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An Assessment of Chemical Contaminants in the Waters Around Cocos Island, Guam Using Polyethylene Passive Water Samplers

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An Assessment of Chemical Contaminants in the Waters Around Cocos Island, Guam Using Polyethylene Passive Water Samplers

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ABSTRACT

This report summarizes the results from a project led by NOAA's National Centers for Coastal Ocean Science (NCCOS) with local partners, and with funding from NOAA's Coral Reef Conservation Program (CRCP). The objective was to characterize chemical contaminants in the water column around Cocos Island in Cocos Lagoon, Guam, using an array of passive water samplers. The work was a follow-up from a project in 2015 to characterize chemical contaminants in sediments and fish in Cocos Lagoon, in which low levels of contaminants were found in sediments, while fish collected adjacent to Cocos Island contained elevated, in some cases highly elevated levels of PCBs and DDT.

For this project, an array of polyethylene device (PED) passive water samplers were deployed in transects radiating out from around Cocos Island, to assess if dissolved concentrations of contaminants in the water column could be a major source for their uptake in aquatic biota.

Results indicated low concentrations of hydrocarbons on the PEDs at a number of sites. Detections of PCBs and DDT were limited to nearshore sites. The PEDs with the highest concentrations of PCBs and DDT were two that were buried in the sand below the high water mark, adjacent to the site of the former LORAN station. PEDs deployed further from shore did not have any detectable levels of PCBs or DDT. From this work, it appears that uptake of these contaminants directly from the water column into biota such as fish in nearshore areas, likely occurs, however, accumulation through the food chain may also be important.

INTRODUCTION

Located in the western Pacific Ocean and the most southerly and largest (both in area and population) member of the Mariana Islands, Guam has a land area of approximately 550 square kilometers, and a maximum altitude of 405 meters (Emery, 1962). The capitol of Guam is Hagåtña, located towards the middle of the island (Figure 1).

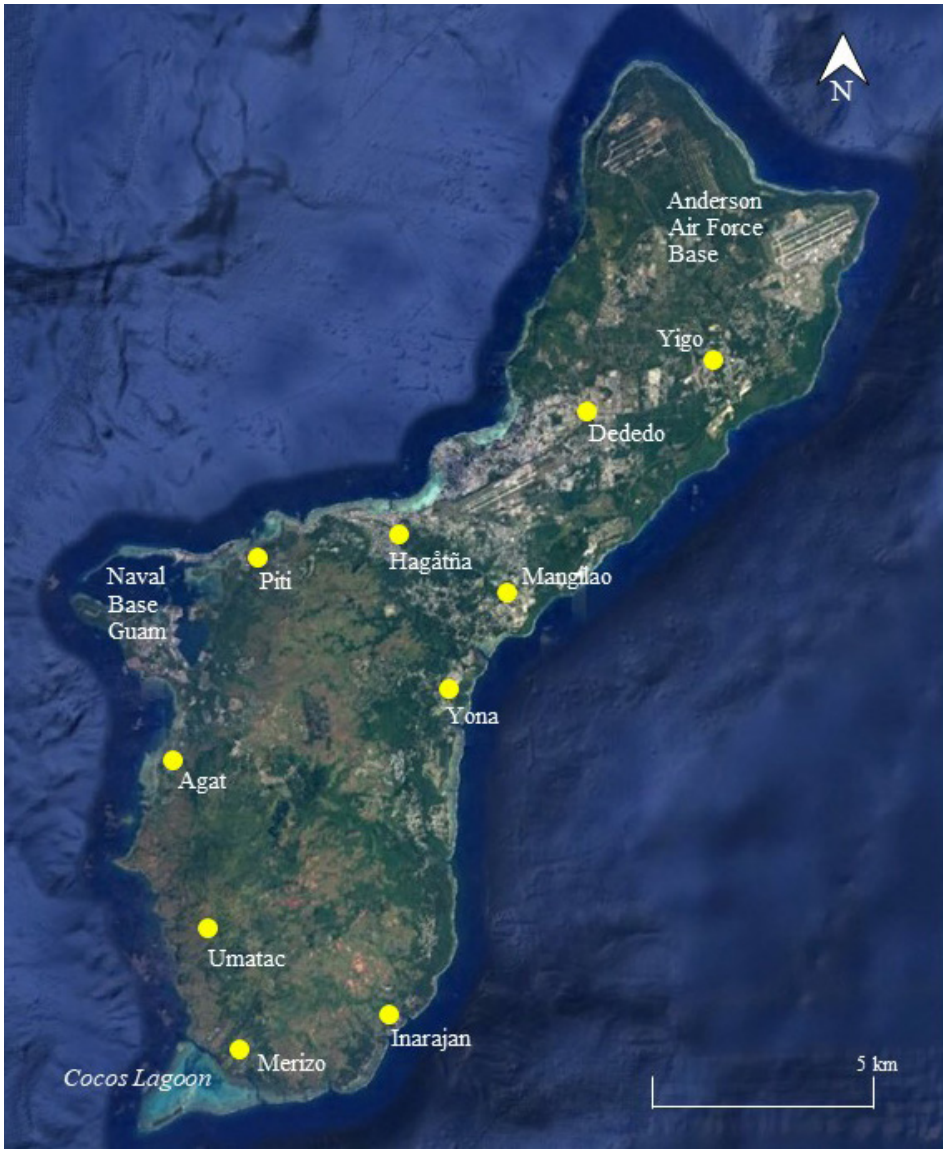


Figure 1. The island of Guam.

The northern half of Guam is a broad limestone plateau bordered by steep cliffs, while the southern half of the island is a dissected volcanic upland fringed with limestone, primarily along the east coast (Tracey *et al*., 1964). At the southern tip of Guam is Cocos Lagoon (Figure 1), an atoll-like coral reef lagoon. Geologically, Cocos Lagoon is thought to have grown on the basement of the Umatac formation, a thick sequence of volcanic rock, which originated in the southern central portion of Guam, and is named after the town of Umatac on the west coast of the island.

Triangular-shaped, Cocos Lagoon is approximately 8.9 km long on the south side, and 4.4 km at its widest point. The lagoon is separated from the open ocean by a series of fringing reefs and barrier islands, of which Cocos Island is the largest (Figure 2). Cocos Lagoon is an important area for subsistence fishing, and a popular area for recreational activities including fishing, boating and diving. The lagoon is fairly shallow, with an average depth of approximately 2 meters. Towards the center of Cocos Lagoon, depths

approach 12 meters. Two channels, the Manell Channel and the Mamaon Channel, connect Cocos Lagoon with the open sea. The Manell Channel with depths up to 11 meters, drains to the Pacific Ocean while the Mamaon Channel, with depths to nearly 26 meters, drains to the Philippine Sea. Current (water flow) studies conducted by Randall *et al*. (1975) indicated that the southern barrier reef of Cocos Lagoon is exposed to higher wave energy which results, when normal tradewinds are blowing, in a greater volume of water entering from the south, and producing a general northward current within the lagoon.

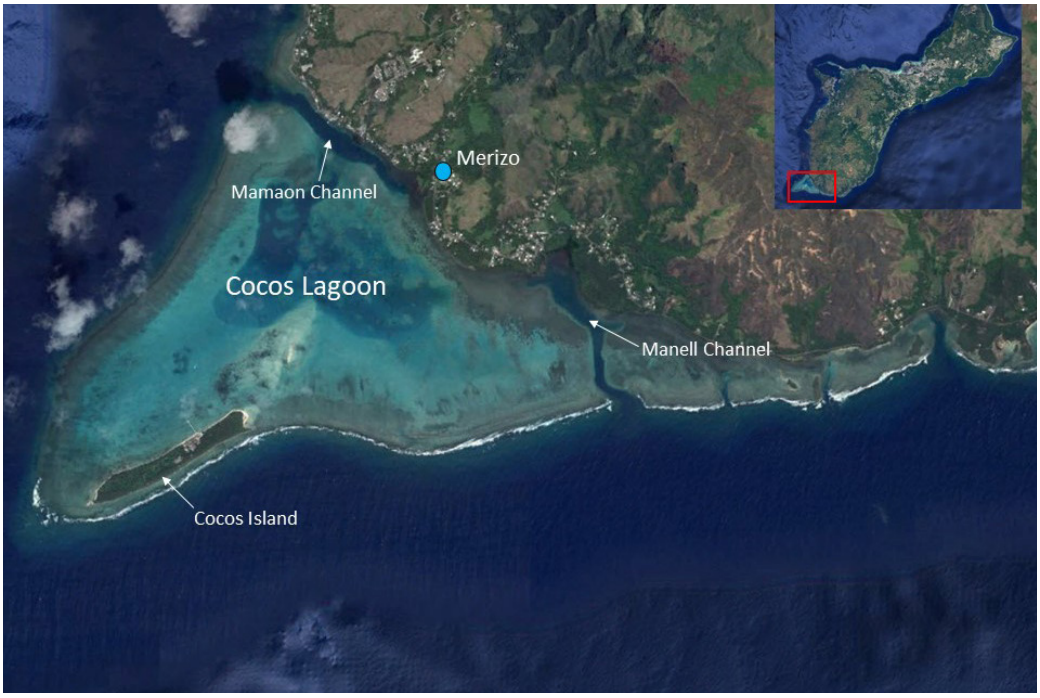


Figure 2. Cocos Lagoon, Guam including Cocos Island.

Cocos Island is thought to have formed through the accumulation of unconsolidated materials carried by waves and currents, and has a maximum elevation of less than 2 meters (Emery, 1962). Between 1944 and 1963, the US Coast Guard (USCG) operated a long-range navigation or LORAN station towards the southern end of Cocos Island. LORAN was a hyperbolic radio navigation system used by the US beginning in World War II. A map showing the approximate location of the Cocos Island LORAN station can be seen in Figure 3. Electrical transformers at the station were used to convert the power supplied by diesel generators to run the LORAN equipment. Anecdotal information provided by former USCG personnel stationed at Cocos Island, during the time the LORAN station was operational, indicated that debris from the station was sometimes taken to the lagoon side of the island to be carried away by passing typhoons, or was buried on the island (Element Environmental, 2014).

It should be noted that passing typhoons have had significant impacts on Cocos Island. In 1949, for example, Typhoon Allyn overwashed Cocos Island, and was said to have removed most of the USCG installation (Emery, 1962). Significant overwash also occurred during Typhoon Russ in 1991 (Richmond and Jaffe, 1991). In addition to the intentional disposal of materials, overwash from typhoons would seem to be another mode for the introduction of debris and chemical contaminants into surrounding waters. In either case, a chemical contaminant issue associated with the LORAN station site on Cocos Island has been identified (Element Environmental, 2014).

Project Background

Beginning in 2005, surveys were conducted on Cocos Island by USCG contractors, to remove debris from the former LORAN site, and to quantify the types and levels of chemical contaminants that might be present in soils, sediments and aquatic biota. Elevated levels of several contaminant classes including polychlorinated biphenyls (PCBs) were found in the soils on Cocos Island, and in fish in the waters around Cocos Island (Environet, 2005; Element Environmental, 2008, 2013, 2014). In 2007, approximately 380 cubic yards of PCB-contaminated soil were removed from Cocos Island and then shipped to a disposal facility on the US mainland (Element Environmental, 2014). The area was then backfilled with clean native soil.

In 2006, a fish consumption advisory was put in place for all of Cocos Lagoon (Guam EPA, 2006). The advisory recommended that the community limit or avoid the consumption of fish caught in and around Cocos Lagoon. That advisory remains in place.

In 2014, local resource managers reached out to NOAA's National Centers for Coastal Ocean Science (NCCOS) to request a survey of chemical contaminants present in Cocos Lagoon, including the area around Cocos Island. In May 2015, scientists from the Guam Environmental Protection Agency (Guam EPA) and NOAA's NCCOS, with funding from NOAA's Coral Reef Conservation Program (CRCP),

conducted a project to characterize chemical contaminants in sediments and fish throughout Cocos Lagoon.

Results from the 2015 project indicated low levels of chemical contaminants in sediments. However, a number of fish collected from around Cocos Island had highly elevated levels of PCBs, along with the banned organochlorine insecticide DDT (dichlorodiphenyltrichloroethane) (Hartwell *et al*., 2017). Almost all of the fish collected from around Cocos Island had concentrations of PCBs and DDT above subsistence and even recreational fisher screening values established by the US Environmental Protection Agency (USEPA, 2000), indicating a potential public health concern, and the need for more intensive site-specific monitoring and/or further evaluation of the human health risk from the presence of these chemical contaminants in fish.

Sediments typically serve as a reservoir for chemical contaminants that accumulate in aquatic organisms, however, sediments may not be the only source or medium through which contaminants are accumulating in the fish in the waters around Cocos Island. Sediments collected during the May 2015 project were composed primarily of sand, and contained only low levels of PCBs and DDT. As will be discussed later, sediments containing higher levels of sand typically have little affinity for organic contaminants like PCBs and DDT.

Figure 3. Location of the former LORAN Station Cocos Island, and current resort area.

A possibility discussed by project partners was that dissolved (i.e., in the water column) concentrations of contaminants, perhaps transported by groundwater or subsurface water from Cocos Island into nearshore waters, could be a source for their direct uptake in fish.

These discussions led to the current project, funded by CRCP, in which passive water samplers were deployed in the nearshore waters around Cocos Island. The goal was to assess whether PCBs and perhaps DDT were being transported in the dissolved phase, either as a result of surface water runoff that might occur after a rainfall event, or through some type of groundwater input from Cocos Island, that could subsequently be taken up by fish and other marine organisms from the water column.

Passive Water Samplers

Traditionally, the detection of organic (i.e., carbon-containing) chemical contaminants in the water column required the collection, filtration and extraction of large volumes of water (Adams *et al*., 2007). The reason is that many organic chemical contaminants have a low solubility in water, and large volumes of water have to be extracted in order to detect the low concentrations (parts per billion, ppb, or even lower) typically present. Passive water samplers have gained widespread use as an alternative for detecting chemical contaminants in the aquatic environment, particularly organic chemicals that have low water solubility, often termed hydrophobic organic contaminants.

All passive water samplers have some type of collecting medium or material which accumulates chemical contaminants from the water over a period of time. The assessment of contaminants over time is particularly useful, as it results in a lower detection limit, and can provide longer term estimates of the average concentrations present in the environment. In contrast, the collection and analysis of a discrete water sample, sometimes termed a "grab sample", provides an indication of the presence of contaminants at one point in time.

A variety of passive waters samplers have been developed. Some of the earlier samplers were developed in order to mimic the uptake of hydrophobic compounds by fish

(Lohman, 2012). SPMDs, or semi-permeable membrane devices, for example, are constructed out of a low-density polyethylene bag filled with triolein, a triglyceride. Organic compounds pass through the pores in the polyethylene and are then sequestered into the triolein. The extraction and analysis of SPMDs can be difficult, because of the triolein, which requires additional steps to separate out the compounds of interest (Lohmann, 2012; Adams *et al*., 2007).

Solid-phase microextraction devices, or SPMEs are typically constructed out of fiber-optic cables (Burgess, 2012). While the inner glass fiber core does not readily adsorb contaminants, the outer, insulating coating of polydimethylsiloxane is used as an effective material for adsorbing organic contaminants. Because the amount of the contaminant-adsorbing polymer is small (coating on the outside of the glass fiber cable), however, the detection limits are frequently not as low as SPMDs (Adams *et al*., 2007).

More recently, single-phase (without the triolein) polymers including silicone, polyoxymethylene, and polyethylene have been used (Lohmann, 2012). The polymer is typically attached to some of type of rigid frame and then suspended in water, sediment, or both. One advantage of using these single-phase materials is cost. The polyethylene used in passive water samplers is relatively inexpensive, and is frequently constructed of the same material sold as plastic drop cloths in hardware stores (Burgess, 2012).

All of these approaches take advantage of the phenomenon that hydrophobic organic compounds will partition out of water when possible, into more hydrophobic materials or matrices including biota, sediments, or in the case of passive water samplers, materials like polyoxymethylene, polyethylene or triolein.

Passive water samplers provide important information on the presence of the dissolved concentration of a compound present in the environment, either in the water column or in the sediment. In the water column, hydrophobic organic contaminants can be in the freely dissolved form or associated with materials including suspended particles, organic matter, and colloids. It is thought that contaminants in the freely dissolved form are the most bioavailable to aquatic organisms (Mayer *et al*., 2014; Burgess *et al*., 2015; Adams *et al*., 2007). In sediments, the freely dissolved concentration of a hydrophobic organic contaminant in the sediment porewater (*i.e*., water in between sediment particles) is also thought to be the most bioavailable, and most likely associated with adverse biological effects (Mayer *et al*., 2014).

Passive water samplers can also be used to estimate ambient concentrations of contaminants in the water column. At equilibrium, the concentration of the chemical contaminant in the passive water sampler and that remaining in the water can be estimated by the equation:

$$C_{free} = \frac{C_{PS}}{K_{PS\text{ - free}}} \qquad (1)$$

where
C_{free} is the aqueous concentration of the contaminant
C_{PS} is the concentration of the contaminant on the passive sampler, and
$K_{PS\text{ - free}}$ is the polymer to water partition coefficient.

Equilibrium is usually not achieved during a typical deployment (~30 days) of a passive water sampler. Mayer *et al*. (2014) have noted that attaining equilibrium for passive water samplers, particularly for hydrophobic organic contaminants can take months to years. Given this, a common practice is to introduce performance reference compounds or PRCs to the polymer in the passive water sampler prior to deployment. The concentration of the PRCs at the beginning and end of the deployment can then be used to adjust Equation 1. The PRCs used have physicochemical properties similar to the chemical contaminants of interest. Burgess *et al*. (2015) provide a good summary of the use of PRCs. For each of the PRCs, the exchange or transfer rate coefficient k_e is calculated based on the duration of the deployment using the following equation:

$$k_e = \frac{\ln \frac{C_{PRCi}}{C_{PRCf}}}{t} \qquad (2)$$

where
C_{PRCi} is the initial concentration of the PRC
C_{PRCf} is the final concentration of the PRC within the passive water sampler polymer, and t is time.

The exchange rate coefficient is then substituted back into Equation 1, to calculate the C_{free} concentration of the contaminant of interest as shown in Equation 3:

$$C_{free} = \frac{C_{ps}}{(1 - e^{-K_e t})\, K_{ps\text{ - free}}} \qquad (3)$$

The estimate of the concentration of each contaminant of interest found on the PEDs which have a corresponding PRC is done in the same way.

The estimated water column concentrations for the contaminants of interest were not available in time for publication in this report. As a result, the concentrations of the contaminants analyzed are reported as the concentration found on the passive water samplers deployed at each of the sites for this study. The estimated water column concentrations are scheduled to be included in a later publication. However, a number of observations can be made by looking at the concentration of the contaminants on the samplers deployed around Cocos Island, and will be discussed in the following sections.

MATERIALS AND METHODS

The passive water samplers deployed around Cocos Island were polyethylene devices or PEDs, and were provided by project partners at the USEPA. An image of the PED and PED frame can be seen in Figure 4. The polyethylene sheet (PED) is placed within the frame.

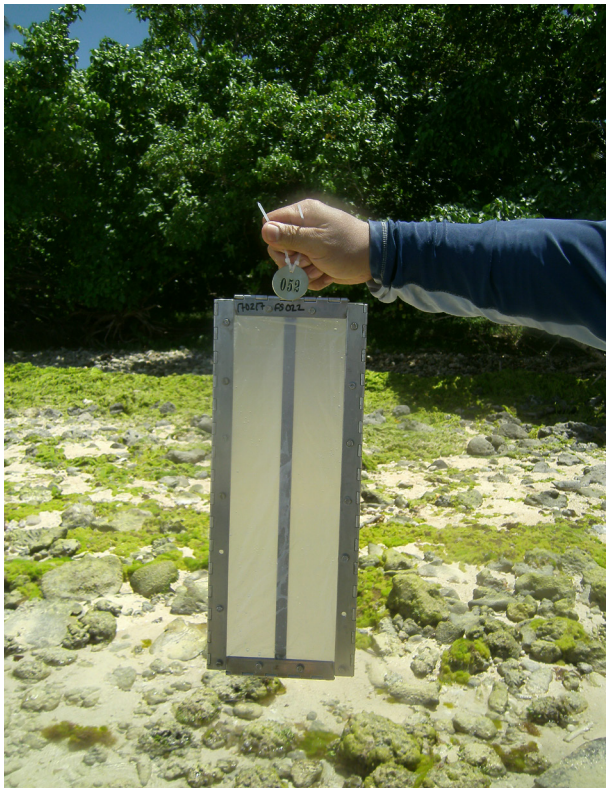


Figure 4. Image of PED and PED frame prior to deployment.

Conversations with project partners, including Guam EPA, USEPA, and USCG, resulted in the identification of 26 sites around Cocos Island (Figure 5). The USCG requested two sites be established just below the high water mark as well, along the beach close to the site of the former LORAN station. The PEDs at Sites 9-1 and 9-2 were buried in the sand and the location of these can also be seen in Figure 5. The PEDs for this project were deployed under Army Corps of Engineers Permit POH-2017-166. In addition, consultations were carried out with the Guam Historic Preservation Office, along with ESA (Endangered Species Act) and EFH (Essential Fish Habitat) consultations with NOAA's National Marine Fisheries Service (NMFS), prior to the field work.

Deployment of PEDs

The PEDs were stored in a freezer at Guam EPA headquarters until they were ready for deployment. Prior to deployment, the frozen PEDs were transferred to coolers and kept chilled using ice packs until they were installed. Once a sample location was identified, field personnel hammered two support lengths of rebar per PED into the sand for anchoring. In the case of pavement hard-bottom, an underwater drill was used to drill a guide bore hole for the rebar. The rebar was then pounded into place. Once the support structures were installed, the combination PED and frames were removed from the cooler and their serial numbers recorded. Nitrile gloves were worn by personnel at each site, both in the water and in the boat for those handling the PEDs. Each combination frame and PED was also assigned a brass tag with a unique number to ensure proper identification of the PED at the time of retrieval. Each tag was ziptied to the frame before installation. After the serial number and identifier tags were recorded and attached, the PED and frame were transported to the installation site and ziptied to the support rebar stakes.

The PEDs were deployed in the shallow waters around Cocos Island. Water depths where the PEDs were deployed ranged from 0.3 to 2.4 meters (Appendix A). PED frames were oriented with their long edge parallel to the sediment, so that the PED was exposed to the water. Figure 6 and the cover of this report show two PEDs deployed at a site, with this orientation.

The insertion of the PEDs into the sediment at three sites (9-1, 9-2, and 4-3 #035), was done in order to assess the movement of subsurface or groundwater adjacent to Cocos Island (Site 9-1 and 9-2) or further out (Site 4-3 #035), possibly carrying dissolved chemical contaminants. The insertion of PEDs into the sediment was accomplished by slowly moving the PED frame back and forth along the long edge until the whole frame was below the surface of the sediment. This was done to reduce the disturbance of the surrounding sediment as much as possible. The PEDs were deployed between 18 and 22 September 2017 (Appendices A and B).

Retrieval of PEDs

The retrieval of the PEDs was done by Guam EPA. The retrieval occurred between 27 and 30 October 2017 (Appendix C). Wearing nitrile gloves, each PED was cut out of the frame, any biofouling was wiped off, and then the PED was placed into a corresponding labeled jar. While there

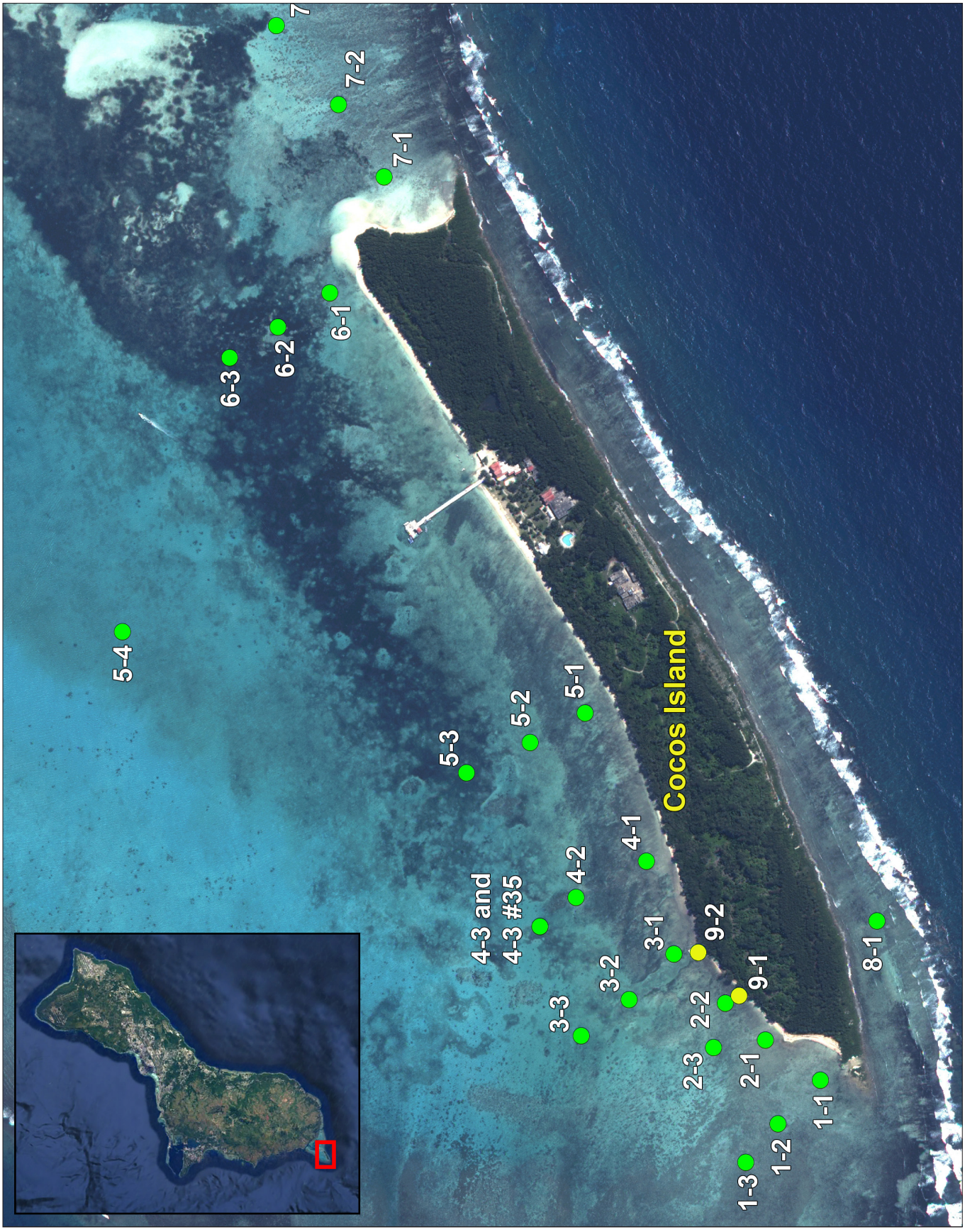


Figure 5. Location of the PEDs successfully deployed and retrieved from around Cocos Island, Guam. Yellow dots indicate the location of those PEDs buried in the sand just below the high water mark.

was some biofouling noticed on the PEDs retrieved after deployment, the degree of biofouling, even those embedded in the sand appeared roughly the same between sites. The jars were then placed in a cooler on ice while in the field, and then placed in a freezer at Guam EPA. The PEDs that had been deployed at site 8-2 were not found during retrieval.

Figure 6. Image of NOAA scientist installing duplicate PEDs in the waters around Cocos Island, Guam.

There was no direct overnight shipping available from Guam to TDI-Brooks, International, the NOAA analytical contract laboratory in College Station, Texas where the PEDs were analyzed. As a result, the PEDs were first shipped overnight to the NOAA Pacific Islands Fisheries Science Center in Honolulu, Hawaii. The samples were placed in a walk-in freezer at the facility for a few days, and then shipped out to TDI-Brooks.

Analysis of PEDs

Two PEDs were deployed at each site. At TDI-Brooks, the two PEDs from each site were extracted and analyzed as one sample, in order to improve detection of the contaminants. At TDI-Brooks, the length and width of each PED was measured, and each PED was cut into strips and placed into an Erlenmeyer flask. Surrogates and spike compounds (for recovery assessment), along with 150ml of dichloromethane were added to the Erlenmeyer flask and placed on a shaker table for 8hrs. After that, the dichloromethane from the flask was passed through filters, and the extract from each PED was then concentrated and purified using silica and alumina to a final concentration to 1ml.

The analysis then proceeded using gas chromatography/mass spectrometry or gas chromatography/electron capture. Detailed descriptions of NOAA's National Status and Trends (NS&T) protocols, including quality assurance/quality control (QA/QC) used in the analysis of the organic contaminants, can be found in Kimbrough *et al*. (2006).

Chemical Contaminants Analyzed

The PEDs were analyzed for a suite of 171 organic contaminants by TDI-Brooks, using protocols established by the NS&T Program. The PEDs were analyzed for hydrocarbons, organochlorine pesticides, and for PCBs. The list of chemical contaminants analyzed on the PEDs is shown in Table 1. No metals were analyzed, as the PEDs are not efficient at accumulating metals. In addition, the sediments and fish from the 2015 project contained relatively low levels of metals (Hartwell *et al*. 2017). Below is a more detailed description of the chemical contaminants analyzed for this project.

Polycyclic Aromatic Hydrocarbons (PAHs)

The PEDs were analyzed for 59 polycyclic aromatic hydrocarbons or PAHs. For this report, the sum of those PAHs is termed total PAHs. Polycyclic aromatic hydrocarbons are associated with the use and combustion of fossil fuels (e.g., oil and gas) and other organic materials (e.g., wood and trash) (ATSDR, 1995). The PAHs analyzed are two to six ring aromatic compounds. A number of PAHs bioaccumulate in aquatic and terrestrial organisms, are toxic, and some including benzo[a]pyrene, benz[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, and indeno[1,2,3-c,d]pyrene, are likely carcinogens (ATSDR, 1995). PAHs were analyzed using gas chromatography/mass spectrometry in the selected ion monitoring mode.

Polychlorinated Biphenyls (PCBs)

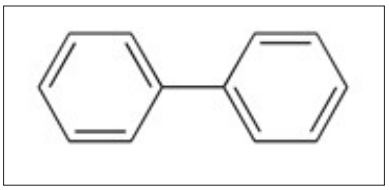
Commonly referred to as PCBs, polychlorinated biphenyls are synthetic compounds that have been used in numerous applications ranging from electrical transformers and capacitors, to hydraulic and heat transfer fluids, to pesticides and paints. PCBs were identified by partners as a contaminant class of particular concern in Cocos Lagoon, and were subsequently found at elevated concentrations in a number of fish collected from around Cocos Island in 2015 (Hartwell *et al*., 2015). Typically, NOAA's NS&T Program analyzes for 38 PCBs. For this project, an expanded list of 81 PCBs were analyzed (Table 1). In this report, the sum of those PCBs is termed total PCBs.

Table 1. Chemical contaminants analyzed on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam.

PAHs - Low MW	PAHs - High MW	PCBs	PCBs (continued)	PCBs (continued)	Organochlorine Pesticides
Naphthalene	Fluoranthene	PCB1	PCB86	PCB180	Aldrin
1-Methylnaphthalene	Pyrene	PCB7/9	PCB87/115	PCB183	Dieldrin
2-Methylnaphthalene	C1-Fluoranthenes/Pyrenes	PCB8/5	PCB88	PCB185	Endrin
2,6-Dimethylnaphthalene	C2-Fluoranthenes/Pyrenes	PCB15	PCB92	PCB187	Heptachlor
1,6,7-Trimethylnaphthalene	C3-Fluoranthenes/Pyrenes	PCB16/32	PCB95	PCB189	Heptachlor-Epoxide
C1-Naphthalenes	Naphthobenzothiophene	PCB18	PCB97	PCB191	Oxychlordane
C2-Naphthalenes	C1-Naphthobenzothiophenes	PCB22/51	PCB99	PCB194	Alpha-Chlordane
C3-Naphthalenes	C2-Naphthobenzothiophenes	PCB24/27	PCB101/90	PCB195/208	Gamma-Chlordane
C4-Naphthalenes	C3-Naphthobenzothiophenes	PCB25	PCB105	PCB196/203	Trans-Nonachlor
Benzothiophene	Benz[a]anthracene	PCB26	PCB107	PCB199	Cis-Nonachlor
C1-Benzothiophenes	Chrysene	PCB28	PCB110/77	PCB200	Alpha-HCH
C2-Benzothiophenes	C1-Chrysenes	PCB29	PCB114/131/122	PCB201/157/173	Beta-HCH
C3-Benzothiophenes	C2-Chrysenes	PCB31	PCB118	PCB205	Delta-HCH
Biphenyl	C3-Chrysenes	PCB33/53/20	PCB126	PCB206	Gamma-HCH
Acenaphthylene	C4-Chrysenes	PCB40	PCB128	PCB209	DDMU
Acenaphthene	Benzo[b]fluoranthene	PCB41/64	PCB129/126		2,4'-DDD
Dibenzofuran	Benzo[k]fluoranthene	PCB42/59/37	PCB136		4,4'-DDD
Fluorene	Benzo[e]pyrene	PCB43	PCB138/160		2,4'-DDE
C1-Fluorenes	Benzo[a]pyrene	PCB44	PCB141/179		4,4'-DDE
C2-Fluorenes	Perylene	PCB45	PCB146		2,4'-DDT
C3-Fluorenes	Indeno[1,2,3-c,d]pyrene	PCB46	PCB149/123		4,4'-DDT
Carbazole	Dibenzo[a,h]anthracene	PCB47/48/75	PCB151		1,2,3,4-Tetrachlorobenzene
Anthracene	C1-Dibenzo[a,h]anthracenes	PCB49	PCB153/132		1,2,4,5-Tetrachlorobenzene
Phenanthrene	C2-Dibenzo[a,h]anthracenes	PCB52	PCB156/171/202		Hexachlorobenzene
1-Methylphenanthrene	C3-Dibenzo[a,h]anthracenes	PCB56/60	PCB158		Pentachloroanisole
C1-Phenanthrene/Anthracenes	Benzo[g,h,i]perylene	PCB66	PCB166		Pentachlorobenzene
C2-Phenanthrene/Anthracenes		PCB70	PCB167		Endosulfan II
C3-Phenanthrene/Anthracenes		PCB74/61	PCB169		Endosulfan I
C4-Phenanthrene/Anthracenes		PCB77	PCB170/190		Endosulfan Sulfate
Dibenzothiophene		PCB81	PCB172		Mirex
C1-Dibenzothiophenes		PCB82	PCB174		Chlorpyrifos
C2-Dibenzothiophenes		PCB83	PCB176/137		
C3-Dibenzothiophenes		PCB84	PCB177		

Abbreviations: MW, molecular weight; PAH, polycyclic aromatic hydrocarbons; PCB, polychlorinated biphenyl; HCH, hexachlorocyclohexane; DDMU, 1-chloro-2,2-(p-chlorophenyl)ethylene; DDT, dichlorodiphenyltrichloroethane; DDD, dichlorodiphenyldichloroethane; DDE, dichlorodiphenyldichloroethylene

PCBs were manufactured in the US between 1929 and 1977. PCBs have a biphenyl ring structure (two benzene rings with a carbon to carbon bond, see inset) and a varying number (1-10) of chlorine atoms. There are 209 individual PCB compounds or congeners possible, depending on the number and orientation of the chlorine atoms. In the United States, all PCBs were produced by a single manufacturer, and the commercial products were referred to as Aroclors, which are mixtures of PCB congeners.



Biphenyl ring structure.

Approximately 65 percent of PCBs manufactured in the US were used in electrical applications (Eisler and Belisle, 1996). The manufacture of PCBs in the US was banned in 1979, due to their toxicity. Because PCBs bioaccumulate and degradation proceeds slowly, they are now ubiquitous environmental contaminants. Exposure to PCBs in fish has been linked to reduced growth, reproductive impairment, and vertebral abnormalities (Eisler and Belisle, 1996). PCBs have also been shown to cause cancer in laboratory animals, and have been linked to cancer in humans (ATSDR, 2000). PCBs were analyzed using gas chromatography/electron capture detection.

Organochlorine Pesticides

Beginning in the 1950s and continuing into the early 1970s, a series of chlorine containing hydrocarbon insecticides were used to control mosquitoes and agricultural pests. One of the best known of the organochlorine pesticides was the insecticide dichlorodiphenyltrichloroethane, or DDT. For this project, 31 organochlorine pesticides including DDT and its metabolites, were analyzed.

The use of organochlorine pesticides, including DDT was banned due to their environmental persistence, potential to bioaccumulate, and chronic toxic effects on nontarget organisms. Organochlorine pesticides are typically neurotoxins, and DDT along with PCBs have also been shown to interfere with the endocrine system (Rogen and Chen, 2005). The DDT metabolite DDE (dichlorodiphenyldichloroethylene) was specifically linked to eggshell thinning in birds, particularly in raptors, but also in pelicans (Lincer, 1975). A number of organochlorine pesticides are toxic to other nontarget aquatic organisms as well, including crayfish, shrimp and some species of fish. While DDT was banned by the USEPA for most uses in the US beginning in 1972, DDT is still used effectively in some developing countries, for example, inside of living areas to help control mosquitoes that can transmit malaria.

Most uses of the organochlorine insecticide chlordane were banned in 1978, and all uses were banned by 1988. A primary non-agricultural use of chlordane was in the treatment of wooden structures to prevent damage by termites.

Because of their persistence and heavy use in the past, residues of organochlorine pesticides can be found in the environment and in biota. The persistence of these compounds and toxicity to nontarget organisms continues to be an environmental concern. The organochlorine pesticides were analyzed using gas chromatography/electron capture detection.

Statistical Analysis

To assess differences in nearshore sites versus those further out in Cocos Lagoon, or for lateral differences for the contaminants of interest, a Shapiro-Wilk test was first run on the PED data to see if it was normally distributed. None of the data were normally distributed, and transformations were not effective. As a result, Wilcoxon nonparametric comparisons were used.

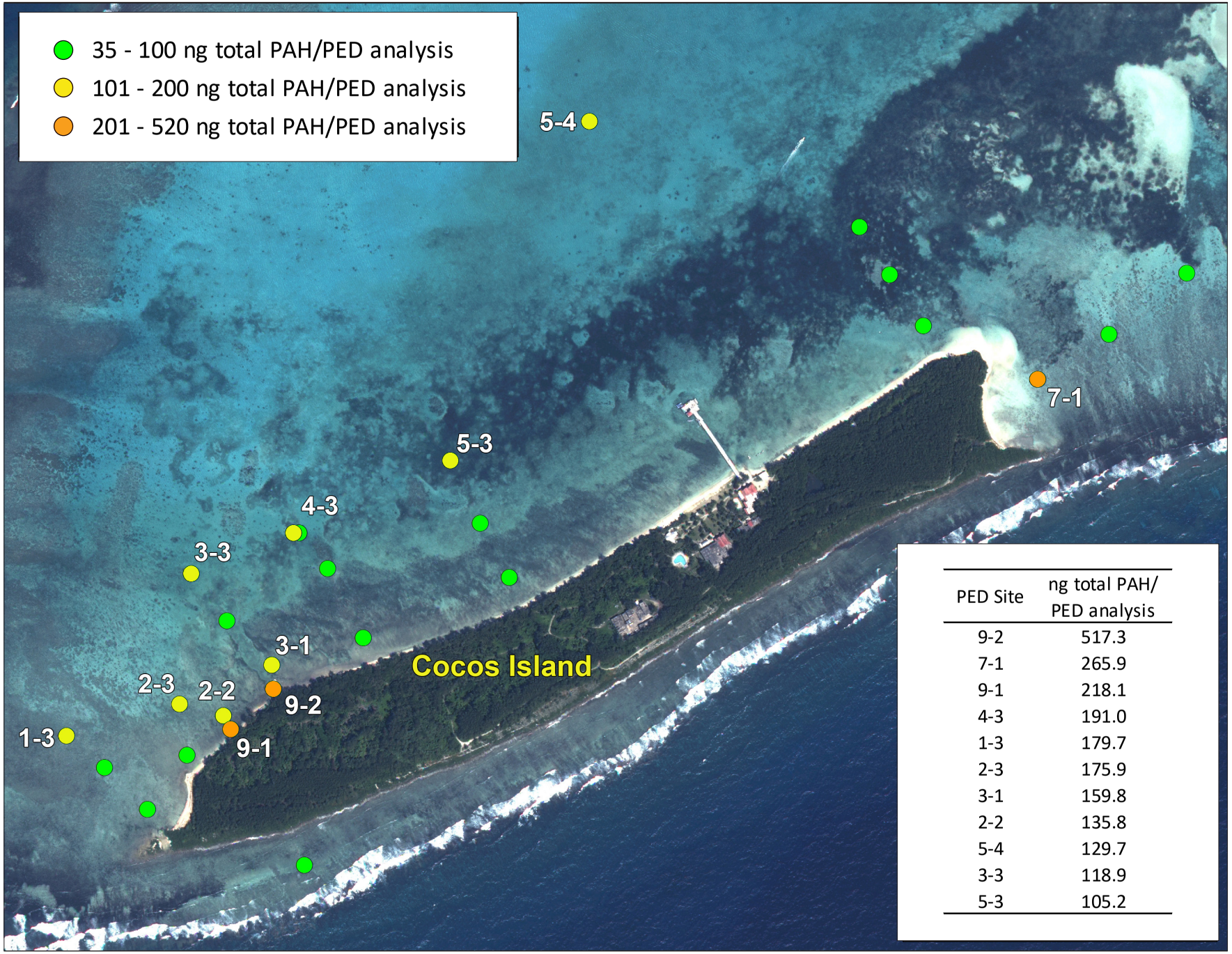
RESULTS AND DISCUSSION

Results from the analysis of the chemical classes analyzed for this project are discussed below. Information on the results for each compound can be found in Appendices E to L at the end of this report.

Total PAHs Detected on the PEDs

A map showing the results from the analysis of PAHs on the PEDs can be seen in Figure 7. Data for individual PAHs can be found in Appendix E. Figure 7 contains an inset table which details the highest total PAH concentrations (yellow and orange markers) found on the PEDs. The concentration on the PED analyzed from site 9-1 was 218 ng/PED analysis. The concentration at Site 9-2 was higher yet, 517 ng/PED analysis. Interestingly, Site 7-1 on the northeastern end of the island had the second highest total PAH PED concentration. Sometime between 2006 and 2010, nearshore sediments in the area of site 9-1 and 9-2 may have been moved to the northeast side of Cocos Island, perhaps to rebuild beaches impacted by past storms. It is possible that the somewhat elevated concentration of total PAHs may be related to this, however, the intentional relocation of sediments to the northeast side of the island could not be confirmed for this report.

Over half of the sites where the PEDs were deployed had total PAH concentrations of less than 100 ng/PED analysis. Hartwell *et al*. (2017) found low levels (<10 ng/g) of total PAH in the sediments around Cocos Island. This was likely due in part to the structure of the sediment around Cocos Island. Sand was the major (>75 percent) sediment type



PED Site	ng total PAH/ PED analysis
9-2	517.3
7-1	265.9
9-1	218.1
4-3	191.0
1-3	179.7
2-3	175.9
3-1	159.8
2-2	135.8
5-4	129.7
3-3	118.9
5-3	105.2

Figure 7. Concentration of total PAHs found on the PEDs deployed around Cocos Island, Guam.

found around Cocos Island by Hartwell *et al.* (2017), which has little affinity for organic, hydrophobic contaminants like PAHs. The reason for this is that organic hydrophobic contaminants are more likely to bind to sediments with higher organic carbon content along with smaller grain size, which are typically found in silty (e.g., muddy) sediments.

A number of the PEDs deployed in the nearshore locations (e.g., 9-1, 9-2, and 7-1) appeared to have somewhat higher total PAH concentrations. However, a nonparametric Wilcoxon test on nearshore versus PED sites further out in the array, failed to detect (ChiSquare = 2.6740, p = 0.2626) any differences in total PAH concentration moving from nearshore areas to the sites further out in Cocos Lagoon. There were also no lateral (i.e., moving along the shore) differences (ChiSquare = 9.9062, p = 0.2717) in total PAHs.

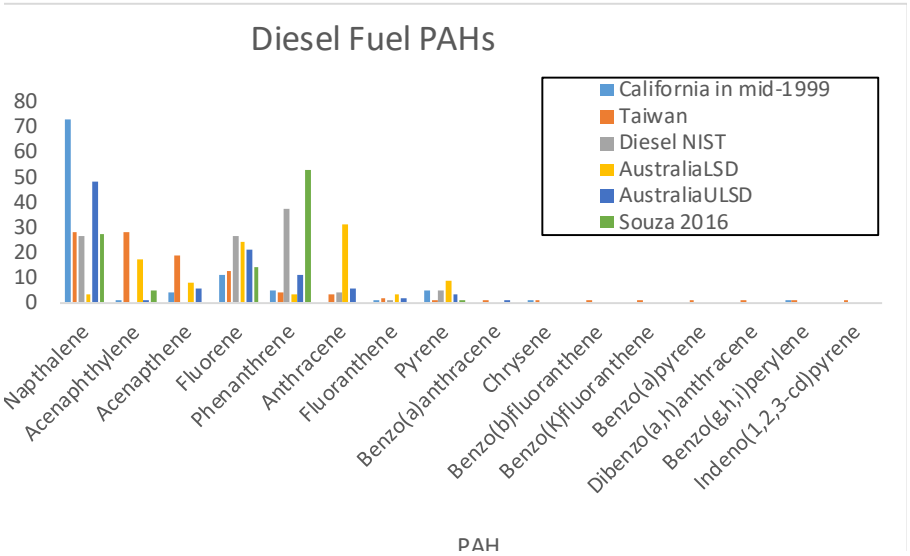


Figure 8. PAHs commonly found in diesel fuels. Note that PAH data are in percent of total. Data from de Souza *et al.* (2016), Dobbins *et al.* (2006), and Lim *et al.* (2005).

The USCG LORAN station on Cocos Island used diesel generators to power the LORAN equipment. Empty, above-ground storage tanks (AST) were found on Cocos Island by USCG contractors and subsequently removed, beginning in 2005. Environet (2005), contracted by the USCG to assess chemical contaminants on Cocos Island, detected PAHs in roughly 14 percent of the soil samples on the island in the area of the former LORAN station, with concentrations reported as high as 29.96 mg/kg (29,960 ng/g), using an immunoassay field kit. In nearshore sediments, results using the immunoassay field kits indicated PAHs were above the detection limit in approximately 20 percent of the samples. However, follow up laboratory analysis to verify the concentrations, failed to detect the presence of PAHs in the sediment samples. In the current work, PAHs were detected on all the PEDs.

The PAHs typically found in diesel fuel, can be used to compare the PAHs found on the PEDs, to assess whether PAHs from the former LORAN station could be a source of some of the dissolved PAHs accumulated by the PEDs deployed around Cocos Island. Figure 8 shows some of the PAH components of diesel fuel from various sources. It can be seen that diesel fuel, in terms of PAHs, tends to contain the lower molecular weight PAHs. In their research, de Souza *et al*. (2016) noted that PAHs with a molecular weight greater than pyrene are typically not found in diesel fuels, or are at very low concentrations relative to other PAHs present. This also can be seen in Figure 8, where PAHs larger than pyrene are typically absent or at very low concentrations in diesel fuel. Figure 9 provides a breakdown of these same PAHs found on the PEDs. There appear to be some similarities, including the presence of napthalene, fluorene and phenanthrene that are found in diesel fuels and were detected on the PEDs,

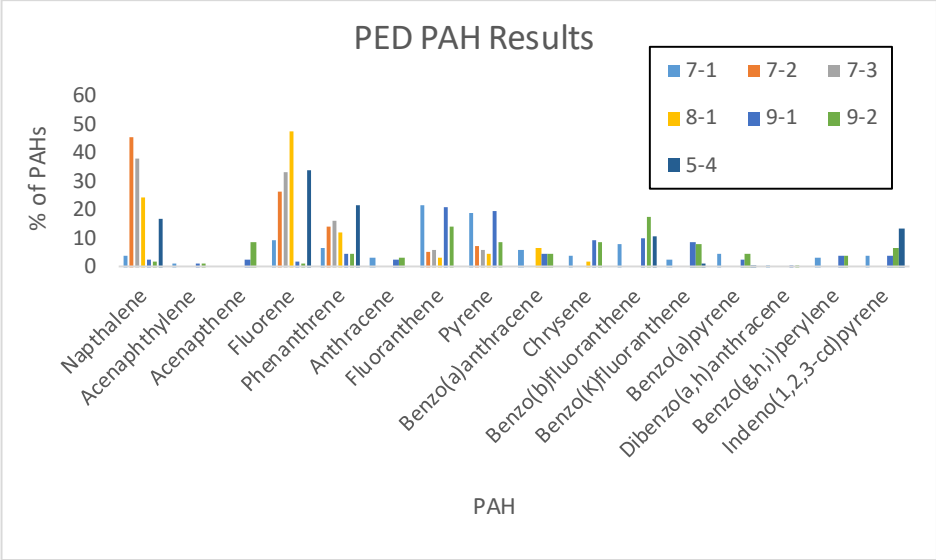


Figure 9. Total PAHs detected on the PEDs at various locations around Cocos Island, Guam. Note that PAH data are in percent of total.

however, the higher molecular weight PAHs (i.e., greater than pyrene), were found on the PEDs as well, indicating that these PAHs could be associated with the combustion of fuels like gasoline and perhaps diesel.

The ratios of phenanthrene-to-anthracene (P/A) and fluoranthene-to-pyrene (F/P) have been used as a screening tool to assess the relative contributions of pyrogenic (combustion-related) versus petrogenic (uncombusted) sources of PAHs (Budzinski *et al*., 1997). Higher levels of uncombusted PAHs would be more indicative of the presence of spilled fuels, such as gasoline, diesel, or oil. P/A ratios less than 10 are more indicative of pyrogenic sources; F/P ratios greater than 1 are also thought to be associated with pyrogenic sources. Figure 10 shows the results from sites where these four compounds were detected on the PEDs. As can be seen in Figure 10, all P/A ratios were less than 10, and the F/P ratios were close or above 1, indicating a pyrogenic contribution, even at sites 9-1 and 9-2.

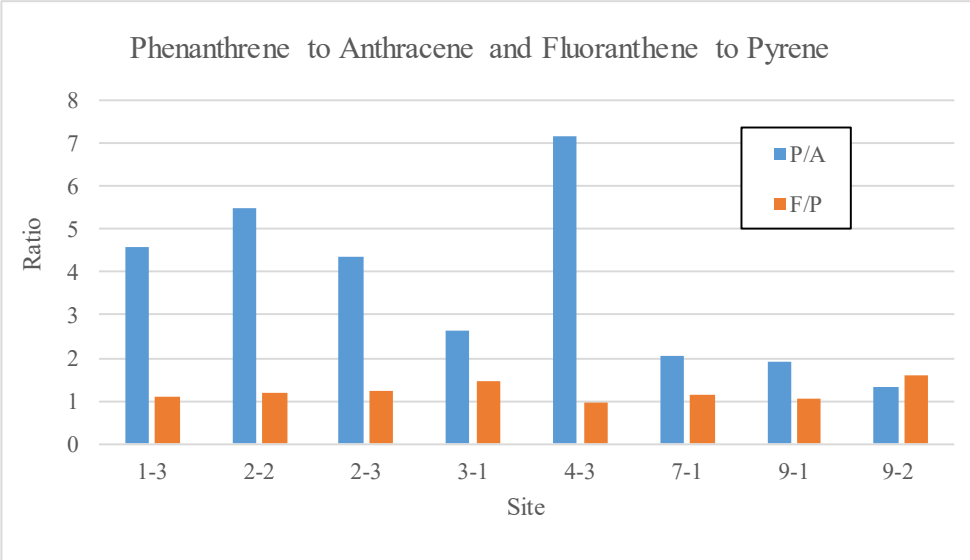


Figure 10. Ratio of phenanthrene to anthracene (P/A) and fluoranthene to pyrene (F/P) from PEDs deployed around Cocos Island, Guam.

From Figure 7 it can be seen that there were detections of total PAHs at a number of sites further out in Cocos Lagoon. For example, sites 1-3, 3-3, and 4-3, had total PAH values above 100 ng. In addition, the signature of the total PAHs present indicated a contribution of pyrogenic sources. It's possible that boat traffic in the area may also have contributed to the total PAH signature found on the PEDs at these sites. Biache *et al*. (2017) noted that biodegradation of PAHs tends to shift PAH ratios towards a pyrogenic signature, meaning that degradation of PAHs from Cocos Island could result in an originally petrogenic input looking more like a pyrogenic input as the hydrocarbons degrade. At the same time, however, if boat traffic (including exhaust from the engines) contributed to the PAHs present, it would not be surprising that there would be a pyrogenic signature.

Total DDT Detected on the PEDs

The results from the analysis of the PEDs for the organochlorine pesticide DDT and its metabolites (termed total DDT) can be seen in Figure 11. Unlike the results from the analysis of PAHs, the detections of total DDT on the PEDs all occurred at the very nearshore sites, including 9-1, 9-2, 4-1, 5-1, 6-1, and 7-1. At over 75 percent of the sites where the PEDs were deployed, however, DDT was either not detected or was below the method detection limit (Figure 11 and Appendix I). A nonparametric Wilcoxon test on nearshore versus PED sites further out in Cocos Lagoon, including sites 9-1 and 9-2 found a significant difference (ChiSquare = 9.7537, $p = 0.0076$) in total DDT moving from nearshore areas to the sites further out in Cocos Lagoon. Leaving out sites 9-1 and 9-2 still resulted in a significant (ChiSquare = 7.7725 p = 0.0205) difference. There were, however, no lateral (i.e., moving along the shore) differences (ChiSquare = 10.5695, $p = 0.2273$)

The highest concentrations of total DDT were at sites 9-1 and 9-2. The concentration of total DDT on the PEDs at 9-1 was 936 ng, the concentration at 9-2, however, was over 2,000 ng. As with the PAHs, sites 9-1 and 9-2 where the PEDs were buried in the sand adjacent to the site of the former LORAN station, the total DDT concentrations were substantially elevated. There were also somewhat elevated levels on the PEDs deployed on the northeast side of Cocos Island, in the area where it is thought that sand may have been moved, perhaps from around sites 9-1 and 9-2.

The remaining sites where total DDT were detected on the PEDs had much lower concentrations. Hartwell *et al*. (2017) detected elevated levels of total DDT in a number of fish in Cocos Lagoon, specifically around Cocos Island. Total DDT levels in some fish were above the USEPA screening values for subsistence and even recreational fishers. The USEPA guidelines were developed using average fish consumption rates for recreational and subsistence fishers. Subsistence fisher guidelines are lower (i.e., a lower acceptable concentration) than those for recreational fishers, as subsistence fishers consume fish at a higher rate

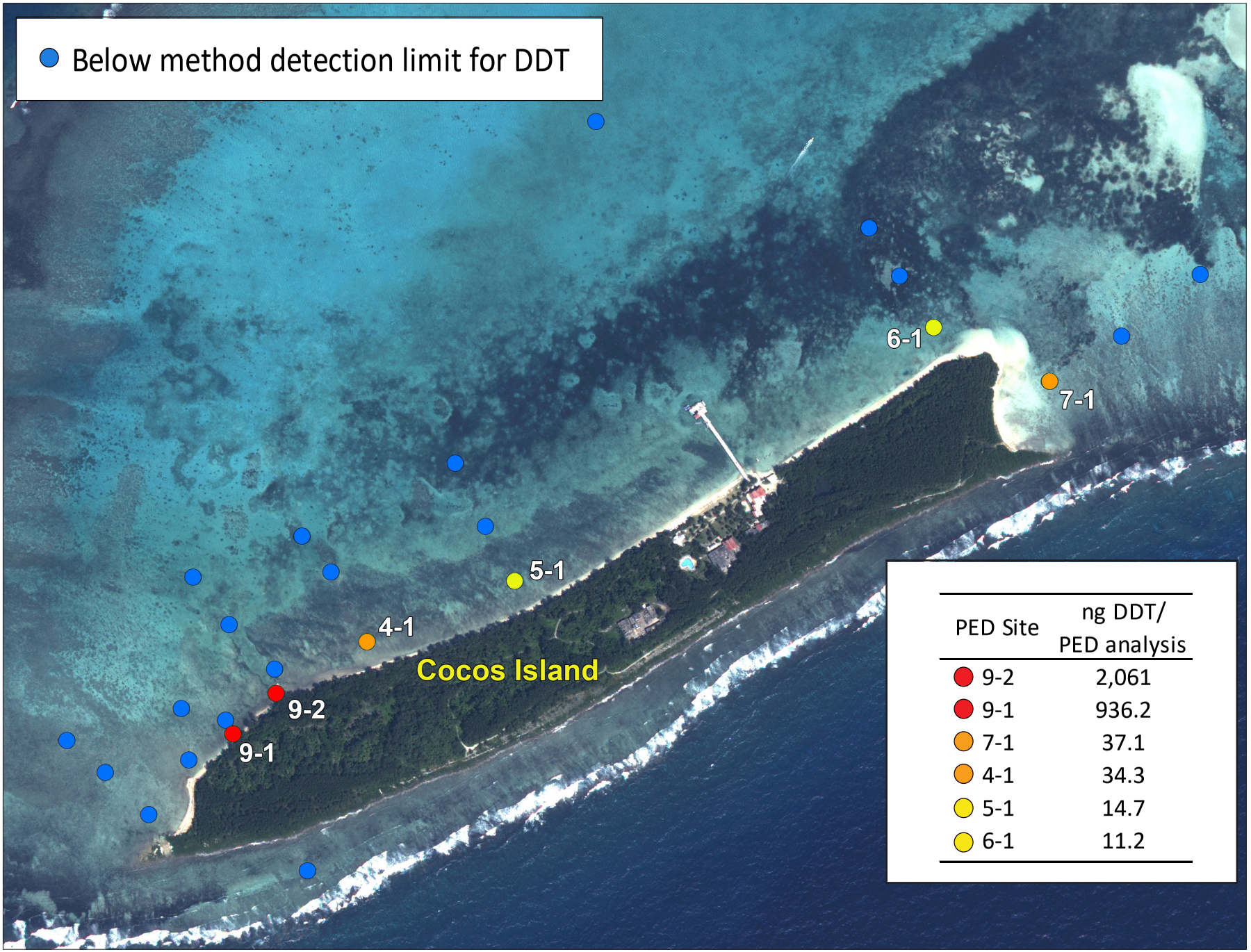


Figure 11. Concentration of total DDT found on the PEDs deployed around Cocos Island, Guam.

(i.e., they eat fish more often), and therefore would potentially accumulate higher amounts of a chemical contaminant over time.

Unlike PAHs, however, the higher concentrations of total DDT on the PEDs did not extend out into Cocos Lagoon. The next highest level found on the PEDs was 37 ng, at site 7-1 on the northeastern side of Cocos Island, possibly as a result of sand being manually transported there sometime between 2006 and 2010.

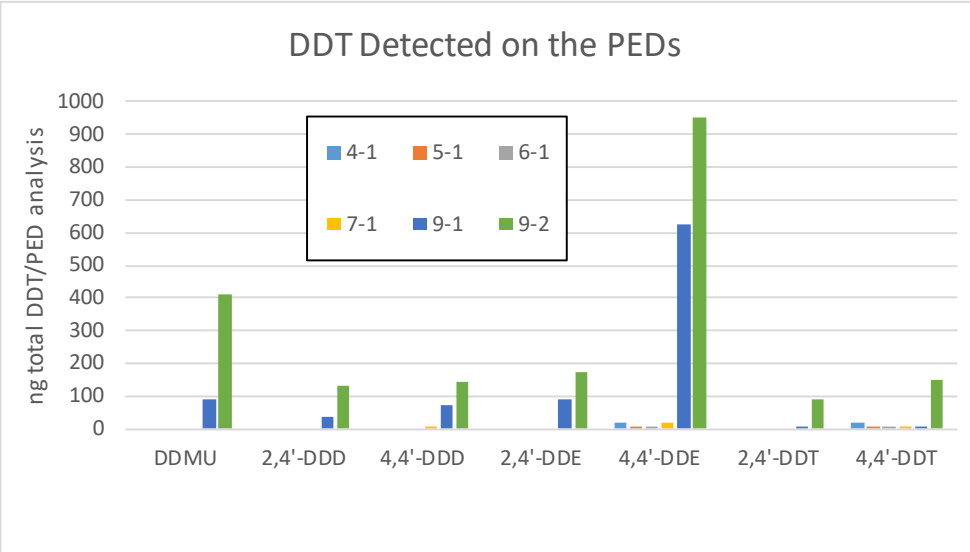


Figure 12. Parent (4,4'-DDT and 2,4-DDT) and DDT degradation products detected on the PEDs deployed around Cocos Island, Guam.

One of the goals of this project was to assess whether contaminants like DDT were present in the water column around Cocos Island, providing a means for their direct uptake in biota like fish. The results from this study indicate that possibility, although the lack of total DDT on the PEDs further out in Cocos Lagoon, could indicate that transfer through the food chain from lower to higher trophic levels including fish may also be important. The fish (banded sergeant majors (*Abudefduf septemfasciatus*) and blackspot sergeant (*Abudefduf sordidus*)) that contained the highest concentrations of total DDT (Hartwell *et al*., 2017), tended to be species that consume invertebrates (e.g., crustaceans) as well as algae.

DDT is made up of 3 isomers, including p,p'-DDT, o,p'-DDT and o,o'-DDT. The p,p'-DDT isomer accounts for about 85 percent of the original formulation, followed by o,p'-DDT (15 percent) and o,o'-DDT in trace amounts. The other compounds including DDE, DDD and DDMU are typically degradation products under aerobic or anaerobic conditions (ATSDR, 2002). By looking at the mix of parent compounds versus the degradation products, insights into the possible environmental conditions to which the DDT has been exposed to over the years can be inferred.

Figure 12 shows the parent and degradation products of DDT from the sites where total DDT was detected. From this figure, it can be seen that the degradation product DDE, was the major component of total DDT found on the PEDs. The parent compounds made up approximately 2 and 12 percent of the total DDT found on the PEDs at sites 9-1 and 9-2, respectively. In contrast, Pait *et al*. (2010) found that the parent DDT compounds comprised approximately 68 percent of the total DDT present in sediments at a site in Vieques, Puerto Rico, possibly indicating a more recent spill or a reservoir of DDT at or near the site sampled with environmental conditions (e.g., anoxic sediments) that slowed degradation.

It does not appear that total DDT had been quantified in the waters around Cocos Island, previous to the work of Hartwell *et al*. (2017). It would be interesting to assess the presence of total DDT, particularly in the soils on Cocos Island in the area of the former LORAN station, to assess whether the higher concentrations present might be mostly in the form of degradation products like DDE, or if some higher concentrations of undegraded parent compounds are present. This type of assessment might help inform environmental managers as to whether there is a discreet, perhaps localized source of DDT on the island, or if the DDT is present mostly as degradation products over a wider area around the former LORAN station site.

Other Organochlorine Pesticides

Although a series of other organochlorine pesticides were analyzed on the PEDs, including aldrin, dieldrin, heptachlor, and chlordane, none of the other pesticides analyzed were detected (Apendix I).

Total PCBs Detected on the PEDs

The results of the analysis of PCBs on the PEDs can be seen in Figure 13. As noted earlier, PRCs, or performance reference compounds, were added to the PEDs prior to their shipment to Guam. The PRCs are used to model how close the deployed PED is to equilibrium. Appendix K contains total PCB values with and without the PRCs. For assessing the concentration of PCB accumulated by the PEDs during

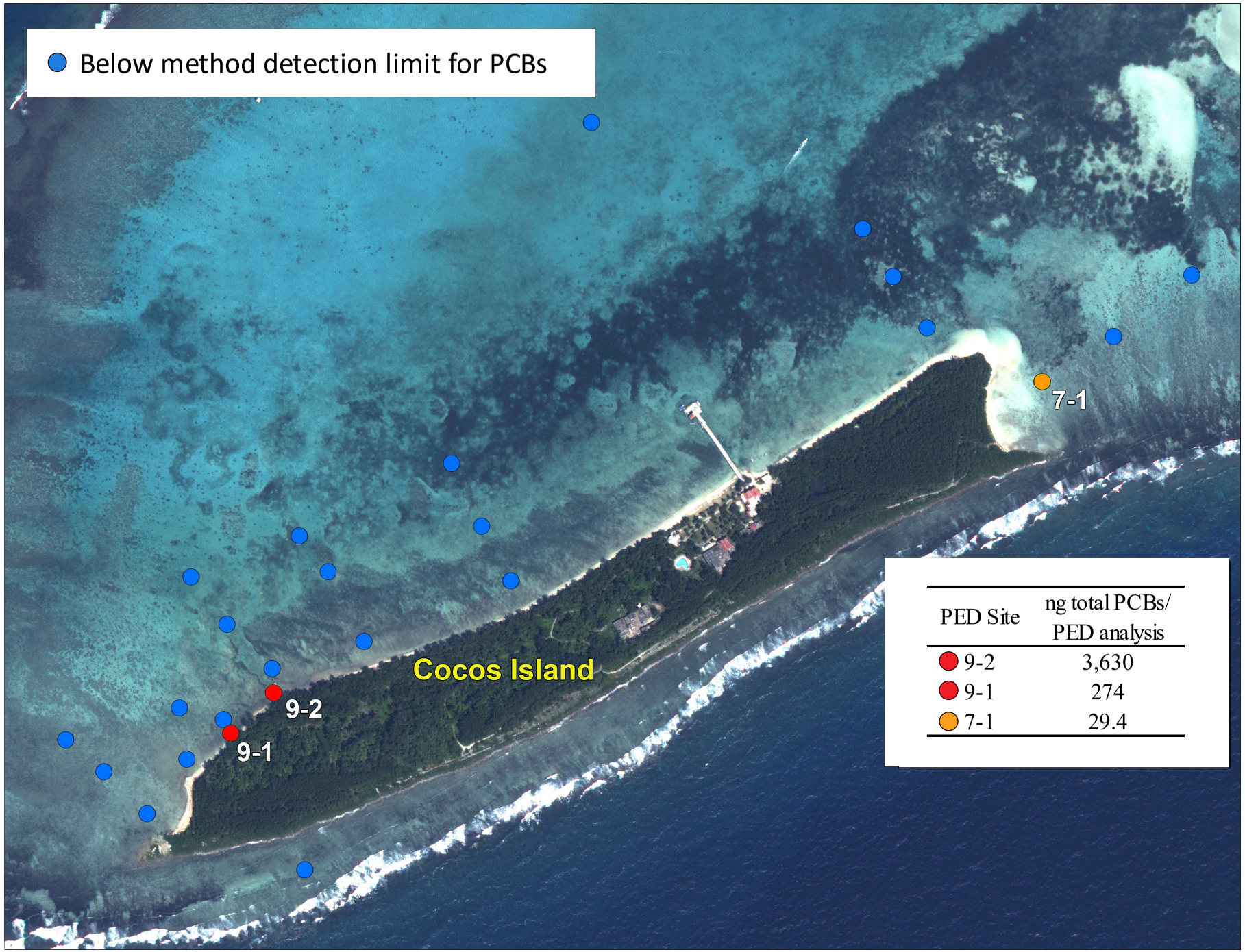


Figure 13. Concentration of PCBs found on the PEDs deployed around Cocos Island, Guam.

deployment, the totals without the PRCs were plotted in Figure 13.

It can be seen in Figure 13 that only the PEDs deployed at sites 7-1, 9-1, and 9-2 had detectable levels of total PCBs. The highest concentration of total PCBs, as was found for total PAHs and for total DDT, was at site 9-2. The concentration was over 3,600 ng/PED analysis. The next highest concentration was at the adjacent 9-1 site (274 ng). A nonparametric Wilcoxon test on nearshore versus PED sites further out in Cocos Lagoon, failed to detect a significant difference (ChiSquare = 1.96702, $p = 0.3740$) in total PCBs moving from nearshore areas to the sites further out in Cocos Lagoon.

While Hartwell *et al*. (2017) found total PCB concentrations of less than 1 ng/g in the sediments in this same nearshore area, the fish in the area adjacent to 9-1 and 9-2 contained total PCB concentrations as high as 303 ng/g. A USCG contractor found concentrations of total PCBs as high as 1 X 10^6 ng/g or 1,080 µg/g in the soils on Cocos Island (Environet, 2005).

In 2007, approximately 380 cubic yards of PCB-contaminated soil were removed and disposed of from the site of the former LORAN station (Element Environmental, 2014). In 2008, Element Environmental conducted a follow-up assessment on Cocos Island, and did not detect PCBs in the soil above the detection level (Element Environmental, 2008).

As mentioned above, an important goal of this project was to assess whether contaminants like total PCBs along with total DDT dissolved in the water column around Cocos Island, could provide a means for their direct uptake in biota like fish. However, there did not appear to be a gradient in total PCBs on the PEDs arrayed from nearshore to further out in Cocos Lagoon. Total PCBs were only detected on the two PEDs embedded in the sand near the former LORAN station, and also on the PED deployed on the northeast end of the island. It may be that the uptake of total PCBs in fish found by Hartwell *et al*. (2017) occurs from dissolved concentrations in the very nearshore waters near the former LORAN site, but that uptake through the food chain or from sediment porewater is important as well.

SUMMARY AND CONCLUSIONS

Between 1944 and 1963, the USCG operated a LORAN navigation station on Cocos Island. It is thought that the disposal of materials from the station resulted in the contamination of soils on the island near the former LORAN site, as well as in adjacent waters. The levels of chemical contamination on the island and in nearshore waters around the former LORAN station have been characterized by USCG contractors. The levels of contamination, particularly in fish, is of concern to the local population and to environmental managers. In 2006, a fish consumption advisory was put in place for all of Cocos Lagoon, and remains in place.

In 2015, NCCOS worked closely with local partners to characterize chemical contaminants in sediments and fish throughout Cocos Lagoon. Elevated and in some cases highly elevated levels of total PCBs and total DDT were found in fish, particularly in fish collected in the waters adjacent to the former LORAN station (Hartwell *et al*., 2017). Although sediments typically serve as a reservoir for chemical contaminants that can accumulate in aquatic organisms, the sediments collected from around Cocos Island contained only low levels of chemical contaminants. Because of this, it was thought that the sediments might not be the only source or medium through which contaminants were accumulating in the fish. One possibility was that PCBs or DDT transported in dissolved form via water from Cocos Island (e.g., through surface water runoff or groundwater) were being taken up directly by the fish.

To assess the possibility that chemical contaminants were in the water column around Cocos Island, this project was implemented by NOAA/NCCOS along with Guam EPA, USEPA and the USCG. Project partners deployed polyethylene device (PED) passive water samplers, in an array out from Cocos Island. Passive water samplers like PEDs provide important information on dissolved concentrations of a compound in the environment. It is thought that dissolved concentrations of chemical contaminants are the most bioavailable.

The results indicated that PAHs were in a number of the PEDs deployed around Cocos Island, both near the shore and further out in the array. Given the mixture of PAHs found on the PEDs, particularly those further out in the array in Cocos Lagoon, it is possible that boat traffic (e.g., engine exhaust) in the area may also have contributed to the total PAH signature present.

The distribution of total DDT and in particular, total PCBs on the PEDs found in this study was limited spatially. Total DDT was only detected at a few very nearshore areas. Total PCBs were even more spatially limited. Only three PED sites had total PCB detections. Two of these, however, were on the PEDs buried in the sand near the former LORAN station. These PEDs were not suspended in the water column as were most of the others.

The fish analyzed by Hartwell *et al.* (2017) found to have elevated levels of total DDT and total PCBs, were collected near the former LORAN station site and feed on invertebrates and algae in nearshore waters. In addition to any direct accumulation of these contaminants from the water column, accumulation through the food chain may also be important. The sites where the PEDs were embedded in the sand showed high concentrations of total DDT and total PCBs. If these contaminants are making their way in subsurface or groundwater from a source on the island into nearshore waters, then organisms such as invertebrates living in the sand could accumulate these contaminants and pass them on to higher trophic level organisms such as fish. In addition, fish feeding in nearshore areas could also ingest sediment with contaminants on the sediment particles or in the sediment porewater. It may be that the uptake of the contaminants seen in the fish around Cocos Island is a combination of all three mechanisms, that is accumulation of dissolved contaminants from the water column, through the food chain, and also as a result of contact with sediments. It would be interesting to follow up on the work done to date, with an assessment of contaminants in algae and invertebrates that higher trophic level organisms such as fish may feed on.

From the current work and the recent investigation by Hartwell *et al*. (2017), it appears that contaminants like DDT and PCBs are still present in the nearshore waters around Cocos Island, including fish. In 2007, approximately 380 cubic yards of soil were removed from the island. Additional work to try an pinpoint where the remaining contaminants are coming from may be useful. One possibility that has been discussed among project partners is the installation of piezometers (i.e., shallow wells) around the former location of the LORAN station, followed by installation of PEDs, to assess if the contaminants may be concentrated in one part of the former site. It may also be useful to place piezometers, perhaps in an array towards the water, to see if a gradient of dissolved concentrations of contaminants is present, and if so, if the higher concentrations are limited to a particular area that may be related to past land use activities or groundwater/subsurface flow, or if it is more diffuse, covering a larger area. This type of information would be important to resource managers in deciding how to follow up with any restoration activities such as the removal of additional soil from the island, to ultimately reduce the amount of contaminants like PCBs and DDT going into Cocos Lagoon.

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Appendix A. Deployment data for the polyethylene devices (PEDs) around Cocos Island.

Site	Date Deployed	Time	Latitude (DD)	Longitude (DD)	Depth (ft)	Depth (m)	PED Frame 1 Tag (Brass Tag)	PED Frame 2 Tag (Brass Tag)	Notes	Animals/Plants Present
1-1	9/19/2017	10:48 AM	13.23485	144.64442	2.5	0.8	170217 HS013 (057)	170217 FS021 (058)	Fine brown sand	Starfish and sea cucumber
1-2	9/19/2017	12:43 PM	13.23550	144.64372	2.5	0.8	170217 HS016 (056)	170217 HS015 (025)	Brown sand, shell and rock	Algae
1-3	9/19/2017	12:58 PM	13.23600	144.64310	3.0	0.9	170217 JS006 (055)	170217 HS011 (022)	Brown sand and rock	Coral
2-1	9/19/2017	11:26 AM	13.23571	144.64505	1.5	0.5	170217 HS010 (018)	170217 FS013	Brown/tan sand, shell and rock	Algae
2-2	9/19/2017	11:41 AM	13.23634	144.64563	2.0	0.6	170217 JS018 (019)	170217 JS014 (020)	Shell/rock	Algae
2-3	9/19/2017	12:14 PM	13.23652	144.64492	3.0	0.9	170217 FS010 (021)	170217 FS009 (023)	Brown sand, shell and rock	Algae
3-1	9/20/2017	12:29 PM	13.23715	144.64640	1.0	0.3	170217 JS005 (005)	170217 FS006 (904)	Light brown and gray sand	Sea cucumbers *(Actinopyga achinites* and *Holothuria atra*), SAV (*Halodule sp.* and *Halophila sp.*), and algae (*Halimeda opuntia*)
3-2	9/20/2017	12:12 PM	13.23784	144.64567	3.0	0.9	170217 JS011 (004)	170217 JS004 (906)	Light brown and gray sand	SAV (*Halodule sp. and Halophila sp.*) and algae (*Halimeda sp.*)
3-3	9/20/2017	12:39 PM	13.23858	144.64509	7.0	2.1	170217 FS008 (907)	170217 JS019 (017)		
4-1	9/19/2017	1:57 PM	13.23759	144.64787	1.5	0.5	170217 FS015 (016)	170217 FS014 (015)	Brown/tan rock	Algae
4-2	9/20/2017	11:50 AM	13.23868	144.64729	3.0	0.9	170217 FS011 (013)	170217 JS017 (907)	Gray and light brown sand	Algae (*Sargassum sp., Padina sp., Caulerpa sp., Chaetomorhpha sp.*) and SAV (*Halodule sp.*)
4-3	9/20/2017	1:06 PM	13.23924	144.64682	5.0	1.5	170217 LS003 (011)	–	Only one frame deployed	
4-3	9/20/2017	2:02 PM	13.23924	144.64682	–	–	170217 LS008 (035)	170217 JS021 (034)	035 buried in sand; 034 in water column	
5-1	9/20/2017	1:07 PM	13.23857	144.65022	2.0	0.6	170217 JS008 (001)	170217 JS009 (905)		Algae (*Paolina sp., Dictyota sp., Caulerpa racemosa, Caulerpa sp., Neomeris sp.)*
5-2	9/20/2017	11:22 AM	13.23942	144.64974	4.5	1.4	170217 HS014 (014)	170217 FS016 (908)		SAV *(Halodule sp.)* Algae *(Caulerpa sp., Halimeda sp.)*
5-3	9/20/2017	–	13.24041	144.64925	–	–	170217 LS006 (010)	170217 JS016 (033)		
5-4	9/20/2017	12:10 PM	13.24579	144.65144	8.0	2.4	170217 FS003 (913)	170217 FS007 (007)	Buoy marker may have drifted during installation	
6-1	9/22/2017	12:55 PM	13.24261	144.65686	–	–	170217 JS022 (029)	170217 LS010 (030)	Pavement, about 1 foot under sand	SAV (*Halodule sp.* and *Halophila sp.*) Algae (*Halimeda avrainvillea*)
6-2	9/22/2017	1:18 PM	13.24341	144.65631	–	–	170217 LS011 (032)	170217 FS012 (031)		Sea cucumber (*Holothuria atra*) SAV (*Halodule sp.* and *Halophila sp.*), Algae (*Sargassum sp., Padina sp., Caulerpa sp.*)
6-3	9/20/2019	1:26 PM	13.24416	144.65581	2.0	0.6	170217 JS010 (008)	170217 LS012 (912)	Gray and light brown sand	Sea cucumber (*Actinopyga achinites*), SAV (*Halodule sp* .), Algae (*Halimeda avrainvillea* , *Dictyota sp* .)
7-1	9/22/2019	10:40 AM	13.24178	144.65871	1.0	0.3	170217 LS007 (003)	170217 LS005 (006)	Sand, shell/rock, hardpan (~6 inches down)	Sea cucumber (*Holothuria atra*), Algae (*Caulerpa sp., Padina sp., Chaetomorpha sp.*)
7-2	9/22/2017	11:57 AM	13.24250	144.65985	3.5	1.1	170217 LS004 (012)	170217 JS013 (026)	Sand, coral, rubble, pavement 6-8 inches under sand	Coral (*Porites sp* .) Algae (*Padina sp., Dictyota sp., Sargassam sp., Chaetomorpha sp* .)
7-3	9/22/2017	12:24 PM	13.24348	144.66110	5.0	1.5	170217 JS017 (027)	170217 HS018 (028)	Sand, pavement 1.5 feet under sand	Coral (*Porites rus, Porites cylindrica, Sinularia sp.*) Algae (*Dictyota sp., Chaetomorpha sp* .)
8-1	9/18/2017	1:27 PM	13.23399	144.64696	3.0	0.9	170217 FS019 (060)	170217 FS020 (059)	Sand, shell/rock, hardpan; Drilled for rebar placement; PEDs parallel, perpendicular to current, to each other	Sea cucumber (*Holothuria atra*), Algae (*Sargassam sp., Chaetomorpha sp* .)
8-2	9/22/2017	11:11 AM	??	??	5.0	1.5	170217 JS012 (002)	170217 LS009 (009)	Hard pan	Sea cucumber (*Holothuria atra*), Algae (*Chaetomorpha sp., Padina sp., Sargassam sp. Caulerpa sp., Halimeda sp.*)
9-1	9/18/2017	12:31 PM	13.23613	144.64575	Buried	Buried	170217 FS022 (052)	170217 FS018 (053)	PEDs buried in gray sand with shell/rock; Frame 1 wa 4 inches above sediment, Frame 2 was 4.5 to 5 inches above sediment; metallic debirs (part of old transformer?) photo taken along with GPS reading; PEDs placed below high	Sea cucumber (*Holothuria atra*), SAV (*Halodule sp* .) and algae (*Chaetomorpha sp., Neomeris sp., Padina sp., Halimeda sp* .)
9-2	9/18/2017	11:57AM	13.23677	144.64643	Buried	Buried	170217 HS007 (054)	170217 HS009 (051)	Brown/gray sand, shell/rock; PEDs installed three feet below high water mark, and perpendicular to shore; half buried/half exposed in water; metallic debris around installation site	Algae (*Chaetomorpha sp* .) along the shore

Notes: DD; decimal degrees; m, meters.

Appendix B. Deployment data for the polyethylene device (PED) field blanks.

Sample ID	Date Retrieved	Time Retrieved	PED Frame Tag (Brass Tag)
Blank #1	9/18/2017	1:00PM	170217 HS012
Blank #2	9/18/2017	2:01PM	170217 HS017
Blank #3	9/19/2017	1:28PM	170217 FS017
Blank #4	9/19/2017	2:02PM	170217 JS003
Blank #5	9/20/2017	1:28PM	170217 JS020
Blank #6	9/20/2017	1:30PM	170217 FS004
Blank #7	9/22/2017	12:43PM	170217 JS007
Blank #8	9/22/2017	1:23PM	170217 FS005

Appendix C. Retrieval data for the PEDs.

Sample ID	Date Install	Status Install	Date Retrieved	Time Retrieved	Frame #	Notes
1-1 #057	9/19/2017	water column	10/27/2017	1219	170217 HS013	
1-1 #058	9/19/2017	water column	10/27/2017	1220	170217 FS021	
1-2 #056	9/19/2017	water column	10/27/2017	1207	170217 HS016	
1-2 #025	9/19/2017	water column	10/27/2017	1206	170217 HS015	
1-3 #055	9/19/2017	water column	10/30/2017	1401	170217 JS006	
1-3 #022	9/19/2017	water column	10/30/2017	1401	170217 HS011	
2-1 #018	9/19/2017	water column	10/30/2017	1433	170217 HS010	
2-1 #024	9/19/2017	water column	10/30/2017	1433	170217 FS013	
2-2 #019	9/19/2017	water column	10/30/2017	1424	170217 JS018	
2-2 #020	9/19/2017	water column	10/30/2017	1424	170217 JS014	
2-3 #021	9/19/2017	water column	10/30/2017	1415	170217 FS010	
2-3 #023	9/19/2017	water column	10/30/2017	1415	170217 FS009	
3-1 #005	9/20/2017	water column	10/27/2017	1032	170217 JS005	
3-1 #904	9/20/2017	water column	10/27/2017	1034	170217 FS006	
3-2 #004	9/20/2017	water column	10/30/2017	1442	170217 JS011	
3-2 #906	9/20/2017	water column	10/30/2017	1442	170217 JS004	
3-3 #909	9/20/2017	water column	10/30/2017	1451	170217 FS008	
3-3 #017	9/20/2017	water column	10/30/2017	1451	170217 JS019	
4-1 #016	9/19/2017	water column	10/30/2017	1346	170217 FS015	
4-1 #015	9/19/2017	water column	10/30/2017	1346	170217 FS014	
4-2 #013	9/20/2017	water column	10/30/2017	1332	170217 FS011	
4-2 #907	9/20/2017	water column	10/30/2017	1332	170217 JS015	#907 glass jar cracked during transit. Jar replaced at GEPA Lab.
4-3 #011	9/20/2017	water column	10/30/2017	1312	170217 LS003	
4-3 #035	9/22/2017	buried	10/30/2017	1312	170217 LS008	
4-3 #034	9/22/2017	water column	10/30/2017	1312	170217 JS021	
5-1 #001	9/20/2017	water column	10/30/2017	1302	170217 JS008	
5-1 #905	9/20/2017	water column	10/30/2017	1302	170217 JS009	
5-2 #014	9/20/2017	water column	10/30/2017	1253	170217 HS014	
5-2 #908	9/20/2017	water column	10/30/2017	1253	170217 FS016	
5-3 #010	9/20/2017	water column	10/30/2017	1245	170217 LS006	no in-situ photo of retrieval
5-3 #033	9/22/2017	water column	10/30/2017	1244	170217 JS016	no in-situ photo of retrieval
5-4 #913	9/20/2017	water column	10/30/2017	1224	170217 FS003	
5-4 #007	9/20/2017	water column	10/30/2017	1225	170217 FS007	
6-1 #029	9/22/2017	water column	10/30/2017	1145	170217 JS022	
6-1 #030	9/22/2017	water column	10/30/2017	1146	170217 LS010	
6-2 #032	9/22/2017	water column	10/30/2017	1157	170217 LS011	
6-2 #031	9/22/2017	water column	10/30/2017	1156	170217 FS012	
6-3 #008	9/20/2017	water column	10/30/2017	1210	170217 JS010	
6-3 #912	9/20/2017	water column	10/30/2017	1211	170217 LS012	
7-1 #003	9/22/2017	water column	10/27/2017	1308	170217 LS007	at retrieval buried in sand
7-1 #006	9/22/2017	water column	10/27/2017	1308	170217 LS005	at retrieval buried in sand
7-2 #012	9/22/2017	water column	10/27/2017	1242	170217 LS004	
7-2 #026	9/22/2017	water column	10/27/2017	1242	170217 JS013	
7-3 #027	9/22/2017	water column	10/27/2017	1357	170217 JS017	
7-3 #028	9/22/2017	water column	10/27/2017	1357	170217 HS018	
8-1 #060	9/18/2017	water column	10/27/2017	1134	170217 FS019	
8-1 #059	9/18/2017	water column	10/27/2017	1132	170217 FS020	
8-2 #002	9/22/2017	water column			170217 FS012	PED not found on 10/27/17 and 10/30/17
8-2 #009	9/22/2017	water column			170217 LS009	PED not found on 10/27/17 and 10/30/17
9-1 #052	9/18/2017	buried	10/27/2017	1058	170217 FS022	
9-1 #053	9/18/2017	buried	10/27/2017	1059	170217 FS018	
9-2 #054	9/18/2017	buried	10/27/2017	1018	170217 HS007	PED not standing up
9-2 #051	9/18/2017	buried	10/27/2017	1019	170217 HS009	PED not standing up
BLANK-1	NA	NA	9/18/2017	1300	170217 HS012	
BLANK 2	NA	NA	9/18/2017	1401	170217 HS017	
BLANK 3	NA	NA	9/19/2017	1328	170217 FS017	
BLANK 4	NA	NA	9/19/2017	1402	170217 JS003	
BLANK-5	NA	NA	9/20/2017	1328	170217 JS020	
BLANK 6	NA	NA	9/20/2017	1330	170217 FS004	
BLANK 7	NA	NA	9/22/2017	1243	170217 JS007	
BLANK 8	NA	NA	9/22/2017	1323	170217 FS005	

Appendix D. Surface area measurements for the PEDs.

Sample ID	Total Area of composite cm^2	Total Area front & back cm^2
Blank 1	444.0	888.0
Blank 2	396.0	792.0
Blank 3	414.0	828.0
Blank 4	396.0	792.0
Blank 5	407.0	814.0
Blank 6	432.0	864.0
Blank 7	407.0	814.0
Blank 8	407.0	814.0
1-1	814.0	1628.0
1-2	828.0	1656.0
1-3	852.0	1704.0
2-1	828.0	1656.0
2-2	779.3	1558.5
2-3	838.0	1676.0
3-1	833.5	1667.0
3-2	803.0	1606.0
3-3	803.0	1606.0
4-1	786.0	1572.0
4-2	720.0	1440.0
4-3	792.0	1584.0
4-3 #035	378.0	756.0
5-1	840.0	1680.0
5-2	840.0	1680.0
5-3	797.5	1595.0
5-4	840.0	1680.0
6-1	803.0	1606.0
6-2	819.5	1639.0
6-3	845.3	1690.5
7-1	839.0	1678.0
7-2	822.0	1644.0
7-3	792.0	1584.0
8-1	777.0	1554.0
9-1	738.0	1476.0
9-2	912.0	1824.0

Appendix E. PAHs detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis).

	Sites													
Compound	1-1	Q	1-2	Q	1-3	Q	2-1	Q	2-2	Q	2-3	Q	3-1	Q
cis/trans Decalin	46.2		38.5		42.7		44.5		53.0		45.4		39.0	
C1-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Naphthalene	1.9	J	1.8	J	1.4	J	1.3	J	2.1	J	3.7	J	1.8	J
C1-Naphthalenes	0.8	J	0.5	J	0.9	J	0.9	J	1.0	J	1.0	J	0.9	J
C2-Naphthalenes	<40.1	U	<40.1	U	42.5		26.7	J	57.5		34.4		26.0	J
C3-Naphthalenes	<40.1	U	<40.1	U	37.5		<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Naphthalenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Benzothiophene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C1-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Biphenyl	1.9	J	1.8	J	3.1	J	4.0	J	2.3	J	2.5	J	2.9	J
Acenaphthylene	0.4	J	<20	U	0.2	J	0.3	J	<20	U	<20	U	<20	U
Acenaphthene	<20.1	U	<20.1	U	38.8		<20.1	U	<20.1	U	<20.1	U	<20.1	U
Dibenzofuran	0.5	J	0.6	J	0.4	J	0.6	J	0.5	J	0.5	J	0.5	J
Fluorene	3.2	J	2.7	J	2.7	J	4.7	J	2.9	J	1.8	J	3.4	J
C1-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Carbazole	30.7		7.1	J	5.8	J	5.1	J	11.3	J	8.1	J	69.5	
Anthracene	0.1	J	<20	U	0.2	J	0.1	J	0.1	J	0.6	J	0.4	J
Phenanthrene	0.9	J	0.8	J	0.8	J	0.9	J	0.8	J	2.8	J	1.1	J
C1-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Dibenzothiophene	<20	U	<20	U	<20	U	<20	U	<20	U	0.2	J	<20	U
C1-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Fluoranthene	0.6	J	0.4	J	0.4	J	0.3	J	0.5	J	13.4	J	1.2	J
Pyrene	0.6	J	0.4	J	0.4	J	0.3	J	0.4	J	11.0	J	0.8	J
C1-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	3.6	J	<40.1	U
C2-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Naphthobenzothiophene	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U
C1-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C2-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C3-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C4-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
Benz(a)anthracene	1.0	J	0.5	J	<20	U	<20	U	<20	U	5.6	J	1.0	J
Chrysene/Triphenylene	0.4	J	0.1	J	<20	U	<20	U	<20	U	3.6	J	0.8	J
C1-Chrysenes	1.3	J	<40	U	<40	U	<40	U	<40	U	1.8	J	1.1	J
C2-Chrysenes	2.2	J	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U
C3-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U
C4-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U
Benzo(b)fluoranthene	1.0	J	0.7	J	0.4	J	0.9	J	1.3	J	9.1	J	4.4	J
Benzo(k,j)fluoranthene	0.4	J	0.2	J	0.2	J	0.2	J	0.3	J	4.2	J	2.1	J
Benzo(a)fluoranthene	0.7	J	1.1	J	0.5	J	1.2	J	1.0	J	0.6	J	0.7	J
Benzo(e)pyrene	0.5	J	0.2	J	0.2	J	<20	U	0.2	J	4.3	J	0.4	J
Benzo(a)pyrene	0.4	J	0.2	J	0.1	J	<20	U	0.1	J	6.1	J	0.5	J
Perylene	<20	U	<20	U	<20	U	<20	U	<20	U	1.9	J	<20	U
Indeno(1,2,3-c,d)pyrene	0.7	J	0.7	J	0.5	J	<20	U	0.5	J	4.8	J	1.2	J
Dibenzo(a,h)anthracene	<20	U	0.3	J	0.2	J	<20	U	<20	U	<20	U	<20	U
Benzo(g,h,i)perylene	<20	U	0.4	J	<20	U	<20	U	<20	U	5.0	J	<20	U
Total PAHs	96.4		59.1		179.7		92.2		135.8		175.9		159.8	

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix E. PAHs detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Sites																			
Compound	3-2	Q	3-3	Q	4-1	Q	4-2	Q	4-3	Q	4-3 #035	Q	5-1	Q						
cis/trans Decalin	47.1		73.5		37.2		44.0		76.8		<20	U	44.3							
C1-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C2-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C3-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C4-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
Naphthalene	2.3	J	1.8	J	2.3	J	3.4	J	1.9	J	0.8	J	1.0	J						
C1-Naphthalenes	1.0	J	1.1	J	1.1	J	1.8	J	1.7	J	1.8	J	0.8	J						
C2-Naphthalenes	22.5	J	25.2	J	5.6	J	28.3	J	18.9	J	<40.1	U	4.0	J						
C3-Naphthalenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C4-Naphthalenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
Benzothiophene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U						
C1-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C2-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C3-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C4-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
Biphenyl	2.7	J	2.6	J	2.0	J	2.4	J	9.5	J	3.8	J	1.5	J						
Acenaphthylene	<20	U	<20	U	0.3	J	0.3	J	<20	U	0.4	J	<20	U						
Acenaphthene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U						
Dibenzofuran	0.5	J	0.6	J	0.6	J	0.5	J	0.9	J	<20	U	0.4	J						
Fluorene	<20	U	1.6	J	1.8	J	1.9	J	6.0	J	1.4	J	1.0	J						
C1-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C2-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C3-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
Carbazole	12.6	J	3.4	J	24.7		7.2	J	64.8		3.1	J	10.4	J						
Anthracene	0.1	J	<20	U	0.2	J	0.5	J	0.3	J	<20	U	<20	U						
Phenanthrene	0.9	J	1.2	J	1.6	J	1.1	J	2.0	J	1.7	J	0.8	J						
C1-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C2-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C3-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C4-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
Dibenzothiophene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U						
C1-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C2-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C3-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C4-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
Fluoranthene	0.5	J	0.9	J	2.5	J	0.8	J	0.8	J	2.6	J	0.8	J						
Pyrene	0.4	J	0.8	J	2.1	J	0.5	J	0.8	J	4.2	J	0.6	J						
C1-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C2-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C3-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
C4-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U						
Naphthobenzothiophene	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U						
C1-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U						
C2-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U						
C3-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U						
C4-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U						
Benz(a)anthracene	<20	U	0.7	J	1.5	J	0.6	J	<20	U	1.8	J	<20	U						
Chrysene/Triphenylene	<20	U	0.3	J	1.2	J	0.2	J	<20	U	2.1	J	<20	U						
C1-Chrysenes	<40	U	<40	U	1.2	J	<40	U	<40	U	<40	U	<40	U						
C2-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U						
C3-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U						
C4-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U						
Benzo(b)fluoranthene	0.9	J	1.1	J	2.8	J	0.8	J	1.6	J	4.1	J	0.9	J						
Benzo(k,j)fluoranthene	0.2	J	0.3	J	0.9	J	0.2	J	0.3	J	2.2	J	0.2	J						
Benzo(a)fluoranthene	0.8	J	2.6	J	0.6	J	1.1	J	0.8	J	1.3	J	<20	U						
Benzo(e)pyrene	0.2	J	0.2	J	1.0	J	0.1	J	0.3	J	1.9	J	0.2	J						
Benzo(a)pyrene	0.2	J	0.1	J	1.2	J	0.1	J	0.3	J	1.1	J	0.1	J						
Perylene	<20	U	0.1	J	0.3	J	0.2	J	0.8	J	0.7	J	<20	U						
Indeno(1,2,3-c,d)pyrene	0.6	J	0.8	J	1.3	J	0.6	J	2.0	J	2.0	J	0.5	J						
Dibenzo(a,h)anthracene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U						
Benzo(g,h,i)perylene	<20	U	<20	U	1.1	J	<20	U	0.5	J	1.6	J	0.4	J						
Total PAHs	93.6		118.9		95.0		96.8		191.0		38.4		68.2							

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix E. PAHs detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Sites													
Compound	5-2	Q	5-3	Q	5-4	Q	6-1	Q	6-2	Q	6-3	Q	7-1	Q
cis/trans Decalin	43.7		47.0		64.6		50.7		39.9		54.9		92.8	
C1-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Naphthalene	1.6	J	1.8	J	1.5	J	0.9	J	2.4	J	2.4	J	4.6	J
C1-Naphthalenes	1.1	J	1.1	J	<40.1	U	0.8	J	1.0	J	1.4	J	2.4	J
C2-Naphthalenes	12.5	J	17.0	J	26.6	J	7.6	J	5.7	J	6.0	J	22.6	J
C3-Naphthalenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Naphthalenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Benzothiophene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C1-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Biphenyl	4.5	J	1.9	J	7.8	J	1.5	J	1.2	J	4.9	J	8.7	J
Acenaphthylene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	1.7	J
Acenaphthene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
Dibenzofuran	0.5	J	0.5	J	0.7	J	0.5	J	0.4	J	0.6	J	1.6	J
Fluorene	1.7	J	1.2	J	3.0	J	1.5	J	0.6	J	3.1	J	11.0	J
C1-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	8.6	J
C2-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Carbazole	11.4	J	31.3		20.2		13.2	J	5.6	J	5.7	J	3.5	J
Anthracene	0.1	J	<20	U	<20	U	<20	U	<20	U	0.2	J	3.6	J
Phenanthrene	1.3	J	0.9	J	1.9	J	1.0	J	0.7	J	1.3	J	7.5	J
C1-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Dibenzothiophene	<20	U	<20	U	<20	U	<20	U	<20	U	0.2	J	0.6	J
C1-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Fluoranthene	0.7	J	0.5	J	<20	U	1.0	J	0.4	J	1.0	J	25.3	
Pyrene	0.6	J	0.4	J	<20	U	0.7	J	0.3	J	0.8	J	21.9	
C1-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Naphthobenzothiophene	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U
C1-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C2-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C3-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C4-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
Benz(a)anthracene	<20	U	<20	U	<20	U	<20	U	0.6	J	<20	U	6.8	J
Chrysene/Triphenylene	<20	U	<20	U	<20	U	<20	U	0.2	J	<20	U	4.9	J
C1-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	2.7	J
C2-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U
C3-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U
C4-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U
Benzo(b)fluoranthene	1.3	J	0.5	J	1.0	J	0.9	J	<20	U	1.0	J	9.6	J
Benzo(k,j)fluoranthene	0.1	J	0.1	J	0.1	J	0.2	J	<20	U	0.3	J	3.4	J
Benzo(a)fluoranthene	0.5	J	0.3	J	0.8	J	0.3	J	<20	U	0.5	J	1.3	J
Benzo(e)pyrene	0.1	J	<20	U	0.2	J	0.3	J	<20	U	0.4	J	4.3	J
Benzo(a)pyrene	0.1	J	<20	U	0.1	J	0.3	J	<20	U	0.3	J	5.2	J
Perylene	<20	U	<20	U	<20	U	<20	U	<20	U	0.2	J	1.7	J
Indeno(1,2,3-c,d)pyrene	1.2	J	0.7	J	1.2	J	0.7	J	<20	U	1.0	J	4.8	J
Dibenzo(a,h)anthracene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	0.9	J
Benzo(g,h,i)perylene	<20	U	<20	U	<20	U	0.5	J	<20	U	0.6	J	3.9	J
Total PAHs	83.2		105.2		129.7		82.6		58.9		87.0		265.9	

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix E. PAHs detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Sites									
Compound	7-2	Q	7-3	Q	8-1	Q	9-1	Q	9-2	Q
cis/trans Decalin	<20	U	65.5		31.8		87.0		36.8	
C1-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	69.5	
C2-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Naphthalene	2.6	J	2.9	J	2.5	J	2.4	J	4.9	J
C1-Naphthalenes	<40.1	U	1.1	J	1.2	J	1.6	J	3.0	J
C2-Naphthalenes	9.4	J	2.7	J	7.9	J	8.2	J	33.4	J
C3-Naphthalenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	39.1	
C4-Naphthalenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Benzothiophene	<20	U	<20	U	<20	U	<20	U	<20	U
C1-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Biphenyl	1.8	J	1.9	J	4.1	J	2.3	J	0.9	J
Acenaphthylene	<20	U	<20	U	<20	U	0.8	J	3.6	J
Acenaphthene	<20.1	U	<20.1	U	<20.1	U	2.6	J	23.2	
Dibenzofuran	0.4	J	0.6	J	0.7	J	1.1	J	1.5	J
Fluorene	1.5	J	2.5	J	4.8	J	2.0	J	4.0	J
C1-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Carbazole	34.8		3.7	J	<20.2	U	2.5	J	2.4	J
Anthracene	<20	U	<20	U	<20	U	2.1	J	9.0	J
Phenanthrene	0.8	J	1.3	J	1.2	J	4.0	J	11.9	J
C1-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	4.0	J	8.1	J
C2-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Dibenzothiophene	<20	U	<20	U	<20	U	0.4	J	0.6	J
C1-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Fluoranthene	0.3	J	0.5	J	0.3	J	18.4		36.8	
Pyrene	0.4	J	0.5	J	0.4	J	17.3	J	23.2	
C1-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	7.7	J	16.2	J
C2-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	7.6	J
C3-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Naphthobenzothiophene	<20.2	U	<20.2	U	<20.2	U	<20.2	U	5.8	J
C1-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C2-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C3-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C4-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
Benz(a)anthracene	<20	U	<20	U	0.7	J	4.2	J	12.4	J
Chrysene/Triphenylene	<20	U	<20	U	0.2	J	8.2	J	22.8	
C1-Chrysenes	<40	U	<40	U	<40	U	3.0	J	8.3	J
C2-Chrysenes	<40	U	<40	U	<40	U	3.1	J	5.2	J
C3-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U
C4-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U
Benzo(b)fluoranthene	<20	U	<20	U	<20	U	9.2	J	46.2	
Benzo(k,j)fluoranthene	<20	U	<20	U	<20	U	7.8	J	21.8	
Benzo(a)fluoranthene	<20	U	<20	U	<20	U	2.1	J	1.0	J
Benzo(e)pyrene	<20	U	<20	U	<20	U	5.6	J	10.3	J
Benzo(a)pyrene	<20	U	<20	U	<20	U	2.4	J	12.4	J
Perylene	<20	U	<20	U	<20	U	1.3	J	4.6	J
Indeno(1,2,3-c,d)pyrene	<20	U	<20	U	<20	U	3.3	J	18.5	
Dibenzo(a,h)anthracene	<20	U	<20	U	<20	U	0.4	J	1.9	J
Benzo(g,h,i)perylene	<20	U	<20	U	<20	U	3.3	J	10.3	J
Total PAHs	52.0		83.2		55.8		218.1		517.3	

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix F. PAHs detected on the PED blanks (ng/PED analysis).

	Blanks															
Compound	Blank 1	Q	Blank 2	Q	Blank 3	Q	Blank 4	Q	Blank 5	Q	Blank 6	Q	Blank 7	Q	Blank 8	Q
cis/trans Decalin	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C1-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Decalins	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Naphthalene	12.1	J	3.5	J	5.3	J	4.0	J	10.4	J	8.1	J	5.6	J	7.5	J
C1-Naphthalenes	6.9	J	1.6	J	3.9	J	2.4	J	3.6	J	3.2	J	2.9	J	3.1	J
C2-Naphthalenes	8.4	J	<40.1	U	<40.1	U	<40.1	U	<40.1	U	5.7	J	<40.1	U	<40.1	U
C3-Naphthalenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Naphthalenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Benzothiophene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C1-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Benzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Biphenyl	1.9	J	1.4	J	1.3	J	1.6	J	1.9	J	1.3	J	1.4	J	1.2	J
Acenaphthylene	0.3	J	<20	U	<20	U	0.4	J	0.3	J	0.2	J	0.3	J	0.2	J
Acenaphthene	0.4	J	<20.1	U	<20.1	U	0.3	J	0.5	J	0.3	J	0.3	J	0.2	J
Dibenzofuran	2.8	J	1.1	J	0.8	J	1.0	J	1.6	J	1.2	J	0.9	J	1.0	J
Fluorene	1.6	J	1.4	J	1.1	J	1.2	J	1.7	J	1.4	J	1.0	J	1.1	J
C1-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Fluorenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Carbazole	3.0	J	2.8	J	2.7	J	3.0	J	3.3	J	2.6	J	2.3	J	2.3	J
Anthracene	0.3	J	0.4	J	0.2	J	0.3	J	0.5	J	0.1	J	0.4	J	<20	U
Phenanthrene	8.5	J	8.7	J	3.2	J	4.7	J	7.1	J	6.8	J	2.5	J	6.3	J
C1-Phenanthrenes/Anthracenes	3.2	J	3.0	J	1.7	J	2.1	J	2.6	J	2.4	J	<40.1	U	<40.1	U
C2-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Phenanthrenes/Anthracenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Dibenzothiophene	0.5	J	0.5	J	0.3	J	0.5	J	0.5	J	0.4	J	0.2	J	0.4	J
C1-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Dibenzothiophenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Fluoranthene	12.1	J	10.9	J	2.3	J	5.4	J	11.4	J	2.4	J	0.6	J	3.1	J
Pyrene	6.8	J	4.7	J	7.1	J	2.1	J	8.3	J	4.4	J	2.4	J	2.3	J
C1-Fluoranthenes/Pyrenes	2.5	J	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C2-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C3-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
C4-Fluoranthenes/Pyrenes	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U	<40.1	U
Naphthobenzothiophene	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U	<20.2	U
C1-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C2-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C3-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
C4-Naphthobenzothiophenes	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U	<40.3	U
Benz(a)anthracene	1.6	J	<20	U	<20	U	<20	U	3.1	J	<20	U	<20	U	<20	U
Chrysene/Triphenylene	3.0	J	<20	U	<20	U	<20	U	5.1	J	<20	U	<20	U	<20	U
C1-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U
C2-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U
C3-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U
C4-Chrysenes	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U	<40	U
Benzo(b)fluoranthene	2.1	J	1.0	J	<20	U	0.7	J	5.8	J	<20	U	<20	U	<20	U
Benzo(k,j)fluoranthene	0.8	J	0.9	J	<20	U	0.3	J	2.8	J	<20	U	<20	U	<20	U
Benzo(a)fluoranthene	2.1	J	1.9	J	<20	U	1.1	J	<20	U	<20	U	<20	U	<20	U
Benzo(e)pyrene	1.1	J	0.9	J	<20	U	0.6	J	3.3	J	<20	U	<20	U	<20	U
Benzo(a)pyrene	0.4	J	0.5	J	<20	U	0.3	J	2.6	J	<20	U	<20	U	<20	U
Perylene	0.1	J	0.1	J	<20	U	0.3	J	0.7	J	<20	U	<20	U	<20	U
Indeno(1,2,3-c,d)pyrene	0.7	J	0.5	J	<20	U	<20	U	2.7	J	<20	U	<20	U	<20	U
Dibenzo(a,h)anthracene	0.5	J	<20	U	<20	U	<20	U	0.6	J	<20	U	<20	U	<20	U
Benzo(g,h,i)perylene	0.9	J	0.7	J	<20	U	0.8	J	3.4	J	<20	U	<20	U	<20	U
Total PAHs	84.5		46.4		29.8		33.2		83.7		40.6		20.6		28.9	

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix G. Alkylated PAHs detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis).

	Site													
Compound	1-1	Q	1-2	Q	1-3	Q	2-1	Q	2-2	Q	2-3	Q	3-1	Q
2-Methylnaphthalene	0.7	J	0.7	J	0.7	J	0.8	J	0.9	J	1.0	J	0.8	J
1-Methylnaphthalene	0.4	J	<20.1	U	0.6	J	0.5	J	0.5	J	0.5	J	0.5	J
2,6-Dimethylnaphthalene	<20.1	U	27.2		47.8		24.6		58.4		29.3		13.7	J
1,6,7-Trimethylnaphthalene	<20	U	<20	U	1.6	J	<20	U	<20	U	<20	U	<20	U
1-Methylfluorene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
4-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2/3-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
1-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
3-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2-Methylanthracene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
4/9-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
1-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
3,6-Dimethylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
Retene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
2-Methylfluoranthene	<20	U	<20	U	<20	U	<20	U	<20	U	0.8	J	<20	U
Benzo(b)fluorene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	0.6	J	<20.1	U
C29-Hopane	14.9	J	24.2		8.5	J	11.1	J	120.9		10.6	J	27.9	
18a-Oleanane	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C30-Hopane	22.8		40.9		11.7	J	17.3		192.9		18.7		46.0	
C20-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C21-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C26(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C26(20R)/C27(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C28(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C27(20R)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C28(20R)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix G. Alkylated PAHs detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Site													
Compound	3-2	Q	3-3	Q	4-1	Q	4-2	Q	4-3	Q	4-3 #035	Q	5-1	Q
2-Methylnaphthalene	1.0	J	1.1	J	0.9	J	1.6	J	1.8	J	1.5	J	0.7	J
1-Methylnaphthalene	0.5	J	0.5	J	0.7	J	1.0	J	0.8	J	1.1	J	0.5	J
2,6-Dimethylnaphthalene	29.1		19.1		5.6	J	10.1	J	13.9	J	<20.1	U	2.4	J
1,6,7-Trimethylnaphthalene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
1-Methylfluorene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
4-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2/3-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
1-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
3-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2-Methylanthracene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
4/9-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
1-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
3,6-Dimethylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
Retene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
2-Methylfluoranthene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
Benzo(b)fluorene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
C29-Hopane	9.8	J	16.2	J	10.5	J	21.6		110.0		12.8	J	6.2	J
18a-Oleanane	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C30-Hopane	13.8	J	22.5		15.8	J	37.1		178.0		16.9	J	6.7	J
C20-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C21-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C26(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C26(20R)/C27(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C28(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C27(20R)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C28(20R)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix G. Alkylated PAHs detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Site													
Compound	5-2	Q	5-3	Q	5-4	Q	6-1	Q	6-2	Q	6-3	Q	7-1	Q
2-Methylnaphthalene	1.0	J	1.0	J	<20.1	U	0.8	J	0.8	J	1.2	J	1.7	J
1-Methylnaphthalene	0.6	J	0.6	J	<20.1	U	0.4	J	0.6	J	0.9	J	1.8	J
2,6-Dimethylnaphthalene	9.6	J	18.7		27.0		3.1	J	4.9	J	30.1		336.6	
1,6,7-Trimethylnaphthalene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
1-Methylfluorene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	2.1	J
4-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2/3-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
1-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
3-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2-Methylanthracene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
4/9-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
1-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
3,6-Dimethylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
Retene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
2-Methylfluoranthene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
Benzo(b)fluorene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
C29-Hopane	41.2		13.2	J	5.5	J	7.2	J	4.6	J	40.4		194.9	
18a-Oleanane	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C30-Hopane	64.8		21.2		12.6	J	10.1	J	9.5	J	60.0		308.2	
C20-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C21-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C26(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C26(20R)/C27(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C28(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C27(20R)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C28(20R)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix G. Alkylated PAHs detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Sites									
Compound	7-2	Q	7-3	Q	8-1	Q	9-1	Q	9-2	Q
2-Methylnaphthalene	<20.1	U	1.1	J	1.2	J	1.2	J	2.9	J
1-Methylnaphthalene	<20.1	U	0.6	J	0.7	J	1.1	J	1.5	J
2,6-Dimethylnaphthalene	9.5	J	14.7	J	5.1	J	4.1	J	35.7	
1,6,7-Trimethylnaphthalene	<20	U	<20	U	<20	U	<20	U	1.3	J
1-Methylfluorene	<20	U	<20	U	<20	U	<20	U	<20	U
4-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2/3-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
1-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
3-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	1.7	J	2.1	J
2-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	0.7	J	2.7	J
2-Methylanthracene	<20.1	U	<20.1	U	<20.1	U	0.4	J	2.1	J
4/9-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	0.9	J	1.5	J
1-Methylphenanthrene	<20.1	U	<20.1	U	<20.1	U	1.2	J	1.4	J
3,6-Dimethylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
Retene	<20	U	<20	U	<20	U	<20	U	<20	U
2-Methylfluoranthene	<20	U	<20	U	<20	U	1.6	J	3.6	J
Benzo(b)fluorene	<20.1	U	<20.1	U	<20.1	U	1.0	J	2.3	J
C29-Hopane	7.6	J	24.8		42.7		13.2	J	36.5	
18a-Oleanane	<20	U	<20	U	<20	U	<20	U	9.2	J
C30-Hopane	17.1	J	40.2		71.4		23.8		50.8	
C20-TAS	<20	U	<20	U	<20	U	<20	U	<20	U
C21-TAS	<20	U	<20	U	<20	U	<20	U	<20	U
C26(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U
C26(20R)/C27(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U
C28(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U
C27(20R)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U
C28(20R)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix H Alkylated PAHs detected on the PED blanks (ng/PED analysis).

	Blanks															
Compound	Blank 1	Q	Blank 2	Q	Blank 3	Q	Blank 4	Q	Blank 5	Q	Blank 6	Q	Blank 7	Q	Blank 8	Q
2-Methylnaphthalene	6.9	J	1.2	J	3.7	J	2.3	J	3.4	J	3.0	J	2.6	J	3.0	J
1-Methylnaphthalene	3.3	J	1.1	J	2.0	J	1.2	J	1.9	J	1.6	J	1.6	J	1.6	J
2,6-Dimethylnaphthalene	1.3	J	<20.1	U	<20.1	U	<20.1	U	<20.1	U	0.5	J	<20.1	U	<20.1	U
1,6,7-Trimethylnaphthalene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
1-Methylfluorene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
4-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
2/3-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
1-Methyldibenzothiophene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
3-Methylphenanthrene	0.8	J	0.9	J	0.4	J	0.5	J	0.7	J	0.5	J	<20.1	U	<20.1	U
2-Methylphenanthrene	1.2	J	1.1	J	0.5	J	0.7	J	0.9	J	0.6	J	<20.1	U	<20.1	U
2-Methylanthracene	0.2	J	0.2	J	0.2	J	0.2	J	0.2	J	0.2	J	<20.1	U	<20.1	U
4/9-Methylphenanthrene	1.1	J	0.9	J	0.8	J	0.7	J	1.0	J	1.6	J	<20.1	U	<20.1	U
1-Methylphenanthrene	0.6	J	0.6	J	0.2	J	0.5	J	0.4	J	0.2	J	<20.1	U	<20.1	U
3,6-Dimethylphenanthrene	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
Retene	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
2-Methylfluoranthene	0.4	J	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
Benzo(b)fluorene	0.2	J	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U	<20.1	U
C29-Hopane	22.7		200.5		11.9	J	56.6		120.0		<20	U	10.3	J	<20	U
18a-Oleanane	6.0	J	52.8		<20	U	15.6	J	<20	U	<20	U	<20	U	<20	U
C30-Hopane	34.3		339.4		14.4	J	95.7		189.8		<20	U	14.1	J	<20	U
C20-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C21-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C26(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C26(20R)/C27(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C28(20S)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C27(20R)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U
C28(20R)-TAS	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U	<20	U

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix I. Organochlorine pesticides detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis).

	Sites															
Compound	1-1	Q	1-2	Q	1-3	Q	2-1	Q	2-2	Q	2-3	Q	3-1	Q	3-2	Q	3-3	Q
Aldrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Dieldrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin Aldehyde	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin Ketone	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Heptachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Heptachlor-Epoxide	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Oxychlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Alpha-Chlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Gamma-Chlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Trans-Nonachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Cis-Nonachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Alpha-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Beta-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Delta-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Gamma-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
DDMU	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	9.5		<5	U	<5	U
2,4'-DDD	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
4,4'-DDD	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
2,4'-DDE	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
4,4'-DDE	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
2,4'-DDT	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
4,4'-DDT	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Total HCH	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Total Chlordane	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Total DDT	0.0		0.0		0.0		0.0		0.0		0.0		9.5		0.0		0.0	

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix I. Organochlorine pesticides detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Sites																			
Compound	4-1	Q	4-2	Q	4-3	Q	4-3 #035	Q	5-1	Q	5-2	Q	5-3	Q	5-4	Q	6-1	Q
Aldrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Dieldrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin Aldehyde	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin Ketone	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Heptachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Heptachlor-Epoxide	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Oxychlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Alpha-Chlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Gamma-Chlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Trans-Nonachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Cis-Nonachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Alpha-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Beta-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Delta-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Gamma-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
DDMU	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
2,4'-DDD	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
4,4'-DDD	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
2,4'-DDE	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
4,4'-DDE	17.5		<5	U	<5	U	<5	U	5.2		<5	U	3.7	J	<5	U	3.1	J
2,4'-DDT	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
4,4'-DDT	16.7		<5	U	<5	U	<5	U	9.4		<5	U	<5	U	<5	U	8.1	
Total HCH	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Total Chlordane	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Total DDT	34.3		0.0		0.0		0.0		14.7		0.0		3.7		0.0		11.2	

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix I. Organochlorine pesticides detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Sites													
Compound	6-2	Q	6-3	Q	7-1	Q	7-2	Q	7-3	Q	8-1	Q	9-1	Q	9-2	Q
Aldrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Dieldrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin Aldehyde	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin Ketone	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Heptachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Heptachlor-Epoxide	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Oxychlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Alpha-Chlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Gamma-Chlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Trans-Nonachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Cis-Nonachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Alpha-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Beta-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Delta-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Gamma-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
DDMU	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	90.5		412.1	
2,4'-DDD	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	37.9		134.4	
4,4'-DDD	<5	U	<5	U	6.9		<5	U	<5	U	<5	U	75.5		147.0	
2,4'-DDE	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	88.4		175.8	
4,4'-DDE	<5	U	<5	U	22.3		<5	U	<5	U	<5	U	628.0		950.1	
2,4'-DDT	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	5.4		88.6	
4,4'-DDT	<5	U	<5	U	7.8		<5	U	<5	U	<5	U	10.5		152.4	
Total HCH	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Total Chlordane	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Total DDT	0.0		0.0		37.1		0.0		0.0		0.0		936.2		2,060.5	

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix J. Organochlorine pesticides detected on the PED blanks (ng/PED analysis).

	Blanks															
Compound	Blank 1	Q	Blank 2	Q	Blank 3	Q	Blank 4	Q	Blank 5	Q	Blank 6	Q	Blank 7	Q	Blank 8	Q
Aldrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Dieldrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin Aldehyde	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Endrin Ketone	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Heptachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Heptachlor-Epoxide	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Oxychlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Alpha-Chlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Gamma-Chlordane	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Trans-Nonachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Cis-Nonachlor	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Alpha-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Beta-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Delta-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Gamma-HCH	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
DDMU	<5	U	<5	U	<5	U	<5	U	0.4	J	<5	U	<5	U	<5	U
2,4'-DDD	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
4,4'-DDD	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
2,4'-DDE	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
4,4'-DDE	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
2,4'-DDT	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
4,4'-DDT	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Total HCH	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Total Chlordane	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Total DDT	0.0		0.0		0.0		0.0		0.4		0.0		0.0		0.0	

Notes: Q, Data qualifier; J, below method detection level (MDL); U, not detected.

Appendix K. Polychlorinated biphenyls (PCBs) detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis).

	Sites																							
Compound	1-1	Q	1-2	Q	1-3	Q	2-1	Q	2-2	Q	2-3	Q	3-1	Q	3-2	Q	3-3	Q	4-1	Q	4-2	Q	4-3	Q	4-3 #035	Q
PCB 1	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 2	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 3	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 4/10	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 7/9	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 6	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 8/5	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 14	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 11	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 12	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 13	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 15	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 19	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 30	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 18	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 17	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 27	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 24	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 16/32	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 34	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 23	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 29	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 26	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 25	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 28/31	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 21/20/33	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 22	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 36	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 39	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 38	1.0	J	0.5	J	0.8	J	0.8	J	0.6	J	0.8	J	0.8	J	0.6	J	1.3	J	1.8	J	<5	U	<5	U	13.5	
PCB 35	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 37	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 54	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 50	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 53	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 51	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 45	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 46/69/73	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 52	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 43	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 49	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 48/75/47	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 65	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 62	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 44	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 59	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 42	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 72	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 71	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 68/41/64	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 40/57	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 67	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 58	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 63	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 61/74	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 76/70	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 66/80	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 55	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 56	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 60	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 79	8.7		5.1		9.0		16.4		4.5		9.9		12.1		4.7		11.6		6.3		11.3		13.4		25.9	
PCB 78	5.6		3.1	J	6.1		11.2		2.7	J	6.2		7.7		3.2	J	7.9		4.0	J	7.7		9.5		19.5	
PCB 81	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 77	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 104	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 96/103	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 100	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 94	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 102/98	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 121/93/95	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 88	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 91	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 92	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 84/90	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 101/89/113	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 99	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 119	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 112	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 120/83	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 97/125/86	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U

Appendix K. Polychlorinated biphenyls (PCBs) detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Sites																							
Compound	1-1	Q	1-2	Q	1-3	Q	2-1	Q	2-2	Q	2-3	Q	3-1	Q	3-2	Q	3-3	Q	4-1	Q	4-2	Q	4-3	Q	4-3 #035	Q
PCB 116/117	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 111/115/87	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 109	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 85	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 110	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 82	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 124	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 108/107	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 123	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 118/106	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 114/122	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 105/127	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 126	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 155	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 150	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 152	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 148/145	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 136/154	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 151	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 135	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 144	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 147	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 149/139	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 140	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 143	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 134/133	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 165/131	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 142/146/161	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 153/168	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 132	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 137	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 128/167	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 186/178	3.7	J	1.9	J	2.2	J	4.8		0.0	J	3.3	J	6.7		1.5	J	3.4	J	2.0	J	4.1	J	0.0	J	14.5	
PCB 175	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 187/182	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 192/172	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 180/193	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 170/190	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 202	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 203/196	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 195	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 194	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 205	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 207	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 209	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Total PCB w/ PRC	19		11		18		33		8		20		27		10		24		14		23		23		73	
Total PCB w/o PRC	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	

Appendix K. Polychlorinated biphenyls (PCBs) detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Sites																			
Compound	5-1	Q	5-2	Q	5-3	Q	5-4	Q	6-1	Q	6-2	Q	6-3	Q	7-1	Q	7-2	Q	7-3	Q	8-1	v	9-1	Q	9-2	Q
PCB 1	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 2	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 3	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 4/10	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 7/9	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 6	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 8/5	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	3.6	J	<5	U
PCB 14	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 11	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 12	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 13	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 15	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 19	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 18	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	10.8		<5	U
PCB 17	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 27	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
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PCB 16/32	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	7.5		<5	U
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PCB 23	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 29	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 26	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 25	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 28/31	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	4.9		4.3	J
PCB 21/20/33	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 22	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 36	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 39	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 38	0.0	J	<5	U	<5	U	3.7	J	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	95.2		<5	U
PCB 35	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	29.3	
PCB 37	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	6.3	
PCB 54	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 50	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 53	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	1.9	J	3.7	J
PCB 51	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	3.1	J	2.0	J
PCB 45	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 46/69/73	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 52	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	7.4		58.3	
PCB 43	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 49	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	4.1	J	23.3	
PCB 48/75/47	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	19.6		36.6	
PCB 65	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 62	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 44	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	2.0	J	15.6	
PCB 59	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 42	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 72	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 71	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 68/41/64	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	10.5	
PCB 40/57	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 67	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	3.6	J
PCB 58	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 63	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	1.8	J
PCB 61/74	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	2.4	J	24.8	
PCB 76/70	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	10.2		116.0	
PCB 66/80	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	3.4	J	27.5	
PCB 55	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 56	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	12.5	
PCB 60	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 79	3.4	J	13.0		4.9		28.8		7.6		1.8	J	12.1		13.4		2.7	J	10.1		<5	U	122.1		47.2	
PCB 78	2.8	J	8.6		3.2	J	18.2		5.6		1.3	J	8.4		8.0		1.9	J	6.4		<5	U	97.1		35.5	
PCB 81	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	4.2	J
PCB 77	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	2.2	J	49.4	
PCB 104	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 96/103	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 100	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 94	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 102/98	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	6.7	
PCB 121/93/95	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	9.5		99.0	
PCB 88	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 91	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	2.2	J	26.1	
PCB 92	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	2.9	J	40.7	
PCB 84/90	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	4.6		<5	U	<5	U	<5	U	20.9		<5	U
PCB 101/89/113	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	312.7	
PCB 99	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	3.0	J	<5	U	<5	U	<5	U	14.4		175.2	
PCB 119	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	8.5	
PCB 112	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	9.3	
PCB 120/83	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 97/125/86	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	5.1		76.5	

Appendix K. Polychlorinated biphenyls (PCBs) detected on the PEDs deployed around Cocos Island in Cocos Lagoon, Guam (ng/PED analysis) (cont.).

	Sites																	
Compound	5-1 Q	5-2 Q	5-3 Q	5-4 Q	6-1 Q	6-2 Q	6-3 Q	7-1 Q	7-2 Q	7-3 Q	8-1 v	9-1 Q	9-2 Q
PCB 116/117	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	0.9 J	13.2
PCB 111/115/87	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	6.6	105.6
PCB 109	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 85	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	3.1 J	52.7
PCB 110	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	21.7	333.0
PCB 82	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	17.5
PCB 124	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	15.1
PCB 108/107	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	3.7 J	43.0
PCB 123	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	414.1
PCB 118/106	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	5.4	<5 U	<5 U	<5 U	23.3	<5 U
PCB 114/122	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 105/127	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	8.7	119.2
PCB 126	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	11.6
PCB 155	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 150	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 152	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1.3 J
PCB 148/145	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	4.0 J	<5 U	<5 U	<5 U	2.6 J	5.5
PCB 136/154	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1.8 J	27.0
PCB 151	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1.6 J	24.9
PCB 135	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	11.1
PCB 144	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	7.5
PCB 147	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 149/139	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	2.6 J	<5 U	<5 U	<5 U	9.0	150.4
PCB 140	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 143	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 134/133	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	15.3
PCB 165/131	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	3.7 J
PCB 142/146/161	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	2.5 J	34.9
PCB 153/168	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	4.9	<5 U	<5 U	<5 U	16.2	232.8
PCB 132	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 141	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1.4 J	38.9
PCB 137	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	22.9
PCB 130	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	18.6
PCB 164/163	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	17.9	99.6
PCB 138/160/158	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	5.4	<5 U	<5 U	<5 U	<5 U	319.4
PCB 129	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	12.5
PCB 166	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	3.0 J
PCB 159	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 162	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 128/167	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	6.9	100.5
PCB 156	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	3.1 J	45.7
PCB 157	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	11.8
PCB 169	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 188	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 184	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 179	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 176	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	2.3 J
PCB 186/178	1.3 J	4.1 J	<5 U	6.3	2.5 J	<5 U	2.9 J	3.2 J	<5 U	1.9 J	5.2	64.6	31.4
PCB 175	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 187/182	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1.3 J	14.6
PCB 183	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	10.4
PCB 185	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 174	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 181	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	13.1
PCB 177	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	8.4
PCB 171	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	7.2
PCB 173	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 192/172	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	3.1 J
PCB 180/193	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	2.1 J	41.6
PCB 191	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 170/190	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1.6 J	32.1
PCB 189	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 202	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 201	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 204	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 197	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 200	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 198	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 199	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 203/196	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 195	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 194	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 205	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 208	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 207	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 206	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
PCB 209	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U
Total PCB w/ PRC	8	26	8	57	16	3	23	54	5	18	5	653	3,744
Total PCB w/o PRC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.4	0.0	0.0	0.0	274.2	3,630

Appendix L. Polychlorinated biphenyls (PCBs) detected on the PED blanks (ng/PED analysis).

	Blanks															
Compound	Blank 1	Q	Blank 2	Q	Blank 3	Q	Blank 4	Q	Blank 5	Q	Blank 6	Q	Blank 7	Q	Blank 8	Q
PCB 1	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 2	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 3	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 4/10	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 7/9	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 6	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 8/5	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 14	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 11	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 12	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 13	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 15	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 19	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 30	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 18	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 17	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 27	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 24	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 16/32	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 34	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 23	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 29	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 26	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 25	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 28/31	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 21/20/33	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 22	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 36	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 39	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 38	86.6		145.5		178.1		61.5		87.9		123.5		48.9		131.7	
PCB 35	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 37	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 54	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 50	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 53	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 51	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 45	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 46/69/73	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 52	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 43	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 49	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 48/75/47	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 65	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 62	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 44	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 59	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 42	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 72	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 71	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 68/41/64	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 40/57	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 67	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 58	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 63	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 61/74	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 76/70	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 66/80	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 55	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 56	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 60	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 79	67.5		107.4		139.8		39.7		56.9		96.4		32.7		101.4	
PCB 78	59.9		97.6		123.0		36.7		53.1		84.9		29.6		88.6	
PCB 81	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 77	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 104	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 96/103	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 100	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 94	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 102/98	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 121/93/95	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 88	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 91	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 92	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 84/90	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 101/89/113	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 99	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 119	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 112	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 120/83	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 97/125/86	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U

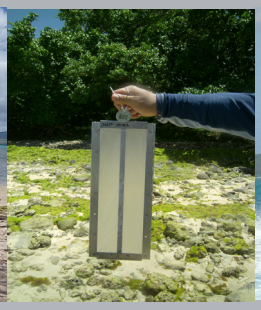
Appendix L. Polychlorinated biphenyls (PCBs) detected on the PED blanks (ng/PED analysis) (cont.).

	Blanks															
Compound	Blank 1	Q	Blank 2	Q	Blank 3	Q	Blank 4	Q	Blank 5	Q	Blank 6	Q	Blank 7	Q	Blank 8	Q
PCB 116/117	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 111/115/87	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 109	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 85	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 110	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 82	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 124	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 108/107	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 123	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 118/106	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 114/122	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 105/127	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 126	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 155	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 150	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 152	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 148/145	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 136/154	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 151	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 135	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 144	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 147	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 149/139	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 140	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 143	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 134/133	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 165/131	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 142/146/161	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 153/168	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 132	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 141	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 137	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 130	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 164/163	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 138/160/158	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 129	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 166	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 159	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 162	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 128/167	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 156	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 157	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 169	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 188	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 184	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 179	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 176	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 186/178	25.6		42.2		54.8		17.2		25.1		37.9		14.3		40.6	
PCB 175	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 187/182	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 183	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 185	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 174	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 181	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 177	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 171	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 173	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 192/172	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 180/193	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 191	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 170/190	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 189	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 202	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 201	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 204	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 197	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 200	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 198	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 199	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 203/196	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 195	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 194	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 205	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 208	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 207	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 206	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
PCB 209	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U	<5	U
Total PCB w/ PRC	240		393		496		155		223		343		125		362	
Total PCB w/o PRC	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	

U.S. Department of Commerce
Wilbur Ross, *Deputy Secretary*

National Oceanic and Atmospheric Administration
Benjamin Friedman, *Acting Under Secretary*

National Ocean Service
Nicole LeBoeuf, Acting *Assistant Administrator for Ocean Service and Coastal Zone Management*

The mission of the National Centers for Coastal Ocean Science is to provide managers with scientific information and tools needed to balance society's environmental, social and economic goals. For more information, visit: http://www.coastalscience.noaa.gov/.