends from the surface to 2,500 feet (757 meters) above sea level. All aircraft flying within this controlled airspace would already be required to establish two-way radio communication with air traffic control before entering and while flying in it. Establishment of a 1-nautical-mile (1.85-kilometer) radius TFR, and release of a NOTAM would provide additional control of the airspace above the operation. It would temporarily change the nature of the airspace above Ewa Beach site, but would not adversely impact navigable airspace in the ROI.

Enroute Airways

There is one enroute low altitude airway, V12, in the airspace above the Ewa Beach site. However, it passes just north of the site over the adjacent shoreline. Therefore,

establishment of the TFR would not require aircraft flying in the airway to change their course or flight altitude. Consequently, there would be no impacts to the surrounding low altitude airways from operations at the Ewa Beach site and no potential indirect impacts from shift in aircraft noise contours.

Airports/Airfields

Kapolei/Kalaeloa (John Rodgers Field) Airport lies just to the west of the Ewa Beach site, but well removed from the airport's regular aircraft approach and departure patterns. The establishment of a 1 nautical mile (1.85 kilometer) radius TFR, and release of a NOTAM would control the airspace above the operation. The missed approach path for the airport's runway, used when aircraft cannot complete a landing safely (see appendix K) is closer, but still would be west of the TFR area. Therefore, the TFR associated with shallow-water recovery operations would not restrict access to, or affect the use of any airfield or airport available for public use, and would not affect airfield/airport arrival and departure traffic flows.

6.2.2 Waianae Coast

Controlled/Uncontrolled Airspace

The Waianae Coast site also lies in the Class D airspace associated with Kapolei/Kalaeloa (John Rodgers Field) airport. However, unlike the Ewa Beach site, it is some distance away, around and north of Barbers Point. This airspace extends from the surface to 2,500 feet (757 meters) above sea level. All aircraft flying within this controlled airspace would already be required to establish two-way radio communication with air traffic control before entering and while flying in it.

Establishment of a 1-nautical-mile (1.85-kilometer) radius TFR and release of a NOTAM would provide additional control of the airspace above the operation. These measures would temporarily change the nature of the airspace above the Waianae Coast shallow-water recovery site, but would not adversely impact navigable airspace in the ROI.

Enroute Airways

There are no low altitude enroute airways in the Waianae Coast site ROI. Therefore, establishment of TFR area would not require aircraft flying in the airway to change their course or flight altitude. Consequently, no impacts to the surrounding low altitude airways would result from operations at the Waianae Coast site.

Airports/Airfields

Although located in the Class D airspace associated with Kapolei/Kalaeloa (John Rodgers Field) Airport, the Waianae Coast site is well removed from the airport's regular aircraft approach and departure patterns. Therefore, the TFR associated with shallow-water recovery operations would not restrict access to, or affect the use of, any airfield or airport available for public use, and would not affect airfield or airport arrival and departure traffic flows. As a result, there would be no potential impacts from the shift in aircraft noise contours.

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