LMS/AMC/S08833

Amchitka Island, Alaska, Biological Monitoring Report 2011 Sampling Results

September 2013

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Abbreviations

^{241}Am	americium-241
^{134}Cs	cesium-134
^{137}Cs	cesium-137
^{3}H	tritium
^{210}Pb	lead-210
^{210}Po	polonium-210
^{239}Pu	plutonium-239
^{240}Pu	plutonium-240
^{234}U	uranium-234
^{235}U	uranium-235
^{236}U	uranium-236
^{238}U	uranium-238
ADEC	Alaska Department of Environmental Conservation
AEC	U.S. Atomic Energy Commission
ANL	Argonne National Laboratory
APIA	Aleutian Pribilof Islands Association
BAF	bioaccumulation factor
BCG	Biota Concentration Guide
COC	chain-of-custody
CRESP	Consortium for Risk Evaluation and Stakeholder Participation
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
g	gram
g/day	grams per day
HDPE	high-density polyethylene
IAEA	International Atomic Energy Agency
ICP-MS	inductively coupled plasma mass spectrometry
kg	kilogram
kPa	kilopascal

L	liter
LBV	lower-box value
LLNL	Lawrence Livermore National Laboratory
LM	Office of Legacy Management
LTHMP	Long-term Hydrologic Monitoring Program
LTS&M	long-term surveillance and maintenance
MDC	minimum detectable concentration
mg	milligram
mL	milliliter
oz	ounce
p	probability
pCi	picocuries
pCi/L	picocuries per liter
rad	radiation absorbed dose
R/V	research vessel
σ	sigma
SD	standard deviation
SF	slope factor
TU	Tritium Unit
UAF	University of Alaska Fairbanks
UBV	upper-box value
USFWS	U.S. Fish and Wildlife Service

Executive Summary

The Long-Term Surveillance and Maintenance (LTS&M) Plan for the U.S. Department of Energy (DOE) Office of Legacy Management (LM) Amchitka Island sites describes how LM plans to conduct its mission to protect human health and the environment at the three nuclear test sites located on Amchitka Island, Alaska.

Amchitka Island, near the western end of the Aleutian Islands, is approximately 1,340 miles west-southwest of Anchorage, Alaska. Amchitka is part of the Aleutian Island Unit of the Alaska Maritime National Wildlife Refuge, which is administered by the U.S. Fish and Wildlife Service (USFWS). Since World War II, Amchitka has been used by multiple U.S. government agencies for various military and research activities. From 1943 to 1950, it was used as a forward air base for the U.S. Armed Forces. During the middle 1960s and early 1970s, the U.S. Department of Defense (DOD) and the U.S. Atomic Energy Commission (AEC) used a portion of the island as a site for underground nuclear tests. During the late 1980s and early 1990s, the U.S. Navy constructed and operated a radar station on the island.

Three underground nuclear tests were conducted on Amchitka Island. DOD, in conjunction with AEC, conducted the first nuclear test (named Long Shot) in 1965 to provide data that would improve the United States' capability of detecting underground nuclear explosions. The second nuclear test (Milrow) was a weapons-related test conducted by AEC in 1969 as a means to study the feasibility of detonating a much larger device. Cannikin, the third nuclear test on Amchitka, was a weapons-related test detonated on November 6, 1971. With the exception of small concentrations of tritium detected in surface water shortly after the Long Shot test, radioactive fission products from the tests remain in the subsurface at each test location.

As a continuation of the environmental monitoring that has taken place on Amchitka Island since before 1965, LM in the summer of 2011 collected biological and seawater samples from the marine and terrestrial environment of Amchitka Island adjacent to the three detonation sites and at a background or reference site, Adak Island, 180 miles to the east. Consistent with the goals of the Amchitka LTS&M Plan, four data quality objectives (DQOs) were developed for the 2011 sampling event, as follows:

- The first objective was to collect selected marine flora and fauna, lichen, soil, and marine sediment and analyze the samples for test-related radionuclides to determine if subsistence- and commercial-catch seafood is safe to eat.
- The second objective provided the rationale for using biota data from the first objective for input in the RESRAD-BIOTA code to analyze the potential ecological risks from the radionuclides.
- The third objective supported the collection of tritium data in seawater.
- The fourth objective supported the collection of reindeer lichen and soil beneath the lichen and marine sediment and to analyze for cesium-137 (^{137}Cs).

Samples were analyzed for test-related radionuclides; americium-241 (^{241}Am), ^{137}Cs, plutonium-239 (^{239}Pu) and -240 (^{240}Pu), and tritium as well as uranium-234 (^{234}U), -235 (^{235}U), and -238 (^{238}U). In planning for the 2011 sampling event, a group of stakeholders representing the federal government, the State of Alaska, and the Aleutian Pribilof Island Association,

collectively called the Amchitka Working Group, selected 14 biological species for analysis. A similar sampling event was conducted at Adak, which is used as a background or reference area unaffected by the underground nuclear tests at Amchitka. The previous investigations used the island of Kiska, Alaska, as the background or reference area, but the Amchitka Working Group decided that Adak would be a technically suitable reference or background location for the 2011 sampling event. The species sampled were identified based on diet information representing some of the subsistence- and commercial-catch seafood in the western Aleutian Islands.

Biological sampling began June 20, 2011, and continued through July 21, 2011. Two ocean-going research vessels provided the logistical support for the biological and seawater sampling operations. Biological sampling operations varied from personnel collecting samples from the island and along the shoreline to scientific divers performing two dives a day to collect the majority of the biological samples. Overall, a total of 350 biological samples and 166 seawater samples were collected.

The ranges of radionuclides measured in marine species and other media sampled during the 2011 monitoring program are summarized in Table ES-1.

A statistical comparison of the data collected from Amchitka and Adak (the reference location) indicates that the concentrations of nuclides are statistically consistent to each other. Overall, there is a pattern toward slightly higher concentration at the Amchitka site. The measures that seem to show the most deviation have limited data above the detection limits.

To address the first DQO, risk calculations were done using tissue data from the various seafood species collected in 2011 from Amchitka and Adak. A range of Aleut diets (based on published surveys of four villages) and a composite diet were used as dietary intake information for the risk estimates. The estimates for the five diets indicate that overall potential risks from the ingestion of seafood are similar and are at 2×10^{-5} (2 in 100,000) or lower (i.e., within the U.S. Environmental Protection Agency's acceptable risk range of 1×10^{-6} to 1×10^{-4} [1 in 1,000,000 to 1 in 10,000]). The primary contributors to the risk estimates are the ^{137}Cs and $^{234, 235,}$ and ^{238}U concentrations.

The risk estimates using Amchitka data are higher by 1×10^{-6} (1 in 1,000,000) than those using Adak data. This difference is lower than the 1×10^{-5} (1 in 100,000) risk level used by the State of Alaska as the benchmark for acceptable risk. Hence, based on the 2011 data collected for Amchitka and Adak, seafood harvested at Amchitka and Adak is considered safe for consumption at the intake levels for each of five diets evaluated. In addition, the increased cesium concentrations detected in the samples, due to the Fukushima Dai-ichi event, have not resulted in unacceptable risk levels from the ingestion of these seafoods.

For the second DQO, representative radionuclide concentrations in seawater, obtained from sampling data for nine marine species, were used as input to the RESRAD-BIOTA code for comparison with Biota Concentration Guidelines (BCGs) for water. The sum of ratios of radionuclide concentrations to BCGs was much lower than the threshold value of 1 and far below the potential radiation dose to marine species of 0.1 rad/day; therefore, no further analysis was required.

Table ES-1. Ranges of Radionuclides Measured in Marine Species and other Media: 2011 Monitoring

Species	^{137}Cs	^{241}Am	^{239}Pu	^{240}Pu	^{234}U	^{235}U	^{238}U
Dragon kelp							
Amchitka (*n* = 27)	0.24–3.2	0.003–0.033	0.003–0.16	0.007–0.13	12.4–44.6	0.41–1.5	9.6–35.4
Adak (*n* = 18)	0.2–2.0	0.006–0.027	0.014–0.11	0.01–0.09	7.3–46.8	0.27–1.6	6.3–38.2
Sea urchin							
Amchitka (*n* = 9)	1.8 – 9.9	0.08–0.2	0.033–0.09	<0.02–0.065	16.7–26.4	0.57–0.83	13.5–19.5
Adak (*n* = 6)	2.7–9.4	0.07–0.12	<0.04–0.07	ND (<0.04)	17.4–28.5	0.20–0.83	4.7–19.3
Horse mussel							
Amchitka (*n* = 9)	5.9–<44	0.11– <0.4	0.1 – <2.0	ND (<1.0)	23.4–80.8	0.53–2.9	12.2–67.1
Adak (*n* = 6)	3.4–15	0.09–0.15	0.073– <0.2	ND (<0.1)	9.7–49.8	0.29–1.8	6.8–41.1
Chiton							
Amchitka (*n* = 9)	1.6–4.1	0.07–0.14	0.03 – <0.07	ND (<0.04)	5.0–32.4	0.12–1.1	2.9–26.8
Adak (*n* = 6)	0.8–1.3	0.017–0.08	<0.03–0.06	ND (<0.03)	5.1–32.5	0.15–0.99	3.6–23.2
Rockfish							
Amchitka (*n* = 26)	1.1–6.4	0.009–0.07	ND (<0.06)	ND (<0.03)	2.3–19.5	0.08–0.60	1.9–14.2
Adak (*n* = 15)	1.2–9.4	ND (<0.02)	ND (<0.06)	ND (<0.03)	1.3–13.4	0.04–0.48	1.0–11.4
Greenling							
Amchitka (*n* = 27)	1.9–7.8	0.03–0.05	0.018–<0.08	ND (<0.04)	2.5–11.4	0.08–0.39	1.8–9.1
Adak (*n* = 18)	0.9–7.4	0.009–0.033	ND (<0.07)	ND (<0.04)	2.0–10.7	0.05–0.31	1.1–7.3
Irish lord							
Amchitka (*n* = 27)	1.2–9.5	0.006–0.05	ND (<0.08)	ND (<0.04)	3.0–19.3	0.09–0.68	2.0–16.1
Adak (*n* = 18)	1.8–13	<0.003–0.03	ND (<0.07)	ND (<0.04)	1.9–16	0.06–0.55	1.5–13
Octopus							
Amchitka (*n* = 3)	0.23–2.1	0.009–0.019	0.027–0.031	ND (<0.03)	10.6–21.8	0.37–0.77	8.5–18.1
Adak (*n* = 1)	0.7	0.015	0.02	ND (<0.01)	13.6	0.45	10.7
Pacific cod							
Amchitka (*n* = 3)	2.1–3.8	ND (<0.003)	ND (<0.01)	ND (<0.003)	2.5–3.0	0.03–0.09	0.8–2.1
Adak (*n* = 2)	2.0–3.0	ND (<0.001)	ND (<0.01)	ND (<0.003)	1.9	0.05–0.06	1.2–1.4
Halibut							
Amchitka (*n* = 3)	0.82–1.5	ND (<0.001)	ND (<0.01)	ND (<0.003)	0.6– <1.6	0.01–0.03	0.2–0.65
Adak (*n* = 1)	1.0	ND (<0.001)	ND (<0.01)	ND (<0.003)	1.6	0.04	0.86
Rockweed							
Amchitka (*n* = 27)	1.3–5.8	0.003–0.011	0.002–0.012	0.005–0.008	35.0–144	1.2–5.1	29–121
Adak (*n* = 18)	1.0–7.3	0.006–0.015	0.002–0.019	0.006–0.011	45.5–144	1.6–5.1	37–120
Reindeer lichen							
Amchitka (*n* = 3)	404–1523						
Adak (*n* = 3)	2855–6236						
Gull eggs							
Amchitka (*n* = 1)	4.2	ND (<0.008)	ND (<0.03)	ND (<0.02)	0.6	0.0007	0.015
Dolly Varden							
Amchitka (*n* = 1)	98	ND (<0.001)	ND (<0.01)	ND (<0.01)	ND (<1.3)	0.01	0.23
Adak (*n* = 1)	447	ND (<0.003)	ND (<0.01)	ND (<0.01)	0.9	0.02	0.36
Soil							
Amchitka (*n* = 3)	312–6110						
Adak (*n* = 3)	1135–7264						
Sediment							
Amchitka (*n* = 2)	11.9–36.3						

All units in picocuries per kilogram (pCi/kg) wet weight except for soil and sediment, which are reported in dry weight. Maximum values listed are the maximum reported, even if below the minimum detectable concentration (MDC) (U-flagged). For example, the maximum ^{137}Cs for horse mussel on Amchitka listed above (44U pCi/kg) was below the MDC, vs. the maximum detected result of 14 pCi/kg.
ND – Not Detected (all results <MDC). Reindeer lichen, soil, and sediment analyzed for ^{137}Cs only.

For the third DQO, samples were collected in 2011 to develop a baseline of tritium concentrations for seawater near Amchitka and Adak. Previous studies and contaminant transport modeling predict that tritium will be the leading indicator of migration from the detonation points. Therefore, this study used low detection levels and targeted the most likely locations to obtain a baseline for tritium in seawater at Amchitka. The results showed that the activity of tritium in the marine environment surrounding Amchitka and Adak is similar to that resulting from global fallout from nuclear testing and natural tritium levels in the northern hemisphere. The data from the 2011 sampling event are in agreement with previous sampling results. Amchitka Island tritium levels from the 2011 sampling event ranged from 1.2 to 2.8 picocuries per liter.

For the fourth DQO, ^{137}Cs was measured in the reindeer lichen and soil on Amchitka and Adak. The data will provide perspective to long-term baseline data considered for Amchitka and Adak. The ^{137}Cs concentrations varied significantly among different samples, especially ^{137}Cs concentrations in soil beneath the lichen, for which the maximum values were 5–20 times higher than the minimum values. The lichen and soil beneath the lichen showed that ^{137}Cs levels in Adak were higher than the levels in Amchitka. The concentrations of ^{134}Cs in samples collected from Amchitka and Adak indicate that atmospheric transport of airborne contamination from the Fukushima Dai-ichi event may have contributed to the levels detected.

1.0 Introduction

1.1 Amchitka Island History

Amchitka Island, near the western end of the Aleutian Islands, is approximately 1,340 miles west-southwest of Anchorage, Alaska (Figure 1). Amchitka is part of the Aleutian Island Unit of the Alaska Maritime National Wildlife Refuge, which is administered by the U.S. Fish and Wildlife Service (USFWS). Since World War II, Amchitka has been used by multiple U.S. government agencies for various military and research activities. From 1943 to 1950, it was used as a forward air base for the U.S. Armed Forces. During the middle 1960s and early 1970s, the U.S. Department of Defense (DOD) and the U.S. Atomic Energy Commission (AEC) used a portion of the island as a site for underground nuclear tests. During the late 1980s and early 1990s, the U.S. Navy constructed and operated a radar station on the island.

Three underground nuclear tests were conducted on Amchitka Island. DOD, in conjunction with AEC, conducted the first nuclear test (named Long Shot) in 1965 to provide data that would improve the United States' capability of detecting underground nuclear explosions. The second nuclear test (Milrow) was a weapons-related test conducted by AEC in 1969 as a means to study the feasibility of detonating a much larger device. Cannikin, the third nuclear test on Amchitka was a weapons-related test detonated on November 6, 1971. With the exception of tritium detected in surface water in several locations shortly after the Long Shot test, radioactive fission products from the tests remain in the subsurface at each test location.

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) retains responsibility for those areas on Amchitka Island that were agreed to in the 2001 Letter of Agreement between USFWS and DOE (DOE 2001). As detailed in the USFWS *Remedial Action/Removal Action Environmental Assessment Finding of No Significant Impact* (USFWS 2000), LM has responsibility for portions of the island where drilling mud is encapsulated in engineered disposal cells. LM has long-term surveillance and maintenance (LTS&M) responsibility for three underground test sites and seven surface-closed sites where drilling mud is stored.

The *Long-Term Surveillance and Maintenance Plan for the U.S. Department of Energy Amchitka, Alaska, Site* (DOE 2008) describes how LM intends to fulfill its mission to maintain protection of human health and the environment and fulfill its obligations for LTS&M at Amchitka. The LTS&M Plan is reviewed and updated, if necessary, every 5 years by LM. Surface remediation has been accomplished through capping the mud pits and closing the asphalt tanks in place. The Alaska Department of Environmental Conservation (ADEC) has accepted this work as being protective of human health and the environment (ADEC 2004).

Radioactive fission products remain in and around the subsurface cavities formed by the nuclear tests. Data collected since the detonations do not indicate that radionuclides have migrated into the accessible environment. Other than small quantities of radionuclides from Long Shot, there was no exposure to humans or the environment from the detonations (Merritt and Fuller 1977; DOE 1982; DOE 2000; Dasher et al. 2002; CRESP 2005; Burger et al. 2006; Burger et al. 2007a and 2007b). No feasible technology exists for removing the subsurface radioactivity associated with the nuclear test cavities; therefore, LM conducts monitoring near these sites to protect the public safety.

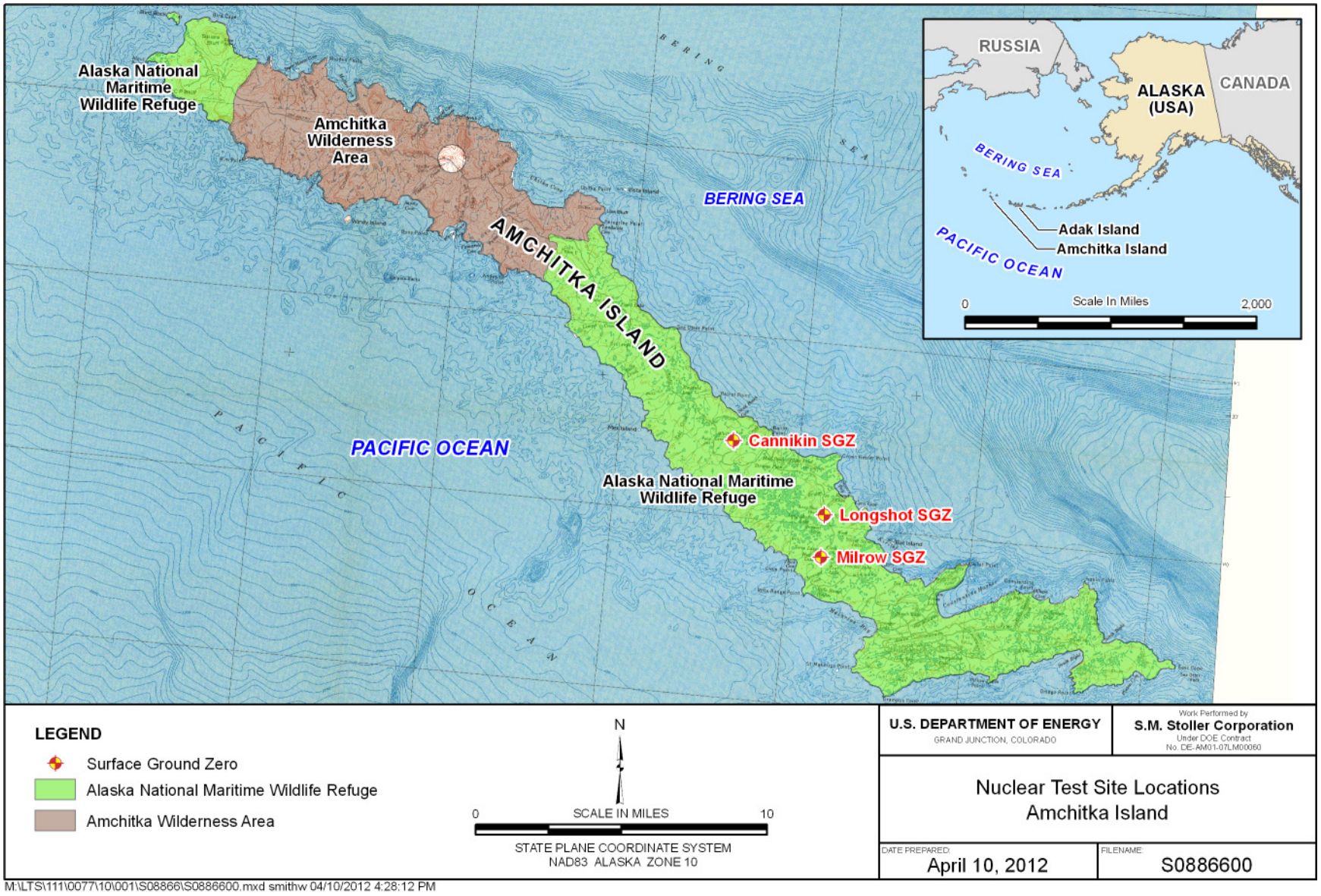

Figure 1. Amchitka Test Site Locations

Computer modeling has indicated that over time, some of the subsurface residual radionuclides will migrate away from the blast cavities and may eventually reach the near-surface marine environment (DOE 2002b). Breakthrough of radionuclides to the marine environment is not expected for more than 2000 years (Hassan and Chapman 2006).

The potential for residual radionuclide release and the fact that Aleuts living in the Aleutian Islands harvest fish and other subsistence foods from this area and commercial fisheries operate in the area are the basis for the biological and terrestrial sampling conducted on Amchitka and Adak Islands during the late spring and early summer of 2011. LM wants to assess the possibility that selected residual radionuclides from the nuclear tests conducted on Amchitka Island might be entering the marine food chain, resulting in potential ecological and human health effects.

1.2 Previous Environmental Studies

This section summarizes previous scientific studies performed on and around Amchitka that were similar in purpose to the 2011 sampling event.

The Environment of Amchitka Island, Alaska (Merritt and Fuller 1977) is a multidisciplinary work that provides a concise review of the geology, ecology, and radionuclides in air, water, and biota with an emphasis on "the search for and identity of radionuclides of Amchitka origin in the samples and [contributing] to the general knowledge of the distribution of radionuclides in the environment." This evaluation found no evidence that any test-related radionuclides had escaped from the three underground nuclear test sites at Amchitka except for trace quantities of radionuclides, principally tritium, in water and soil gas samples taken in the immediate vicinity of the Long Shot test.

The Amchitka Radiobiological Program began in 1970 and continued through 1979. The program's principal objective was to collect biological and groundwater samples for radiobiological analyses and to determine the extent of radionuclide contamination from worldwide atmospheric fallout and from the detonation of the three underground nuclear tests on Amchitka. Migration of radionuclides from the underground test sites would be suspected if the concentration of radionuclides were significantly greater than could be attributed to worldwide fallout or if an unexpected assemblage of radionuclides were detected. In the *Amchitka Radiobiological Program Final Report July 1970 to December 1979* (DOE 1982), it was determined that no radionuclides from the underground sites were detected, except for tritium from the Long Shot test, which produced increased tritium concentrations in surface water and freshwater plants near the site.

The Long Term Hydrologic Monitoring Program (LTHMP) monitored Amchitka radioactivity levels in groundwater as part of the Off-Site Environmental Monitoring Program for the Nevada Test Site and Other Test Areas Used for Underground Nuclear Detonations. Amchitka monitoring under this program began in 1977, and since then, sampling occurred from 1977 through 1989 and in 1991, 1993, 1997, and 2001. The U.S. Environmental Protection Agency (EPA) carried out this program and monitored Amchitka to measure levels and trends of radioactivity in the offsite environment surrounding the test areas to ensure that radioactivity levels are below existing radiation protection standards.

In 1997, the LTHMP at Amchitka included radiobiological sampling and analysis. These samples were collected because of a survey of selected aquatic biota that Greenpeace conducted on the island (Greenpeace 1996). Greenpeace speculated that several long-lived manmade radionuclides were migrating into the surface environment from nuclear test cavities several thousand feet below the surface of the island (DOE 2000). The results of the 1997 LTHMP radiobiological sampling indicated there was no evidence of migration from the underground test cavities into the terrestrial or freshwater environments on Amchitka (DOE 2000; Dasher et al. 2002).

In 2004, the Consortium for Risk Evaluation and Stakeholder Participation II (CRESP), a group of independent universities, prepared the *Amchitka Independent Science Assessment: Biological and Geophysical Aspects of Potential Radionuclide Exposures in the Amchitka Marine Environment* (CRESP 2005). The CRESP study concluded that the foods consumed by humans are safe with respect to radionuclides, levels of radionuclides are well below published human health risk guidance levels, and data collected do not suggest that radionuclides in biota collected from Amchitka are attributable to the Amchitka test shots.

1.3 Stakeholder Participation

Amchitka Island is within the Aleutian Island Unit of the Alaska Maritime Refuge, created through an executive order by President William Howard Taft in 1913. LM has a Memorandum of Understanding with USFWS, the purpose of which is to define the roles and responsibilities of both agencies, specify the means of access to and egress from Amchitka, and explain how LM will exercise institutional controls. USFWS issued access permits to LM in conjunction with the 2011 monitoring and sampling events.

LM provides a financial assistance grant to ADEC and regularly meets with representatives from ADEC, which has partnered with the University of Alaska Fairbanks (UAF) to obtain technical support on the Amchitka project. LM collaborated with ADEC, UAF, and others to plan the 2011 sampling event. UAF provided technical assistance, and the UAF marine biology team supported the 2004 CRESP and 2011 sampling events by providing the scientific diving team that collected the biological samples from the marine environment.

LM provides a financial assistance grant to Aleutian Pribilof Islands Association Inc. (APIA). APIA is the federally recognized tribal organization of the Aleut people in Alaska and is an important component of the LM mission at Amchitka. APIA represents the interests of the Aleuts and assists LM with communications with the Aleut people and ADEC. APIA participates in developing work scope related to the LM mission on Amchitka, participates in regular planning meetings, and assisted with sample collection during the 2011 sampling event.

LM, ADEC, USFWS, and APIA, constitute the Amchitka Working Group. Additionally, LM retained Argonne National Laboratory (ANL) through a work order to help develop the biological Sampling Plan (DOE 2011) and provide technical support with data analysis, risk assessment (human health and ecological), and other technical issues, as required. ANL provided assistance with the sample collection during the 2011 sampling event and the data analysis and human health and ecological risk evaluation (Sections 6 through 9 of this report).

LM also retained Lawrence Livermore National Laboratory (LLNL) through a work order to provide support in the radionuclide analysis of the biological samples collected in 2011. The University of Miami Rosenstiel School of Marine and Atmospheric Science provided tritium data on all seawater samples collected.

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2.0 Purpose of Report

2.1 Data Quality Objectives

LM, in conjunction with representatives from the Amchitka Working Group, ANL, and LLNL, met in late 2010 to plan for the 2011 sampling event. Their collaborative work resulted in the *Sampling Plan for the Amchitka, Alaska, Site 2011 Sampling Event* (DOE 2011), which outlined the following four sets of data quality objectives (DQOs) that provided the rationale for the 2011 sampling effort.

1. To ensure that subsistence- and commercial-catch seafood near Amchitka is safe to eat, the presence of selected (test-related) radionuclides will be determined from 14 marine plant and biological species.
2. The results from DQO #1 will be entered into the RESRAD-BIOTA code to analyze the potential ecological risks from the radionuclides of interest.
3. Tritium data will be determined from seawater samples collected to establish a baseline tritium concentration in seawater.
4. Cesium-137 (^{137}Cs) data will be determined from reindeer lichen, soil beneath the lichen, and marine sediment to establish baseline ^{137}Cs concentrations in reindeer lichen, soil beneath the lichen, and marine sediments.

This report summarizes the work that was performed in the collection of the data to meet these DQOs, presents the results of the laboratory analyses from all the samples collected, and provides an evaluation of the ecological health of the Amchitka and Adak environments.

2.2 Objective of the Sampling Event

The objectives of this sampling program are to examine the concentrations of a selected group of radionuclides in selected microalgae, invertebrates, fish, gull eggs, and sediments in the terrestrial and marine ecosystem on and adjacent to Amchitka Island and to compare the results to the reference site of Adak Island. Interspecific (differences between species) and interisland changes in radionuclide concentrations have been evaluated, and the data have been entered into a database for the continued development of a baseline for past and future comparison and to assess whether the radionuclide concentrations found in the ecosystems of Amchitka and Adak Islands are similar to those found in other parts of the Northern Hemisphere.

To meet the objective of qualitatively comparing the 2011 data to the 2004 data, the sampling locations were in the same general areas as those included in the CRESP sampling event with one exception: Adak Island, instead of Kiska Island, was chosen to be the new reference location. The Amchitka Working Group selected Adak as the reference location for the 2011 sampling event because Adak is easier to access for sampling purposes. It was expected that, like Kiska, data from Adak would be representative of an area considered to be not influenced by the underground tests conducted at Amchitka and would therefore provide data useful for comparison with the Amchitka data.

For the samples collected during the 2011 sampling event, LLNL provided analytical methods with adequately low detection limits to measure the baseline activities of radionuclides in

important biological media, ocean-bottom sediments, and seawater. The radionuclides analyzed were ^{137}Cs, americium-241 (^{241}Am), plutonium-239 (^{239}Pu), plutonium-240 (^{240}Pu), uranium-234 (^{234}U), uranium-235 (^{235}U), and uranium-238 (^{238}U).

LM also collected baseline data on tritium (^{3}H) in seawater off the shoreline of the Cannikin site, and reindeer lichen and soil beneath the lichen were also collected and tested for ^{137}Cs. Following the atmospheric releases from the Fukushima Dai-ichi nuclear power plant in March 2011, the Amchitka Working Group questioned whether these releases might affect the ability to interpret background activity concentrations of target radionuclides from the Amchitka 2011 sampling event. Therefore, reindeer lichen and soil beneath the lichen were also tested for cesium-134 (^{134}Cs).

3.0 Description of Sampling

3.1 Location and Sampling Sites

The Amchitka and Adak sample locations are shown in Figure 2 and Figure 3, respectively. Adak Island, located approximately 200 miles east of Amchitka Island, was selected as the reference location (DOE 2011) for the 2011 sampling event.

Figure 4 through Figure 8 show the locations of the individual samples collected from the three sites on Amchitka and two areas on Adak. These figures also show the overnight anchorage location of the Research Vessel (R/V) *Norseman* during sampling activities. The R/V *Norseman* provided logistical support during the 2011 biological sampling event. As set forth in the biological Sampling Plan (DOE 2011), each sampling location consists of two separate areas—the shoreline transect and the 2-mile limit. For each sampling location, the shoreline transect extends from the shoreline to approximately 1,000 feet into the ocean and for approximately 3 miles along the shoreline. This 3-mile transect is broken into three separate transects, each approximately 1 mile in length. The shoreline transect is where the divers collected the biological species identified in the Sampling Plan as well as marine sediment. Sampling personnel working from the ship also employed hook-and-line fishing for fish in the shoreline transects. In addition, the terrestrial sampling team worked along the shoreline transects to collect littoral zone samples of algae.

In addition to the three transects at each of the five sites, a fourth transect extending 2 miles away from the shoreline at each of the five sites was employed. The 2-mile limit extended 2 miles into the ocean from the shoreline and was not divided into smaller transects. Sampling personnel at the 2-mile limit employed hook-and-line fishing to collect samples of rockfish, greenling, and/or Irish lords, halibut, and Pacific cod from the fantail of the R/V *Norseman*.

As depicted in Figure 4 through Figure 6, actual sample collection locations from the three areas on Amchitka conformed reasonably well to the sampling locations proposed in the Sampling Plan. However, the geographic features of Adak—a rugged coastline deeply indented by fiords, and coastline erosion that has created imposing cliffs as much as 2,500 feet above sea level—prevented access to some of the proposed sampling locations. As a result, each of the three transects along both the north and south sides of Adak were more spread out along the island's coastline, as shown in Figure 7 and Figure 8. Coordinates of sampling locations were obtained from the GPS units managed by the individual sampling teams. In some instances the coordinates mark the beginning and end of the transect, not each individual location where multiple samples of the same species were collected. Several individual samples may have been picked up at various locations along the same transect. For the final location to be depicted on the figure, either the beginning or the end transect location was chosen as the location placed on the figure for that composite sample.

Figure 9 shows the locations where seawater samples were collected off the coastline of the Cannikin site. The majority of the samples were collected from the deck of the R/V *Ocean Pioneer* during the vessel's support of the terrestrial inspection of the seven earthen caps on Amchitka. The seawater samples that were closer into the shoreline and not easily accessible by the larger R/V *Ocean Pioneer* were collected from the smaller R/V *Norseman* and from skiffs.

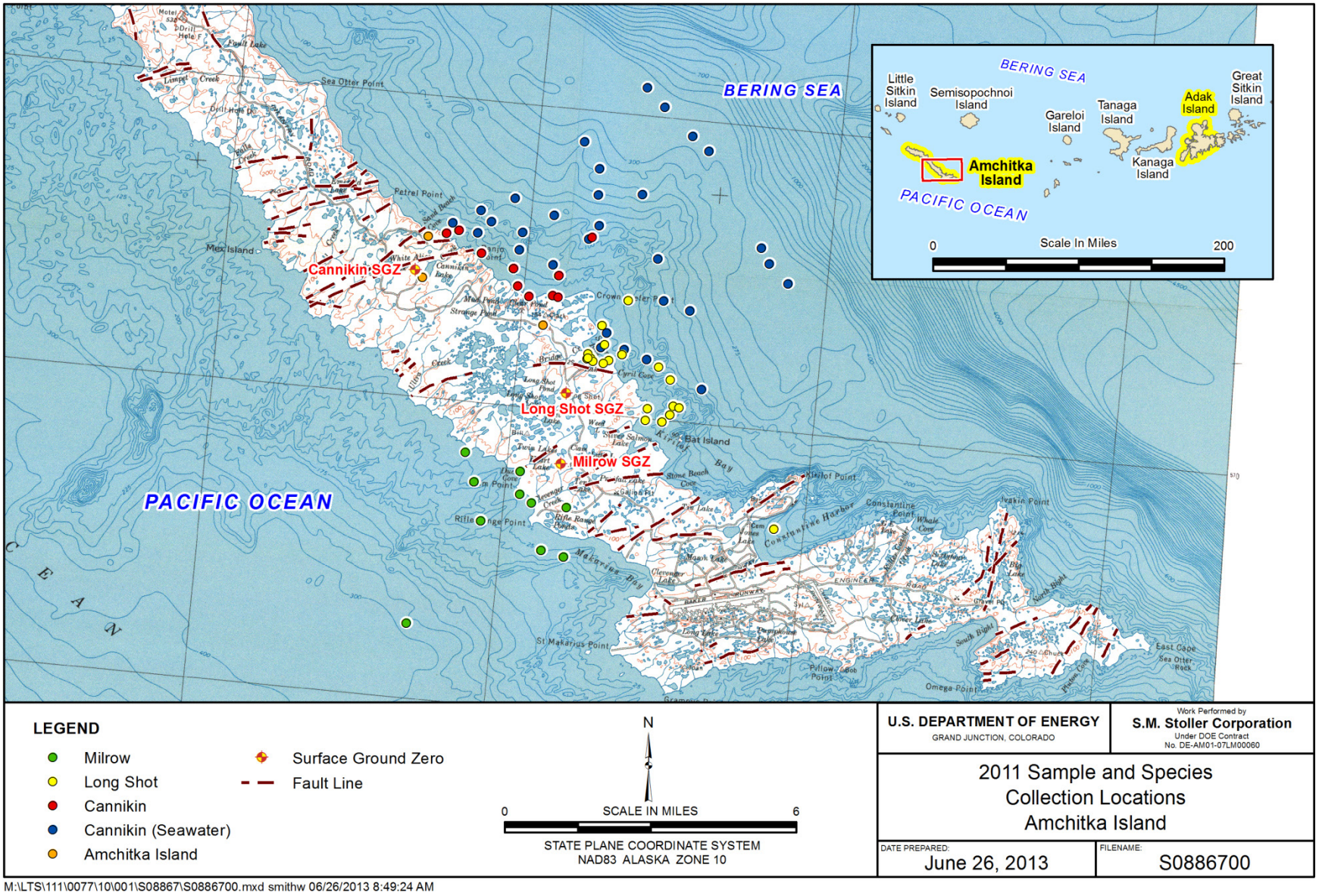

Figure 2. Amchitka Island Sample Locations

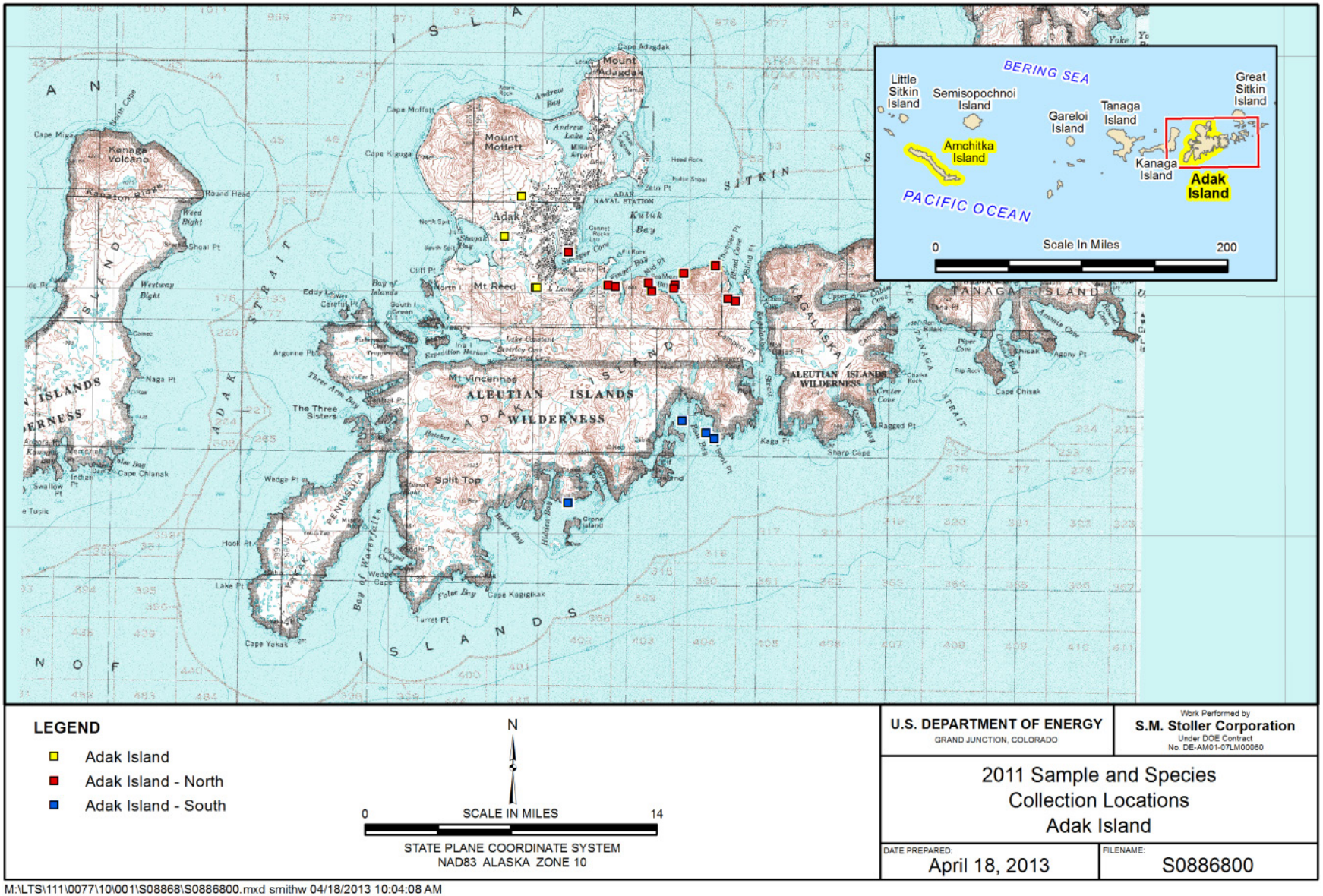

Figure 3. Adak Island Sample Locations

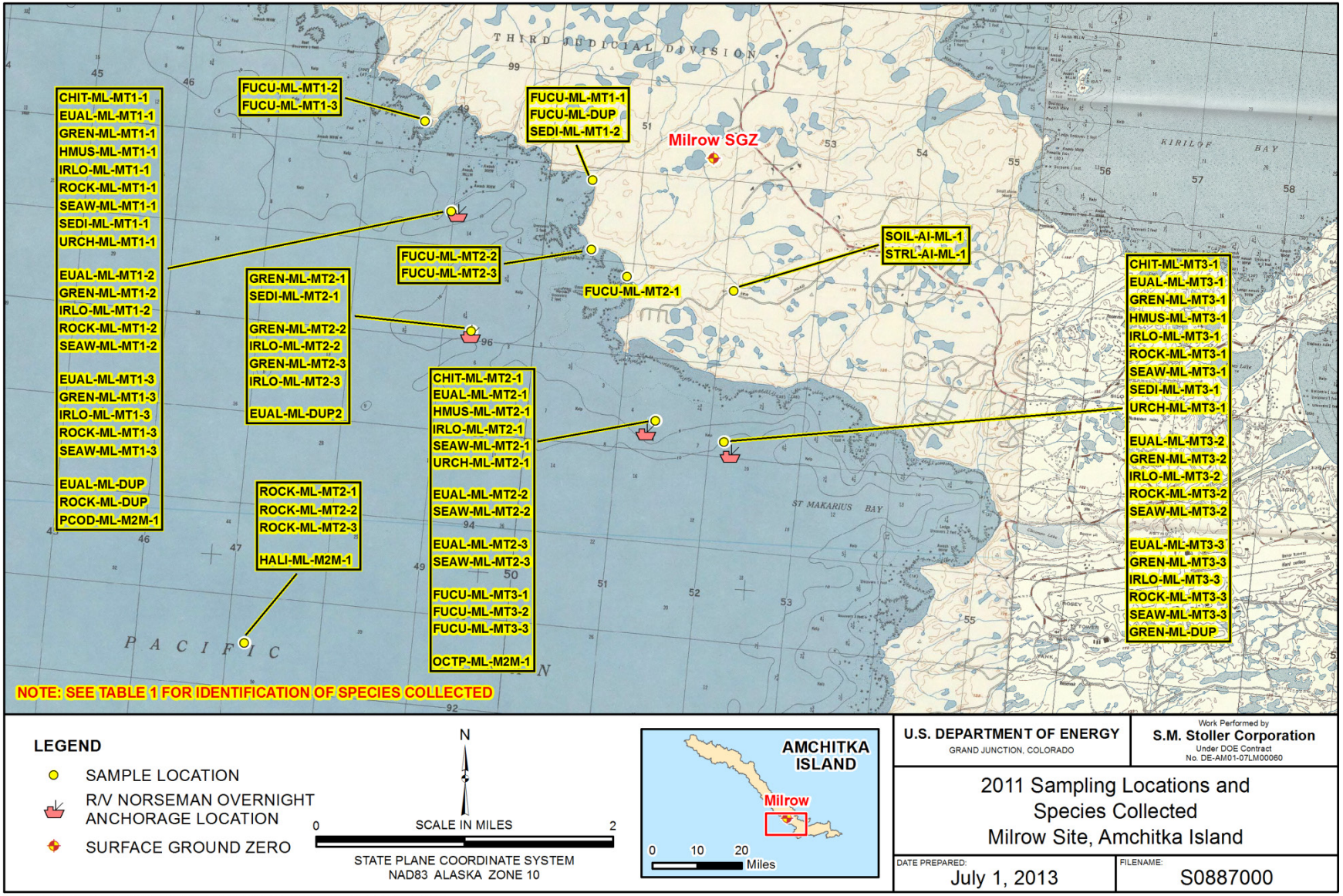

Figure 4. Milrow Sample Locations

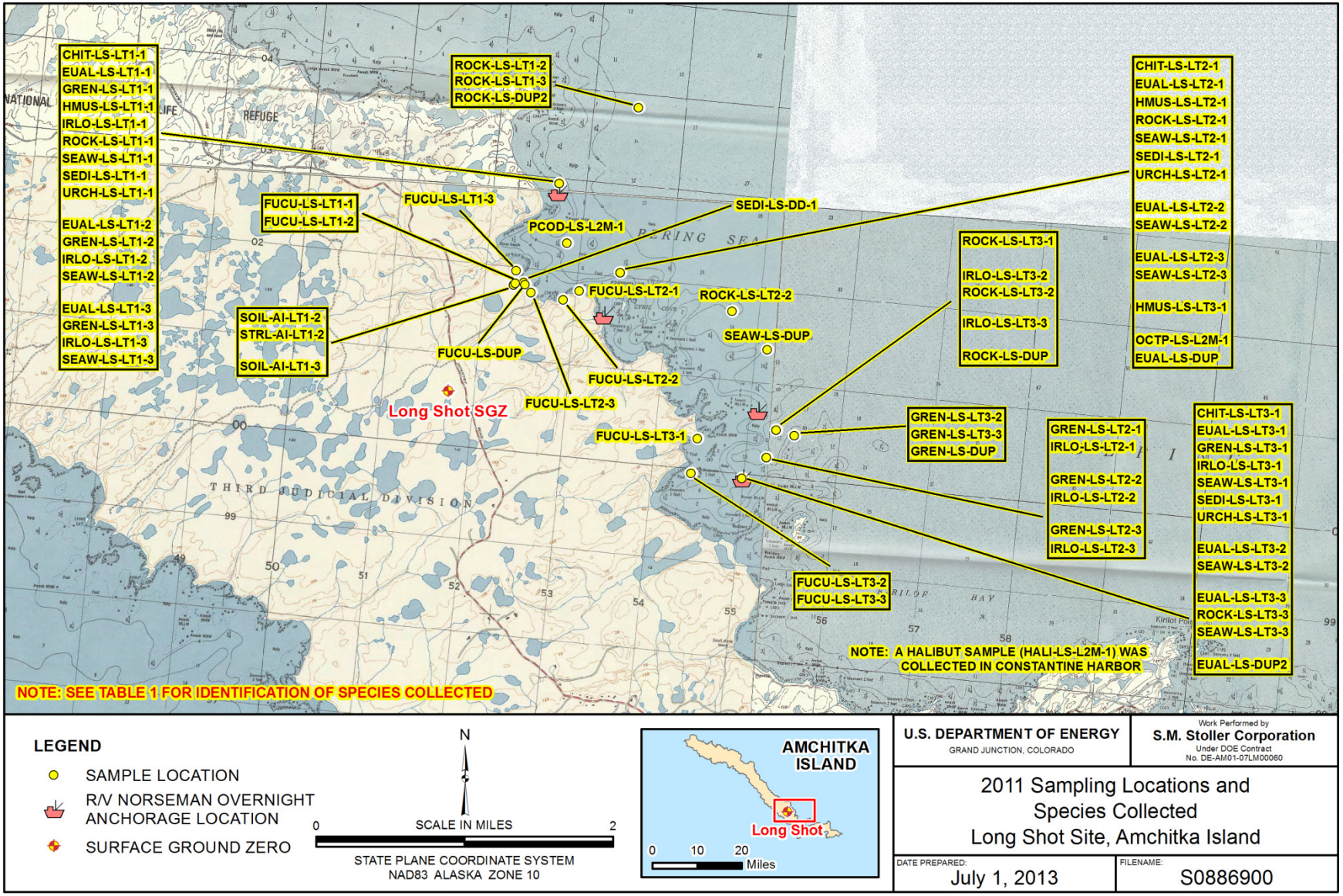

Figure 5. Long Shot Sample Locations

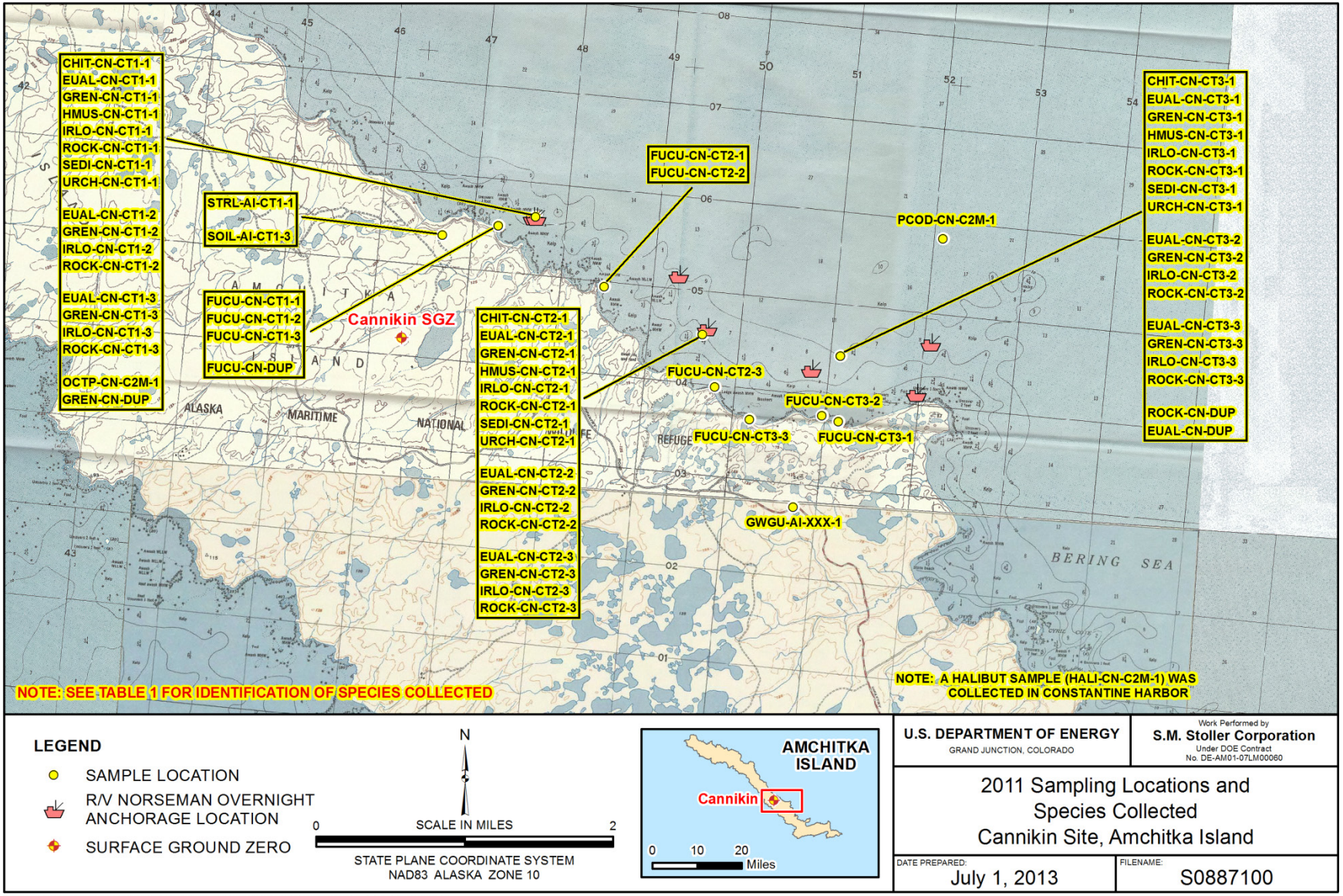

Figure 6. Cannikin Sample Locations

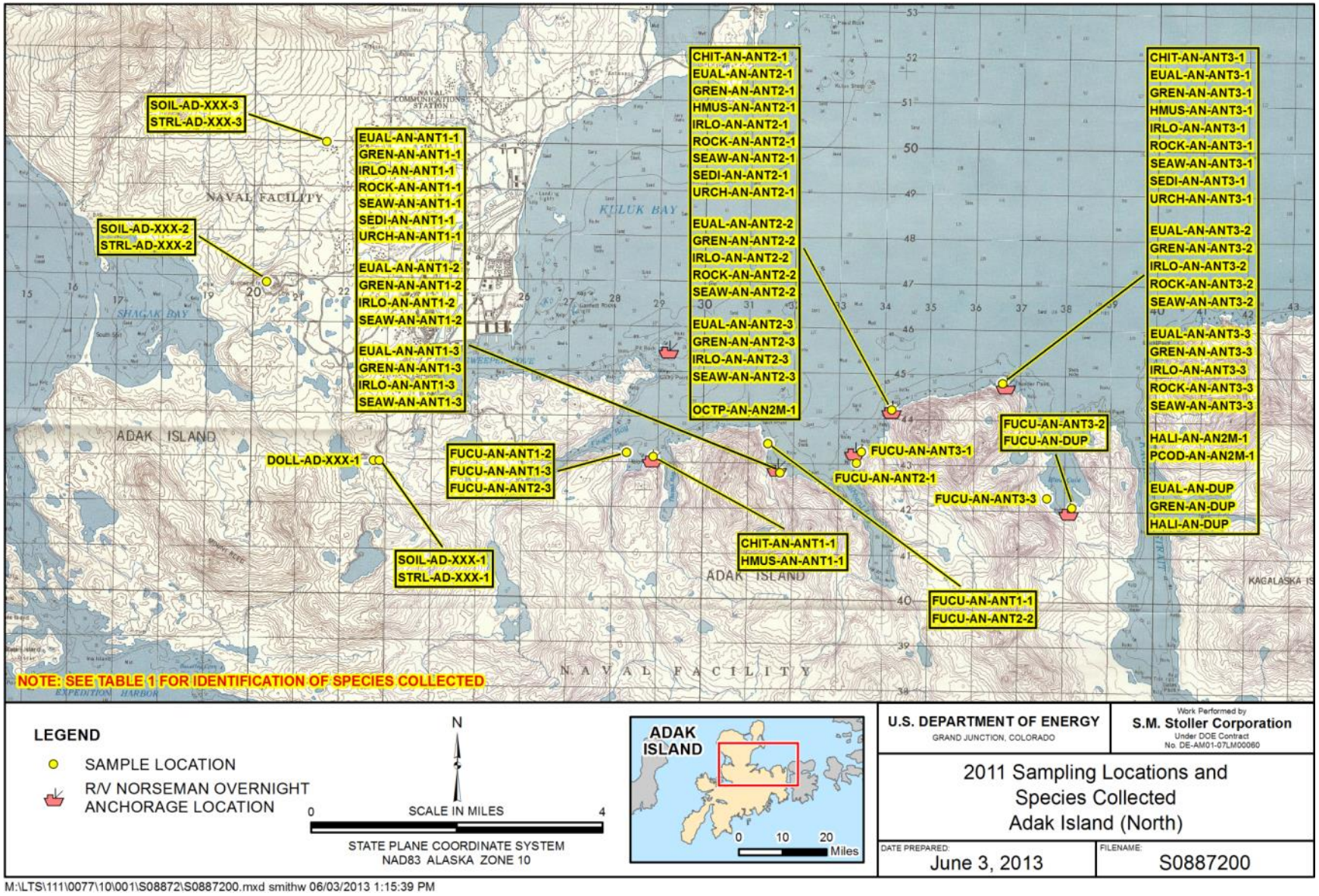

Figure 7. Adak North Sample Locations

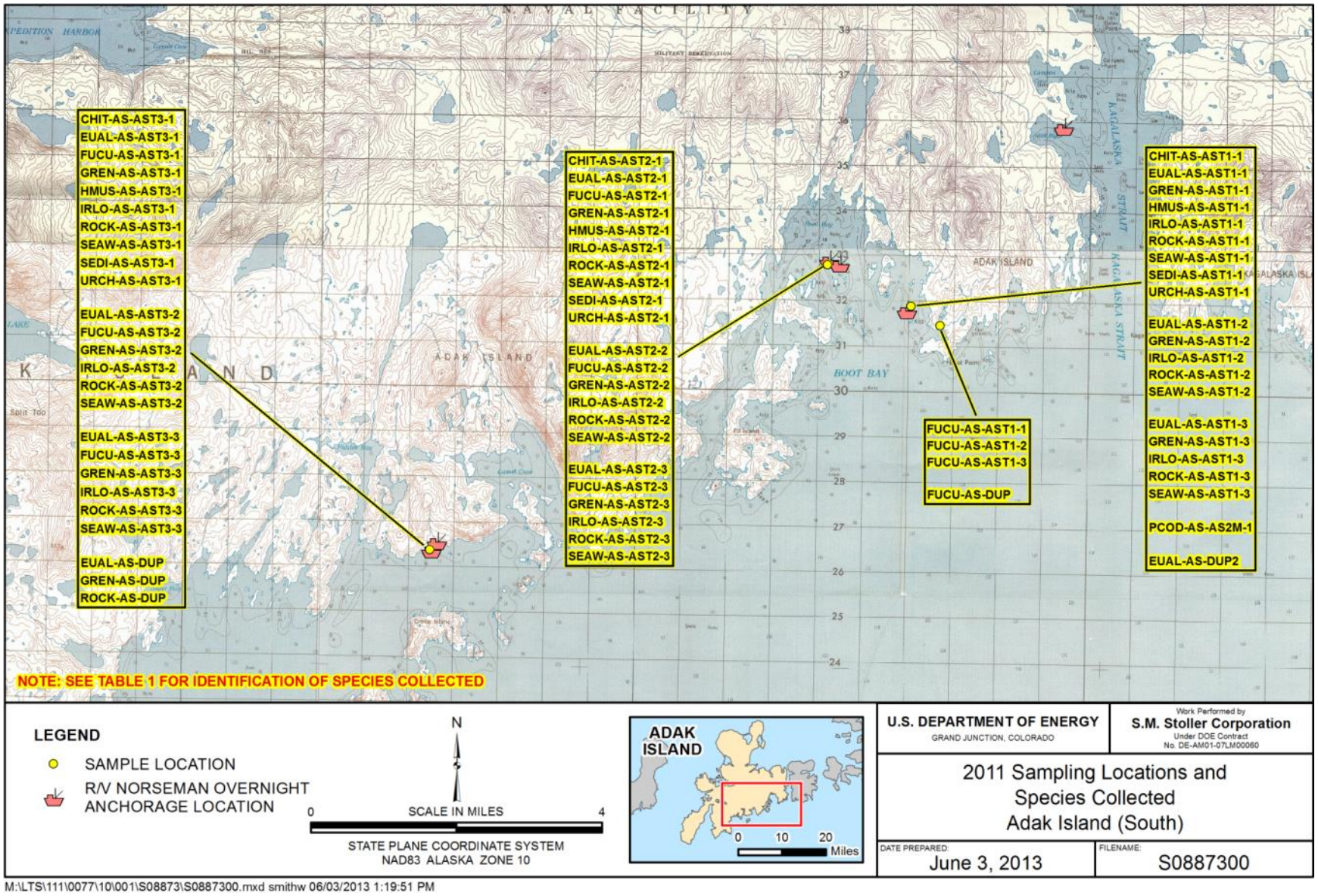

Figure 8. Adak South Sample Locations

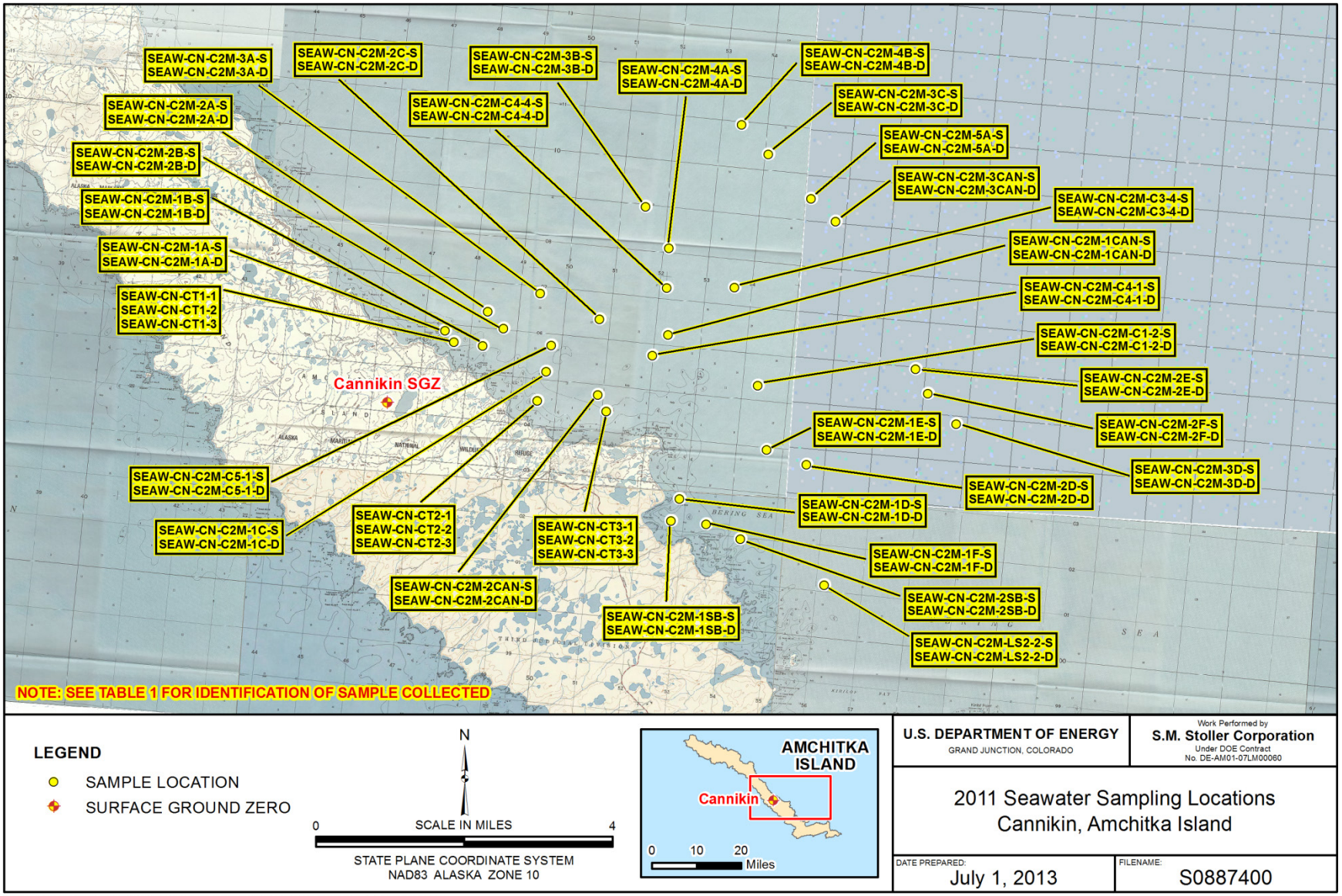

Figure 9. Cannikin Seawater Sample Locations

Additional seawater samples were collected by divers within 1 meter of the seabed off the coastlines of Cannikin, Long Shot, and Milrow sites, as well as the northeast and southeast coastlines of Adak. Divers also collected marine sediment from the seabed from these same general areas.

Finally, sampling personnel collected gull eggs and reindeer lichen and soil beneath the lichen at random locations across both islands. No gull eggs were collected from Adak Island because either the eggs had already hatched or local island residents had collected them.

3.2 Sample Types

Results of biota sampling conducted by CRESP in 2004 indicate that concentrations of target radionuclides in biota (including subsistence- and commercial-catch species) are sufficiently low that the species are safe for human consumption (CRESP 2005), and the CRESP data do not suggest that radionuclides in biota collected from Amchitka are attributable to the Amchitka test shots. Subsistence- and commercial-catch species near Amchitka continue to be harvested for consumption; therefore, the species that are likely to be a food source were targeted for sampling in 2011 to verify that these species continue to be safe to eat. Reindeer lichen was sampled because it is a good indicator species for the uptake of ^{137}Cs in the local environment.

The following biological species were selected for sampling during 2011. Appendix A provides pictures of these species.

- Dragon kelp (*Eualaria fistulosa*),
- Rockweed (*Fucus distichus*),
- Reindeer lichen (*Cladina* reindeer lichen),
- Gumboot or Pacific chiton (*Cryptochiton stelleri*),
- Horse mussel (*Modiolus modiolus*),
- Sea urchin(*Strongylocentrotus polyacanthus*),
- Rockfish (*Sebastes melanops and S. cilatus*),
- Irish lord (*Hemilepidotus jordani and H. hemilepidotus),*
- Rock greenling (*Hexagrammos lagocephalus*),
- Pacific halibut (*Hippoglossus stenolepis*),
- Pacific cod (*Gadus macrocephalus*),
- North Pacific giant octopus (*Enteroctopus dofleini*),
- Dolly Varden (*Salvelinus malma*), and
- Glaucous-winged gull (*Larus glaucescens*) eggs.

The abbreviated sample names in Figure 4 through Figure 8 can be referenced to the following standard labeling system for all the samples collected:

[*Species or sample material*]-[*Site Location*]-[*Transect Location*]-[*Sample Number*]

Table 1 shows the labeling system that was used for sample identification.

Table 1. Labeling System

Species/Media to be Sampled	Species/Media Identification
Dragon kelp	EUAL
Rockweed	FUCU
Reindeer lichen	STRL
Chiton	CHIT
Horse mussel	HMUS
Blue mussel	BMUS
Sea urchin	URCH
Rockfish	ROCK
Red or yellow Irish lord	ILOR
Rock greenling	GREN
Halibut	HALI
Pacific cod	PCOD
Octopus	OCTP
Dolly Varden	DOLL
Glaucous-winged gull eggs	GWGU
Seawater	SEAW
Marine sediment	SEDI
Soil	SOIL
Site Location	**Location Identifier**
Amchitka Island	AI
Adak Island	AD
Cannikin	CN
Long Shot	LS
Milrow	ML
Adak, North	AN
Adak, South	AS
Transect Location	**Transect Identifier**
Cannikin	CT1, CT2, CT3, and C2M
Long Shot	LT1, LT2, LT3, and L2M
Milrow	MT1, MT2, MT3, and M2M
Adak, North	ANT1, ANT2, ANT3, and AN2M
Adak, South	AST1, AST2, AST3, and AS2M
Sample Number	
Sample Number	1–3

3.3 Sample Collection and Preparation

Sampling began the week of June 19, 2011, with the arrival of the inspection and terrestrial sampling teams on Amchitka Island. The terrestrial sampling team consisted of Doug Dasher (ADEC), Karen Pletnikoff (APIA), Michael McCoy (APIA), Pauline Melovidov (APIA), Jason Nguyen (LM), Lauren Goodknight (S.M. Stoller Corporation [Stoller]), and Mary Picel (ANL). Doug and Karen were the co-leads directing the terrestrial sampling efforts. Rockweed, reindeer lichen, the soil beneath the lichen, gull eggs, and Dolly Varden were collected from the designated sampling areas along the shoreline where pedestrian access was possible (rockweed), Cannikin Lake (Dolly Varden), and opportunistically (gull eggs, reindeer lichen, and soil beneath the lichen) across Amchitka. The Amchitka terrestrial sampling was completed by noon on Friday, June 24, 2011. The majority of the seawater samples were collected from the deck of the R/V *Ocean Pioneer* on the afternoon and evening of Friday, June 24, 2011. The *Ocean Pioneer*

arrived back in Adak on Sunday, June 26, and all samples were shipped out on Alaska Airlines to LLNL, the Tritium Laboratory at the University of Miami Rosenstiel School of Marine and Atmospheric Science in Miami, Florida, or the University of Alaska Anchorage that same day.

The terrestrial sampling on Adak Island began Sunday, June 26, and was completed on Wednesday, June 29. The samplers collected the lichen and soil beneath the lichen and collected Dolly Varden from lakes but were unable to collect samples of either rockweed or gull eggs on Adak. There are no roads to the island's coastline and thus no access to the proposed sampling locations. Also, apparently local residents collect gull eggs for personal consumption, and the sampling team was unable to locate any. All samples collected on Adak were shipped out on Alaska Airlines to LLNL on Thursday, June 30.

The R/V *Norseman*, the vessel chartered for the biological sampling, arrived at Sweepers Cove pier, Adak Island, on Wednesday, June 29. The dive team arrived via Alaska Airlines the following day. The scientific dive team from UAF included divemaster Stephen Jewett and divers Heloise Chenolet, Max Hoberg, Jared Weems, and Shona Snater. Also along as part of UAF's dive team were Piotr Kuklinski from the Institute of Oceanology Polish Academy of Sciences, David Scheel from the Alaska Pacific University, and a contract diver, Roger Clark. The scientific team aboard the R/V *Norseman* included Mark Kautsky, LM's site manager, Paul Darr, Stoller's project manager, Karen Pletnikoff and Michael McCoy from APIA, Lauren Goodknight, Stoller's sample coordinator, and Marty Dombrowski, Stoller's videographer.

Biological sampling activities began July 1 and continued through July 21. Typically, dive operations occurred twice a day, once in the morning and once in the afternoon. There were three sites containing three transects each on Amchitka Island and two sites containing three transects on Adak Island. As the biological sampling project progressed, the dive teams were usually able to collect enough of all the specimens required from each transect during a period of two dives. The divers were limited to diving to a depth of 65 feet (20 meters); therefore, all samples were collected at depths less than 65 feet. The scientific team fished from the deck of the R/V *Norseman* to collect samples of the larger fish such as the Irish lords, greenlings, black rockfish, dusky rockfish, Pacific cod, and halibut.

With the exception of one rockfish duplicate from Milrow, all species proposed to be collected from Amchitka Island were collected. All species proposed to be collected from Adak Island were collected with the exception of one halibut and an octopus from south Adak Island and four rockfish from north Adak Island (one each from the three transects and a duplicate). As noted, no gull eggs were collected from Adak Island.

Where pedestrian access to rockweed was not possible on Amchitka and Adak, the biological sampling team of Karen Pletnikoff and Michael McCoy collected the rockweed samples from a skiff at all the remaining transect locations on both islands during times when the divers were not diving.

The remaining seawater samples off the coastline of the Cannikin site were collected from the deck of the R/V *Norseman* or from its skiff.

Table 2 shows individual species collected, the number of samples of each species collected, and the average weight of the individual, or composited, prepared sample.

Table 2. Sample Collection Information

Species	Sample Wet Weight Needed (kg)	Average Weight per Sample (kg)	Total Number of Individual Samples per Species	Total Number of Samples[a]
Ocean Sampling				
Dragon kelp	5	5.4	55	55[b]
Gumboot chiton	0.5	0.59	40	15
Horse mussel	0.1	0.48	164	15
Sea urchin	0.5	0.62	92	15
Octopus	5	3.56	8	4
Black or dusky rockfish	0.5	1.04	47	46
Rock greenling	0.5	0.62	51	50
Irish lord	0.5	0.55	60	45
Halibut	5	5.96	5	5
Pacific cod	5	5.5	11	5
Seawater (diver-collected)[c]	NA	NA	NA	50
Seawater (collected from vessel)[c]	NA	NA	NA	66
Marine sediment	NA	NA	NA	18
Terrestrial Sampling				
Rockweed	5	5.53	50	50
Reindeer lichen	0.5	0.65	12	12[d]
Soil beneath lichen	NA	0.45	NA	12[e]
Gull eggs	2	1.2	12	1
Dolly Varden	3	0.89	34	2
Total number of samples				**466**

kg = kilogram
NA = Not applicable
[a] Some samples were composited.
[b] 5 duplicate samples sent to UAF.
[c] Samples sent to University of Miami.
[d] 6 duplicate samples sent to UAF.
[e] 6 duplicate samples sent to UAF.

When the dive team and samples were onboard the R/V *Norseman* after each dive, sample preparation began. With the help of members from the dive team, R/V *Norseman* crew, and certain members of the scientific team, samples were weighed, bagged, and labeled. Table 3 summarizes sampling and handling procedures for each species collected. Appendix B provides length and weight of samples collected. Once sample preparation was finished, all biological samples were frozen, and the seawater samples and sediment samples were stored in a cooler in the ship's hold.

Upon return of the R/V *Norseman* to the pier at Sweepers Cove on Thursday, July 21, all samples were placed into iced coolers with a completed chain-of-custody (COC) form, delivered to the airport, and shipped on Alaska Airlines to LLNL, the Tritium Laboratory at the University

of Miami Rosenstiel School of Marine and Atmospheric Science in Miami, or the University of Alaska Anchorage that same day.

3.4 Sample Chain-of-Custody

The purpose of the COC was to provide documentation of the control and transfer of samples from the time of sample collection through shipping and receipt by the analytical laboratory. The COC form and sample labels were generated by the Stoller laboratory coordinator.

When the samples were physically transferred to the commercial carrier, the "Relinquisher" signed the COC forms and included the date and time of sample transfer. Employees of the commercial carrier were not required to sign the forms. The laboratory signed the "Received" blocks on the COC forms with the date and time the samples were received.

Each cooler was banded to ensure the contents were secure and the coolers would not open during transit. To ensure the integrity of the sample, custody seals were attached to the cooler openings. The original COC form was placed in a plastic zip bag and included inside one of the coolers being sent to the laboratory.

An example of a COC form is shown in Appendix C. The COC form contained the following information:

- Ticket number
- Data and time sample was collected
- Site
- Location where sample was collected
- Type and number of containers
- Preservative used on the sample
- Sample matrix
- Type of sample (composite or grab)
- Whether the sample was filtered or unfiltered
- Analyses requested

Table 3. Collection and Preparation of Samples

Species	Where	Collected By	Collection Procedure	Onboard Ship Handling/Storage
Ocean Sampling				
Dragon kelp	Nearshore subtidal	Dive team	For each transect, three individual samples weighing approximately 5 kilograms (kg) each, or three composited samples if necessary, were collected. The holdfast was not collected. A duplicate sample also was collected from one of the three transects. The duplicate sample was split with UAF.	Sample bagging and labeling was performed onboard the vessel. The sample was double bagged and labeled twice with a unique location identification number (once inside the bag and once on the outside) and frozen. The wet weight of each sample collected was recorded in the database.
Chiton	Nearshore subtidal	Dive team	For each transect, whole chiton was collected and a total combined weight of approximately 0.5 kg per sample was obtained.	Labeling and packaging as above.
Horse mussel	Nearshore subtidal	Dive team	For each transect, the entire horse mussel was collected and composited; a total combined weight of approximately 0.5 kg per sample was obtained. Approximately 11 horse mussels were collected per sample.	Labeling and packaging as above.
Sea urchin	Nearshore subtidal	Dive team	For each transect, the entire sea urchin was collected and composited, requiring approximately six specimens per sample.	For each composite sample, the wet weight of individual urchins was measured, and the total weight of the sample was calculated. Wide-mouth, 64-ounce (oz) high-density polyethylene (HDPE) containers were used to package the sea urchins. Labels were attached to the containers, and then the containers were placed in the freezer.
Octopus	Nearshore subtidal	Dive team	Divers collected specimens of adequate size (if possible) within the 2-mile zone.	The total wet weight of the octopus was measured and recorded in the database. Prior to the octopuses' arms being severed and discarded, the octopus was humanely euthanized by placing in a freezer. The remaining portion was bagged, packaged, and labeled the same as for dragon kelp.
Rockfish, rock greenling, and Irish lord	Nearshore subtidal and offshore	Nearshore collected by dive team. Offshore collected by hook-and-line crew.	For each transect, one to two specimens of each species and each transect were collected.	Each fish had its taxonomic identification checked, sex determined (if possible), length measured (total or fork length, dependent on the fish species) in centimeters, and weight recorded in grams. Labeling and packaging same as for dragon kelp.
Halibut	Offshore	Hook-and-line crew	One fish per sample zone, not transect location, was caught.	Same as for dragon kelp.

Table 3 (continued). Collection and Preparation of Samples

Species	Where	Collected By	Collection Procedure	Onboard Ship Handling/Storage
Pacific cod	Offshore	Hook-and-line crew	Up to four fish were caught per sample zone, not transect location.	Same as dragon kelp.
Marine sediments	Nearshore sampling at each transect (if possible)	Dive team	Wherever soft substrate was encountered, one sample of sediment from each transect was collected. Samples were collected in 1–liter (L) HDPE bottles.	Sample labels were attached to each bottle, and the lids were wrapped with tape. The samples were kept cool.
Seawater	At each transect and at additional specified locations off Cannikin shoreline	Dive team and others from aboard ship	From each transect, divers collected three samples of seawater from approximately one meter above the ocean substrate. The divers used 1 L HDPE bottles for sample collection.	Same as marine sediments. The samples were kept cool.
Terrestrial Sampling				
Rockweed	Intertidal	Land crew	For each transect, three individual samples weighing approximately 5 kg each of the whole plants were collected and composited.	Sample bagging and labeling was the same as for dragon kelp.
Reindeer lichen	On-island	Land crew	Samples of reindeer lichen were collected by hand to allow separation of any associated debris or vascular plants. At each sampling location, three sample sets, each set having a wet weight of 0.5 kg, were composited into plastic bags. Soil beneath the lichen was also collected and placed into one 32 oz HDPE plastic container. Repeat the above for sample split with UAF.	Once the samples are returned onboard, the bags were placed within a larger bag. Field photos of the lichens were taken for identification. Once the necessary collection weight was reached and bagged, the sample bag was labeled twice with a unique location identification number (once inside the bag and once on the outside) and frozen. Samples of lichen and soil beneath the lichen were split with UAF.
Glaucous-winged gull eggs	On-island	Land crew	Sampling personnel located gull nests on Amchitka, and eggs were placed in a 64 oz HDPE container and transported back to the ship. The exact location of each collection site was obtained using global positioning system.	The weight of the whole egg collected from each location was recorded in the database. The container was labeled and frozen.
Dolly Varden	Cannikin Lake (also at Adak, if possible)	Hook-and-line crew	Fish were collected from Cannikin Lake and a lake on Adak using the hook-and-line process.	The fish had taxonomic identification checked, sex determined, length measured, and weight recorded. Sample bagging and labeling was the same as for dragon kelp.

4.0 Laboratory Analysis, Quality Assurance, and Data Validation Procedures

4.1 Target Radionuclides and Selection Criteria for Methods of Analysis

Previous studies conducted by CRESP on biological aspects of potential radionuclide exposure in the Amchitka marine environment provided helpful insight into the likely range of observable radionuclide concentrations in a range of biological species. The aim of the 2011 sampling event was to optimize the design of the sampling and analysis program to help validate these measurements and provide a basis for analyzing future trends. A strategic planning process was laid out with DQOs that identified where and when to collect samples, how many samples needed to be collected (within practical limitations), and which measurement techniques (and at what cost) might be best suited to help reduce uncertainties in assessing food safety, fill any information gaps, and provide adequate detection sensitivity to support future statistical trending analyses. LLNL scientists also cited the advantages of developing isotope-specific data based on mass spectrometry to help characterize inputs from different potential source terms. During the post-planning phase of the 2011 sampling event, some consideration was also given to the possible complexities in interpreting background activity concentrations of target radionuclides due to atmospheric releases from the Fukushima Dai-ichi facility. A decision was therefore made to screen selected samples of soil and lichen for the presence of ^{134}Cs by gamma spectrometry.

Table 4 shows a list of recommended radiometric measurement techniques for analysis of target isotopes with nominal detection limits. The only deployable method outlined in the Sampling Plan for analysis of marine sediment, soil, and lichen was high-resolution gamma spectrometry. All other biological samples were to be analyzed for ^{137}Cs, ^{234}U, ^{235}U, ^{238}U, ^{239}Pu, ^{240}Pu, and ^{241}Am.

Table 4. Techniques for Measurement of Target Radionuclide

Analyte	Analytical Technique	Minimal Detectable Activity (pCi)[a]
^{137}Cs	Gas Proportional Beta Spectrometry[b]	0.3
^{234}U	Quadrupole Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	0.003
^{235}U	Quadrupole Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	2×10^{-6}
^{238}U	Quadrupole Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	2×10^{-7}
^{239}Pu	Quadrupole Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	0.01
^{240}Pu	Quadrupole Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	0.02
^{241}Am	Alpha Spectrometry	0.03–0.06

[a] pCi = picocuries
[b] Gamma spectrometry to be employed for reindeer lichen, marine sediment, and soil

4.2 Sample Laboratory Preparation Methods

Analytical results of previous sampling events showed that background activity concentrations of selected target radionuclides in the vicinity of Amchitka Island were at or below levels of detection. Planning for LM's 2011 sampling event included placing emphasis on collecting an adequate number and larger-sized samples to support future trending analysis. The mean sample dry weight of material for analysis of target radionuclides ranged from 40 grams (g) for horse mussel to well over 1,000 g for halibut, Pacific cod, dragon kelp, and rockweed. To reduce the sample mass to a more manageable size for wet chemistry, it was necessary to reduce the volume of material by combustion in a muffle furnace. Prior to combustion, the biological samples were dried by lyophilization in an industrial-size freezer. A summary of the laboratory preparation methods, including the initial sample processing and preparation procedures as well as sample combustion procedures, is included as Appendix D. Appendix E is the summary of individual samples' wet, dry, and ash weights.

4.3 Analytical Methods

The bulk of the ^{137}Cs analyses were performed at LLNL using gas proportional beta spectrometry. The remaining samples, including marine sediment, soil, and reindeer lichen, were analyzed by high-resolution gamma spectrometry. ^{241}Am measurements were performed at LLNL using alpha spectrometry. Plutonium isotope analyses were performed at LLNL on a Thermo Electron XSeries quadrupole inductively coupled plasma mass spectrometer (ICP-MS) fitted with a concentric nebulizer. Uranium isotope analyses were performed at LLNL on a Thermo Electron XSeries quadrupole ICP-MS fitted with a SeaSpray nebulizer. Tritium analysis was performed by the Tritium Laboratory at the University of Miami Rosenstiel School of Marine and Atmospheric Science using the enriched method and low-level gas proportional counters.

4.4 Quality Assurance and Data Validation

This section is a summary of the quality assurance and data validation process used for the radiometric analyses. Appendix F provides a detailed discussion of the process. The beta spectrometry system was calibrated using stock solutions of ^{137}Cs prepared by serial dilution of a Standard Reference Material 4233D supplied by the National Institute of Science and Technology. Data validation procedures included the analysis of archive water samples obtained under the DOE Mixed Analyte Performance Evaluation Program.

For ^{241}Am, a conservative estimate of the minimum detectable concentration (MDC) was calculated based on a Stapleton approximation (adopted from EPA 2004) by using the mean background count rate for the alpha spectrometry system rather than a mean blank count rate. This approximation was made because a series of 10 replicate blank measurements all returned a zero count rate in the specific region of interest for ^{241}Am. With this assumption, the largest number of ^{241}Am counts likely to be observed in a background count was 2, yielding an estimated MDC for measurement of ^{241}Am by alpha spectrometry of 0.01 picocurie (pCi).

The minimal detectable signal of the ICP-MS instrument for plutonium isotope measurements was estimated in a fashion similar to that described for uranium isotopes using procedures adopted from EPA (2004). Based on the standard deviation of 10 reported replicate blank

measurements, the MDC, defined by units of activity for measurement of ^{239}Pu and ^{240}Pu by ICP-MS, is estimated to be around 0.03 and 0.02 pCi, respectively.

The minimal detectable signal of the ICP-MS instrument for uranium isotope measurements was defined by the standard deviation of 10 reported replicate blank measurements based on a noncentral *t*-distribution function, and assuming the variance of the signal between measurements was approximately constant (using procedures adopted from EPA 2004).

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5.0 Sampling Results

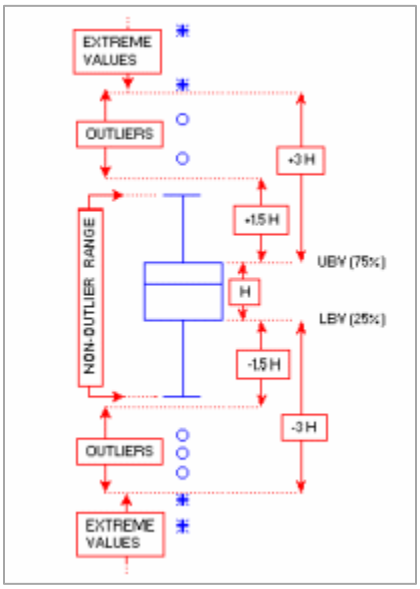
5.1 Database Discussion

LM's Amchitka and Adak Islands' environmental data are stored in the LM environmental database known as SEEPRo (Site Environmental Evaluation for Projects). The Environmental Support Services Data Management group is responsible for ensuring that LM environmental data are captured, stored, organized, maintained, and preserved in reliable and accurate condition so that the data are available for use by other LM organizations.

5.2 Data Presentation

The box plots (also called box-and-whisker plots) in Figure 10 through Figure 21 show the distributions of results in samples collected from Amchitka and Adak islands, along with corresponding MDCs. These plots depict the median (central line bisecting the box), the lower and upper quartiles, the non-outlier range, and outliers. For each species, the corresponding number of samples collected from Amchitka and Adak islands is listed below the plots. With the exception of extreme outlier U-flagged results (undetected; values were below the MDC) and one horse mussel sample HMUS-LS-LT3-1 from Amchitka, box plots were generated using all data, including U-flagged results. To facilitate interpretation of the box plots, corresponding tables in Section 6 list detection frequencies and relevant summary statistics.

In the following figures, although all plot components—medians, lower and upper quartiles, non-outlier raw data, and outliers and extremes—are identified in the legends; the following introductory schematic provides more detail.



Source: Statistica 64, Version 10 Electronic Manual (StatSoft Inc.)

For this analysis, a data point is considered an outlier if the following conditions hold:

Data point value > UBV + 1.5(UBV – LBV) *or* data point value < LBV – 1.5(UBV – LBV)

where:

UBV is the upper value of the box in the box plot (75th percentile or upper quartile)
LBV is the lower value of the box in the box plot (25th percentile or lower quartile)

Similarly, a data point is deemed to be an extreme value if:

Data point value > UBV + 3(UBV – LBV) *or* data point value < LBV – 3(UBV – LBV).

5.3 Cesium-137 Isotope

A full listing of individual measurement data for ^{137}Cs in vegetation, marine fauna, marine sediment, and fauna collected during the Amchitka 2011 sampling event is given in Appendix G (Hamilton et al. 2012b). The data are reported in units of picocuries per kilogram (pCi/kg) wet weight for vegetation and fauna and in units of picocuries per kilogram dry weight for marine sediment and soil. All data are decay corrected to the date of sampling. For quick reference, data are sorted according to species type and location/grid. Gamma spectrometry measurements of ^{137}Cs and ^{134}Cs in marine sediment and soil are based on the <2 millimeter particle size fraction.

The ^{137}Cs content of marine vegetation and fauna collected across the Adak and Amchitka sites is shown graphically in Figure 10 and Figure 11. Figure 10 shows ^{137}Cs in selected marine vegetation and fauna and gull eggs. Figure 11 shows ^{137}Cs in Dolly Varden, lichen, soil beneath the lichen, and marine sediment.

The ^{137}Cs content of horse mussel from both sites shown in Figure 10 was highly variable, and excluding data developed for a single sample of gull eggs from Amchitka Island, contained the highest mean activity concentrations of ^{137}Cs at both islands. The mean activity concentrations of ^{137}Cs in horse mussel tissue from the Adak and Amchitka sites were 9.2 and 11.4 pCi/kg wet weight, respectively. This compares with reported levels up to several hundred pCi/kg wet weight in Dolly Varden, and several thousand pCi/kg wet weight in reindeer lichen.

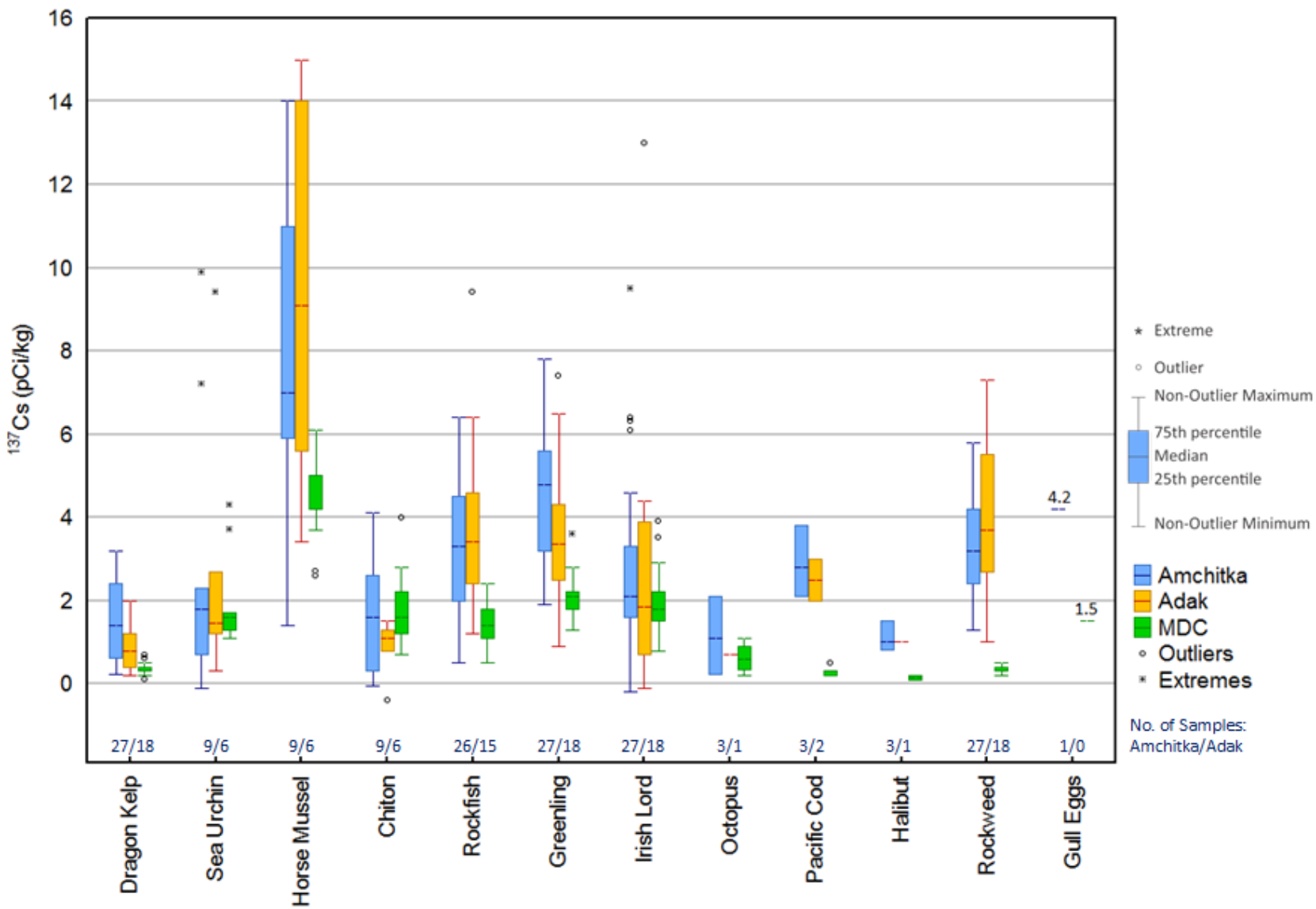


Figure 10. ^{137}Cs in Selected Marine Vegetation, Fauna, and Gull Eggs

Results for Dolly Varden, lichen, soil, and sediment are plotted separately in Figure 11, given much higher ^{137}Cs concentrations in these samples.

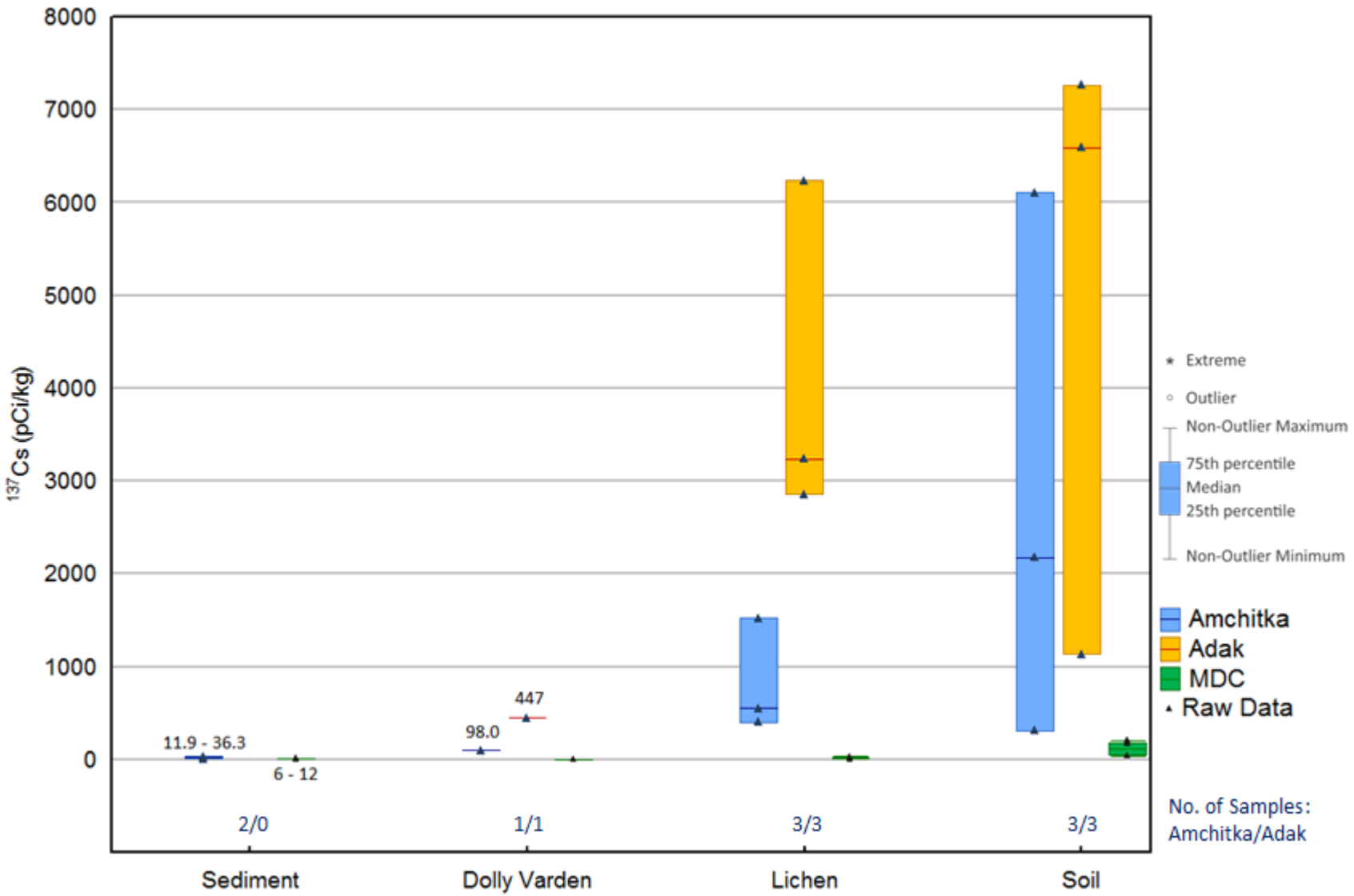


Figure 11. ^{137}Cs in Dolly Varden, Lichen, Soil Beneath the Lichen, and Marine Sediment
Raw data are also plotted, given the small number of samples collected for each of these species/media.

5.4 Americium-241 Isotope

A full listing of individual measurement data for ^{241}Am in vegetation and marine fauna collected during the Amchitka 2011 sampling event is given in Appendix H (after Hamilton et al. 2012d). Data are reported in activity concentration units of picocuries per kilogram wet weight. For quick reference, data are sorted according to species type and location/grid. The results are reported as measured even if the reported value is less than the reported MDC. No weight corrections were made for the presence of sea salts in determining the ^{241}Am content of rockweed and dragon kelp. The ^{241}Am content of vegetation and fauna collected from the Adak and Amchitka sites is shown graphically in Figure 12 and Figure 13. Figure 12 depicts ^{241}Am in selected marine vegetation, fauna, and gull eggs. Figure 13 depicts ^{241}Am in dragon kelp, rockfish, greenling, Irish lord, octopus, and rockweed.

^{241}Am was measured by alpha spectrometry using ion-implanted-silicon charged-particle detectors. The estimated MDC for measurement of ^{241}Am by alpha spectrometry was 0.01 pCi. The mean reported sample measurement MDC for ^{241}Am expressed as activity concentration was 0.008 pCi/kg wet weight. The vast majority of samples analyzed under this sampling event contained ^{241}Am loadings that were at or below the reported MDC. Data also appear to be more highly variable across individual species of fauna. While there are no significant outliers, this may be indicative of the lower quantity of these data compared to the quantities obtained for other radionuclides.

The highest-quality data appear to have been obtained for sea urchin, octopus, and, to a lesser extent, dragon kelp. Few reliable laboratory intercomparison samples are available for performance testing of ^{241}Am at environmental concentrations. Quality assurance measures performed under this sampling event were limited to assessing the reproducibility of the alpha spectrometric measurement by conducting a series of cross counts on different detectors. In this case, the results satisfied internal laboratory data quality requirements within the quantifiable capabilities of the technique.

5.5 Plutonium Isotopes

Full individual measurement data for ^{239}Pu and ^{240}Pu in vegetation and fauna collected during the Amchitka 2011 sampling event are shown in Appendix I (after Hamilton et al. 2012c). The data are reported in units of picocuries per kilogram wet weight. For quick reference, data are sorted according to species type and location/grid. Data are reported as measured even if the reported value is less than the reported MDC. No weight corrections were made for the presence of sea salts in determining the plutonium content of rockweed and dragon kelp.

The ^{239}Pu and ^{240}Pu concentrations of vegetation and fauna collected from the Adak and Amchitka sites are shown graphically in Figure 14 and Figure 15. Figure 14 depicts ^{239}Pu in selected marine vegetation and fauna, gull eggs, and lichen. Figure 15 depicts ^{240}Pu in selected marine vegetation and fauna, gull eggs, and lichen.

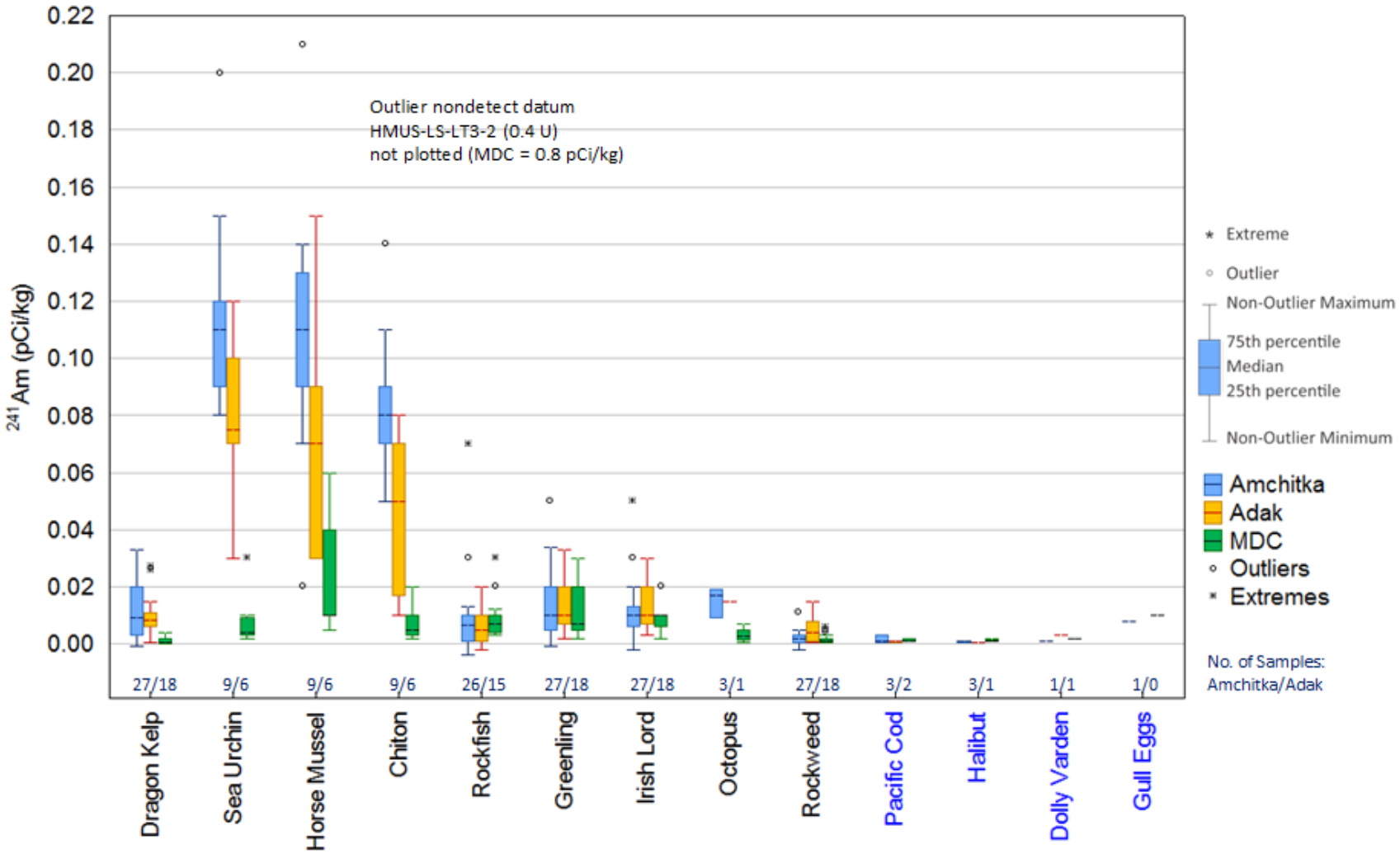


Figure 12. ^{241}Am in Selected Marine Vegetation, Fauna, and Gull Eggs

Species in the rightmost portion of graph (listed in blue font) are those for which all results were less than the MDC. A zoom-view of results for species with the lowest ^{241}Am concentrations is provided Figure 13.

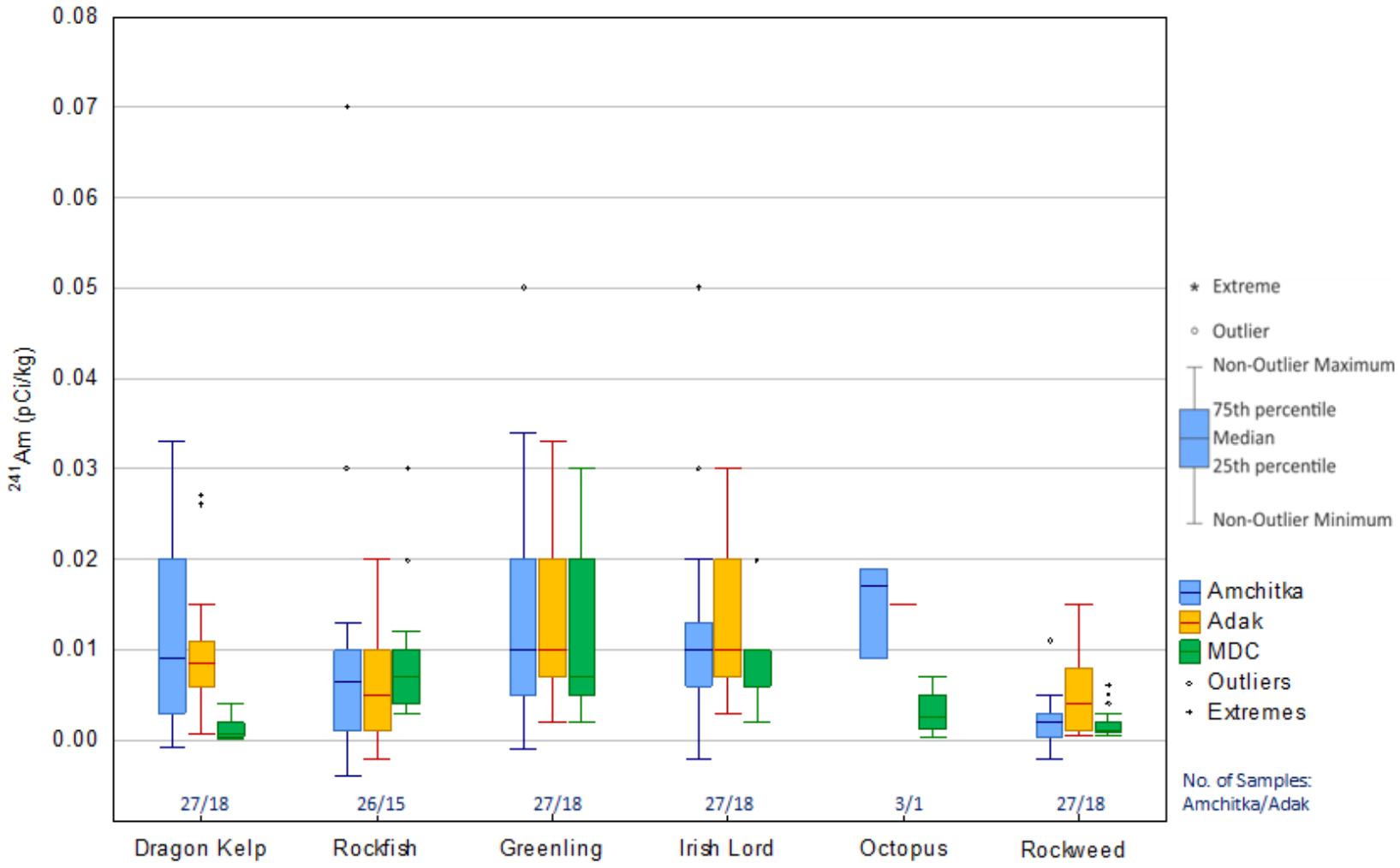


Figure 13. ^{241}Am in Dragon Kelp, Rockfish, Greenling, Irish Lord, Octopus, and Rockweed

Zoom-view of species with the lowest detectable ^{241}Am concentrations in Figure 12. Detection frequencies were low (<20 percent) for rockfish, greenling, and Irish lord. Interisland comparisons are significant only for rockweed.

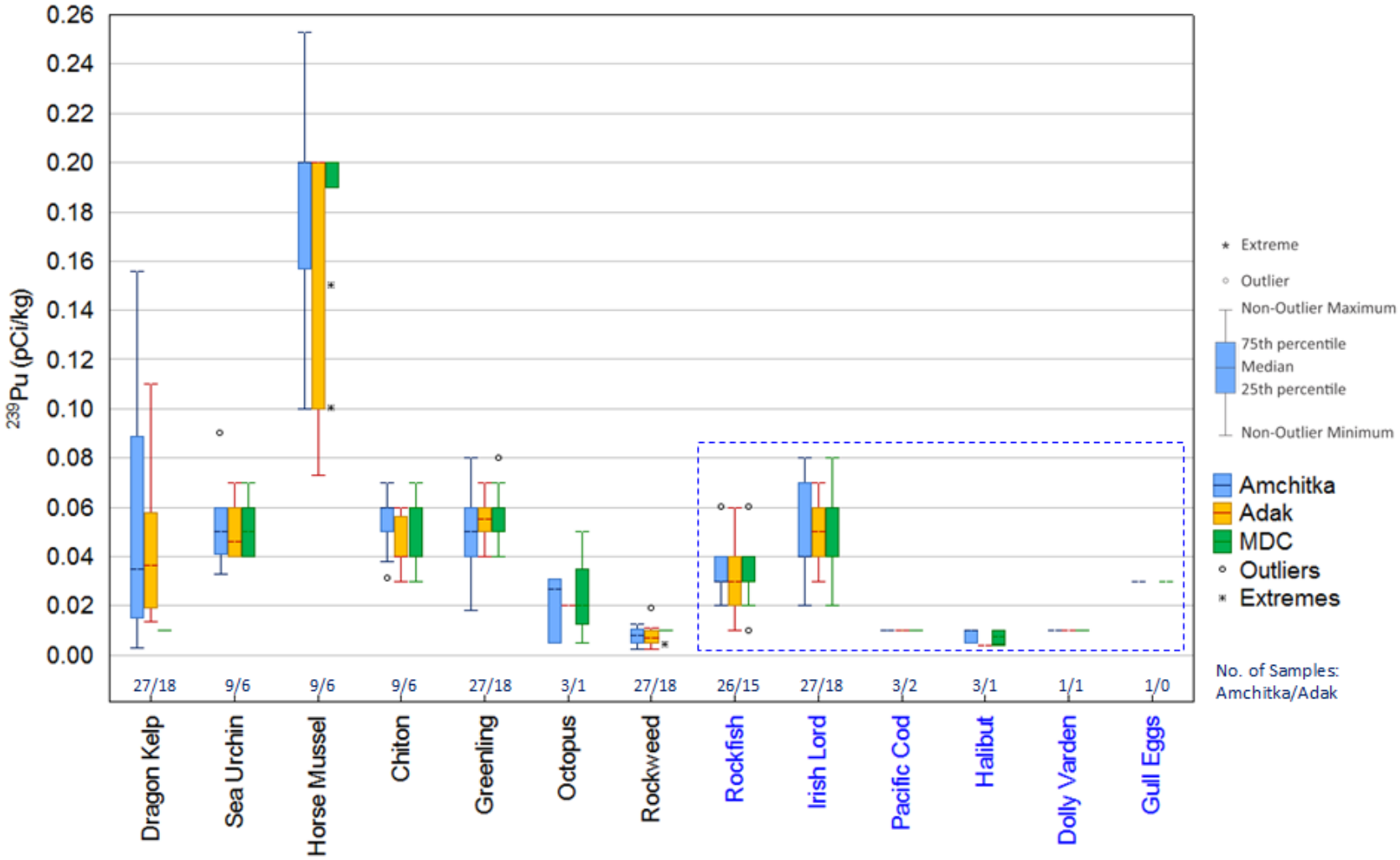


Figure 14. ^{239}Pu in Selected Marine Vegetation, Fauna, and Gull Eggs

Species in the rightmost portion of graph (blue font, outlined) are those for which all results were less than the MDC.
This plot excludes outlier nondetect datum HMUS-LS-LT3-1 and corresponding MDC (2 pCi/kg).

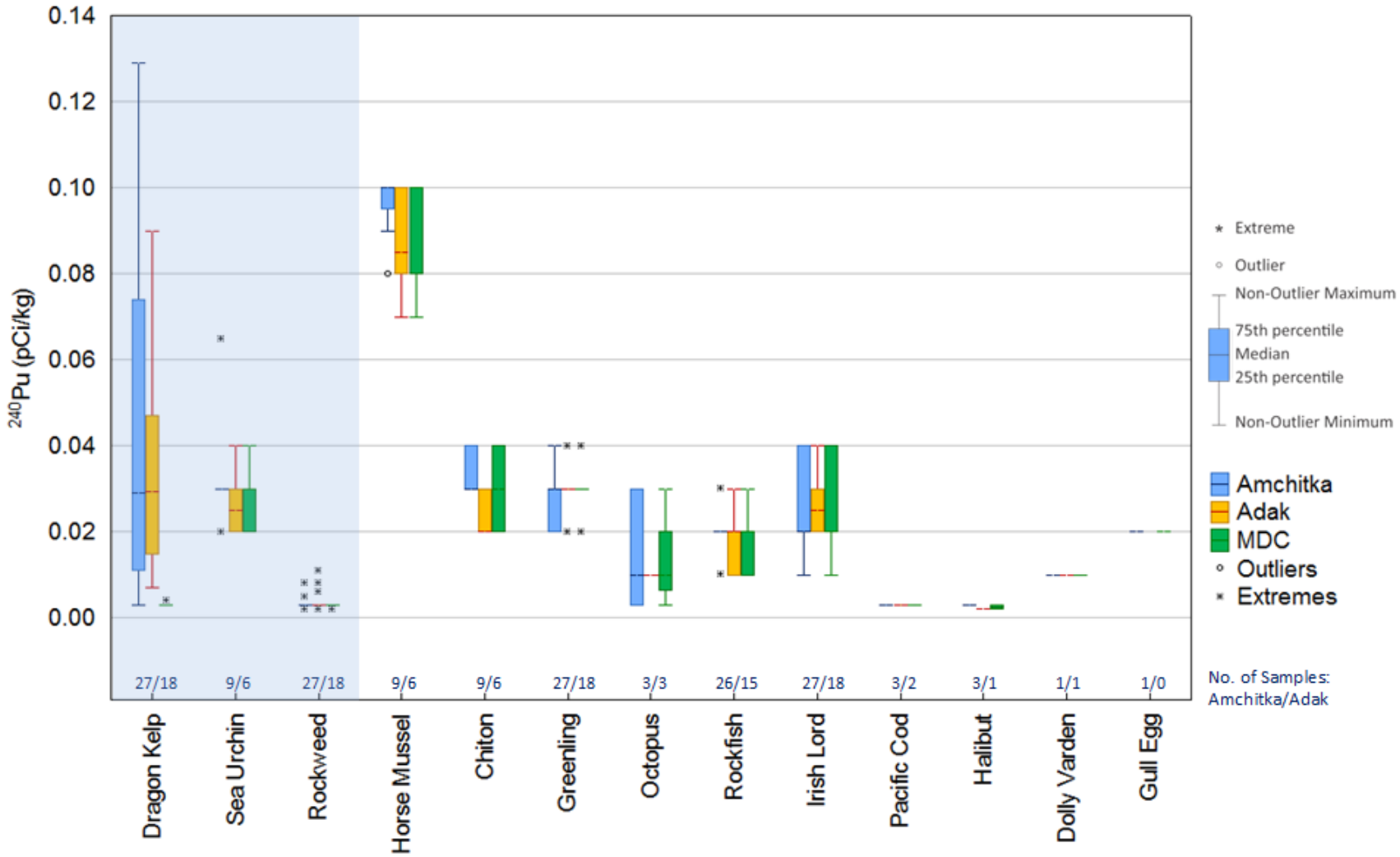


Figure 15. ^{240}Pu in Selected Marine Vegetation, Fauna, and Gull Eggs

Only three species/media—dragon kelp, sea urchin, and rockweed (shaded)—had detectable levels of ^{240}Pu. Results for remaining species were all below corresponding MDCs. This plot excludes outlier nondetect datum HMUS-LS-LT3-1 and corresponding MDC (1 pCi/kg).

Quantifiable concentrations of ^{239}Pu and/or ^{240}Pu were obtained in the vast majority of dragon kelp and rockweed samples along with selected samples of chiton, octopus, sea urchin, and horse mussel. Levels of ^{239}Pu and ^{240}Pu in fish species are consistently at or below the reported MDC.

Based on the standard deviation of 10 reported replicate blank measurements, the estimated MDC for ^{239}Pu and ^{240}Pu is 0.03 and 0.02 pCi, respectively. The mean reported sample measurement MDCs for ^{239}Pu and ^{240}Pu (excluding one outlier for a sample with a very low mass) expressed as activity concentrations were 0.04 and 0.02 pCi/kg wet weight, respectively. Analyses of mass ratio and concentration performed on certified reference materials satisfied laboratory data quality requirements for both precision and accuracy. Similarly, a series of duplicate measurement met applicable data quality requirements within the quantifiable capabilities of the technique. High-quality data appear to have been developed for plutonium isotopes in dragon kelp as evidenced by the internal consistency of ^{240}Pu/^{239}Pu atom ratios measured in this species. Moreover, it appears reasonable that dragon kelp and possibly rockweed could serve as good indicator species for future trending analysis of plutonium contamination in this region.

5.6 Uranium Isotopes

A full listing of individual measurement data for ^{234}U, ^{235}U, and ^{238}U in vegetation and marine fauna collected during the Amchitka 2011 sampling event is given in Appendix J (after Hamilton et al. 2012e). Data are reported in units of picocuries per kilogram wet weight. For quick reference, data are sorted according to species type and location/grid. Quantifiable activity concentrations for ^{234}U, ^{235}U, and ^{238}U with reasonable levels of precision are reported for all vegetation and fauna samples with the exception of ^{234}U in one horse mussel sample.

The ^{234}U, ^{235}U, and ^{238}U content of vegetation and fauna collected from the Adak and Amchitka sites is shown graphically in Figure 16 through Figure 18, respectively. Additionally, with overall concentrations of ^{234}U, ^{235}U, and ^{238}U being very low, Figure 19 through Figure 21 show box plots for selected species and media with the lowest (<25 pCi/kg) ^{234}U, ^{235}U, and ^{238}U concentrations, respectively.

No weight or analyte corrections were made for the presence of sea salts and inherent concentrations of uranium in ocean water for large-volume samples of rockweed and dragon kelp known to contain significant free and interstitial water.

5.7 Tritium in Seawater

A full listing of the tritium data for seawater collected during 2011 off the coastlines of Cannikin, Long Shot, and Milrow sites, as well as the north and south coastlines of Adak, is given in Appendix K.

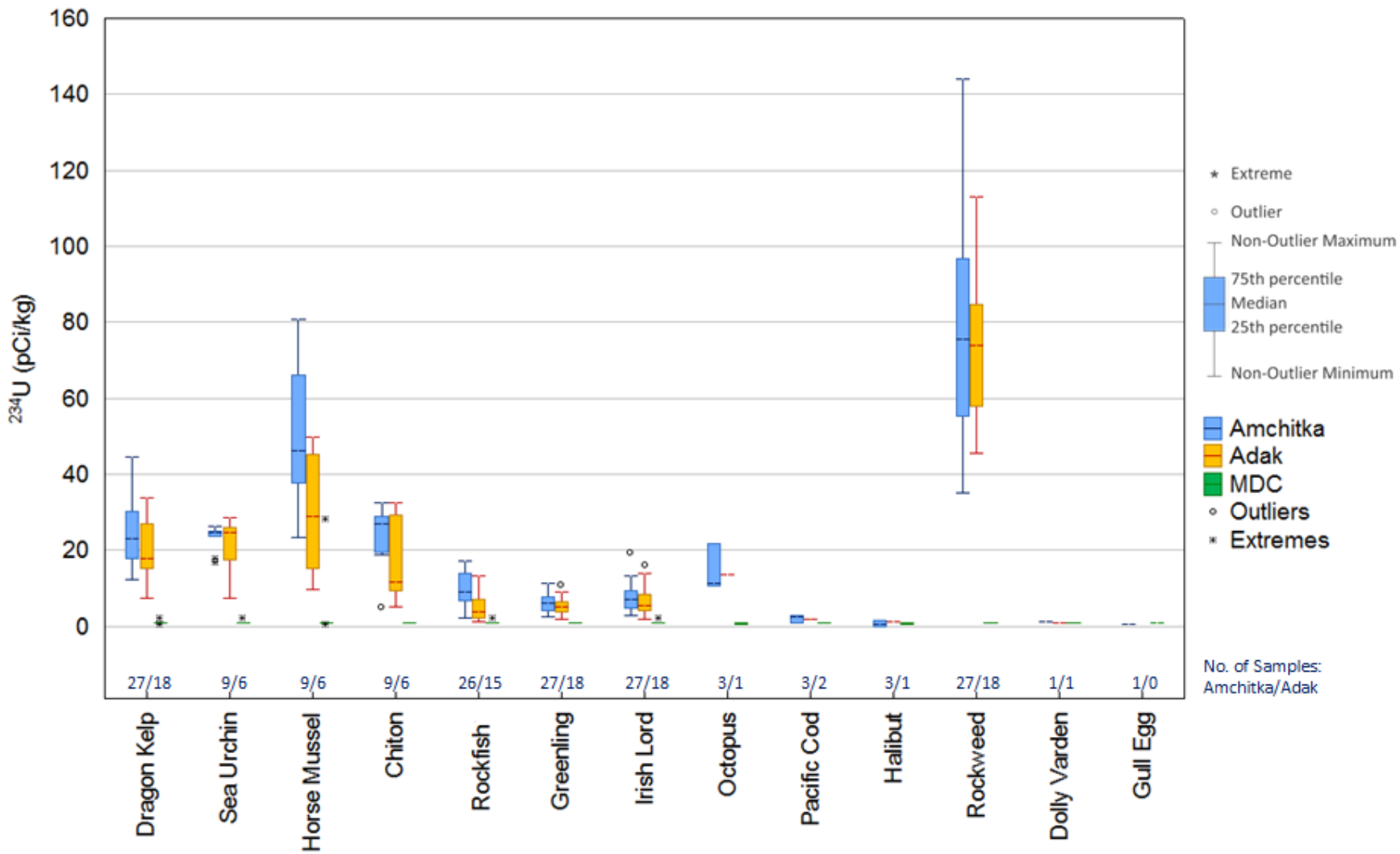


Figure 16. ^{234}U in Selected Marine Vegetation, Fauna, and Gull Eggs

As found for the other U isotopes (Figures 17–18), ^{234}U concentrations are highest in horse mussel and rockweed. A zoom-view of results for species with lower ^{234}U concentrations (<25 pCi/kg) is provided in Figure 19.

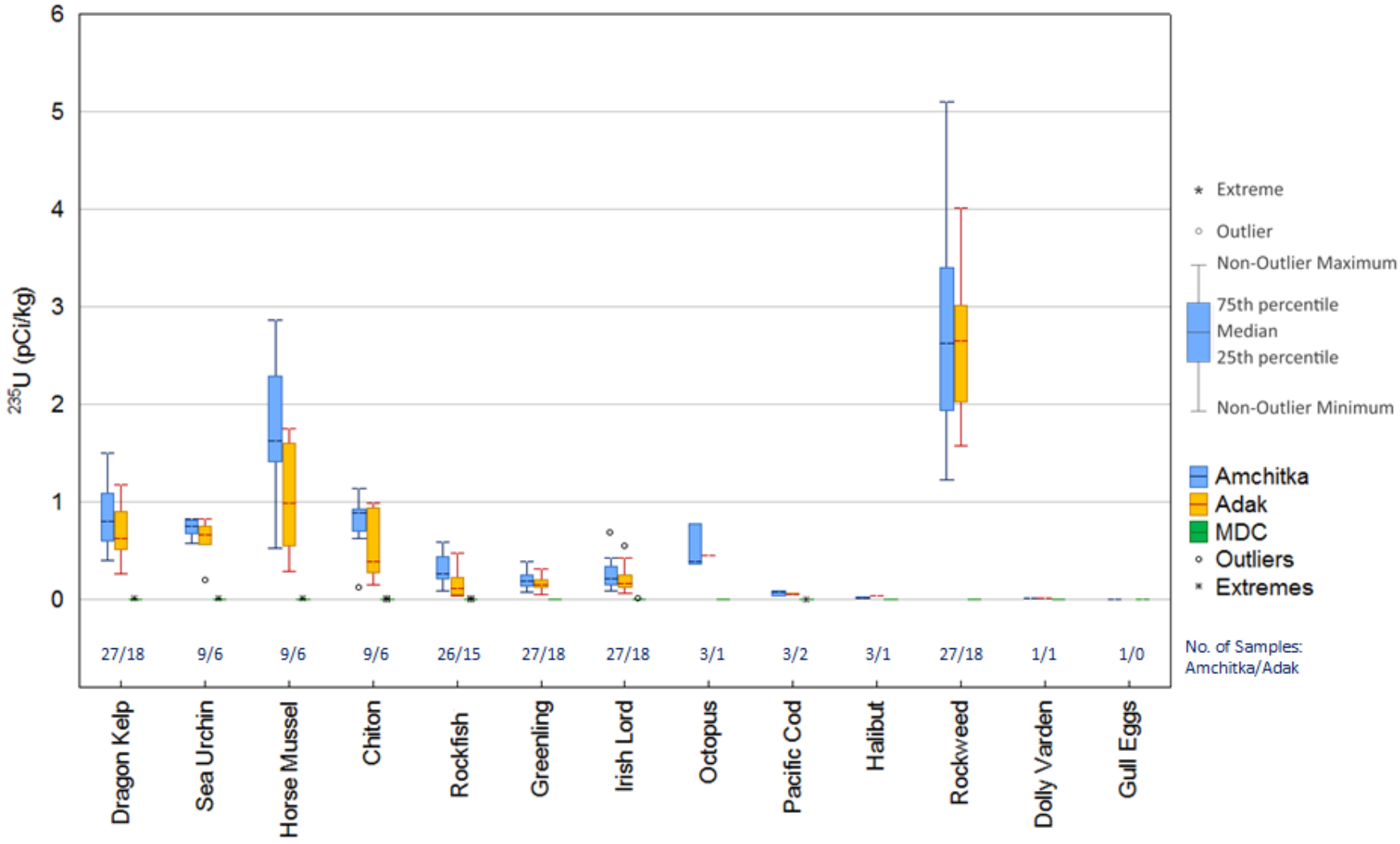


Figure 17. ^{235}U in Selected Marine Vegetation, Fauna, and Gull Eggs

As is the case for ^{234}U and ^{238}U, ^{235}U concentrations are highest in horse mussel and rockweed. A zoom-view of results for species with lower ^{235}U concentrations (<1 pCi/kg) is provided in Figure 20.

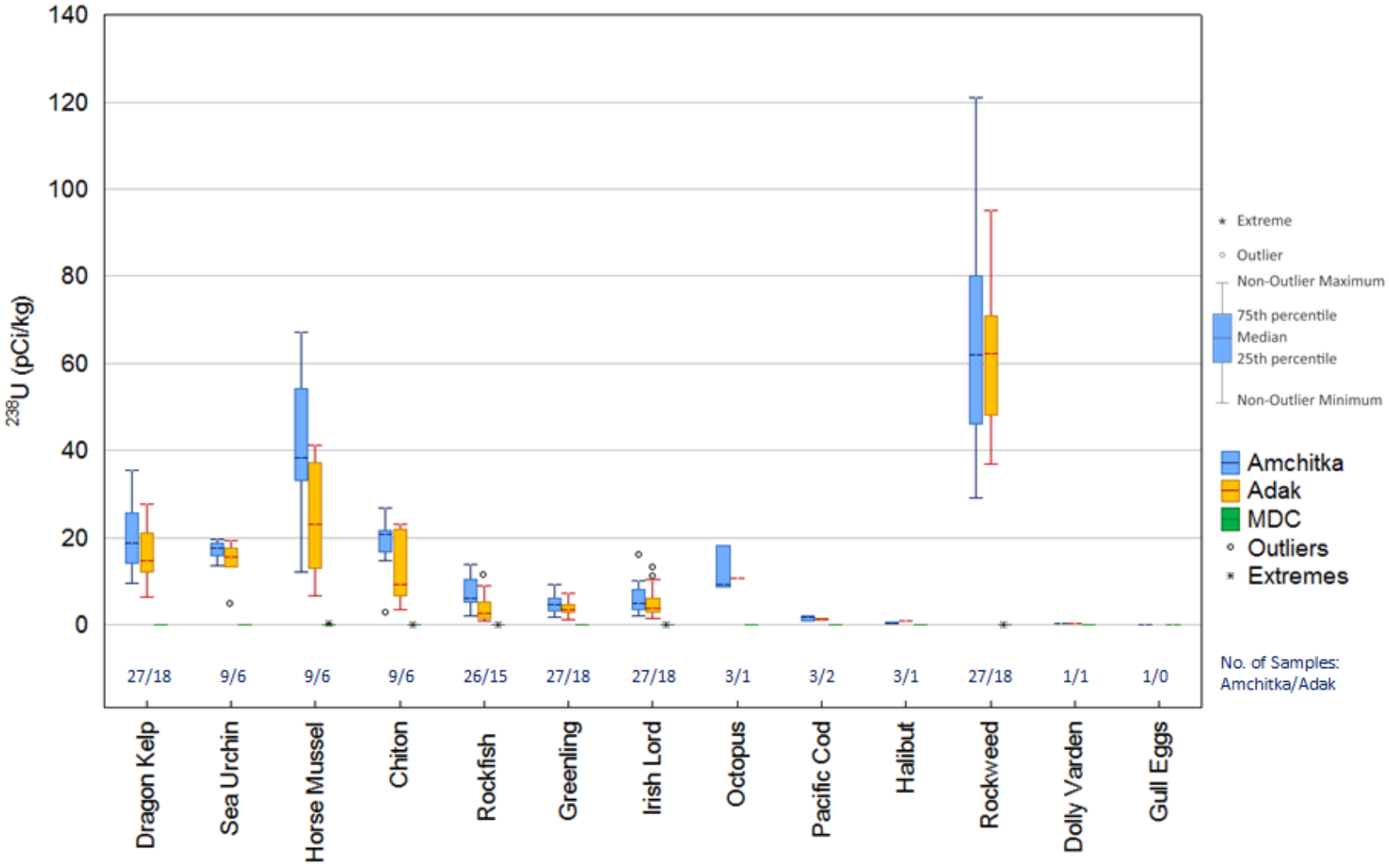


Figure 18. ^{238}U in Selected Marine Vegetation, Fauna, and Gull Eggs

^{238}U Magnitude and Distributions Are Very Similar to Those for ^{234}U; Concentrations Are Highest in Horse Mussel and Rockweed. A zoom-view of results for species with lower ^{238}U concentrations (<20 pCi/kg) is provided in Figure 21.

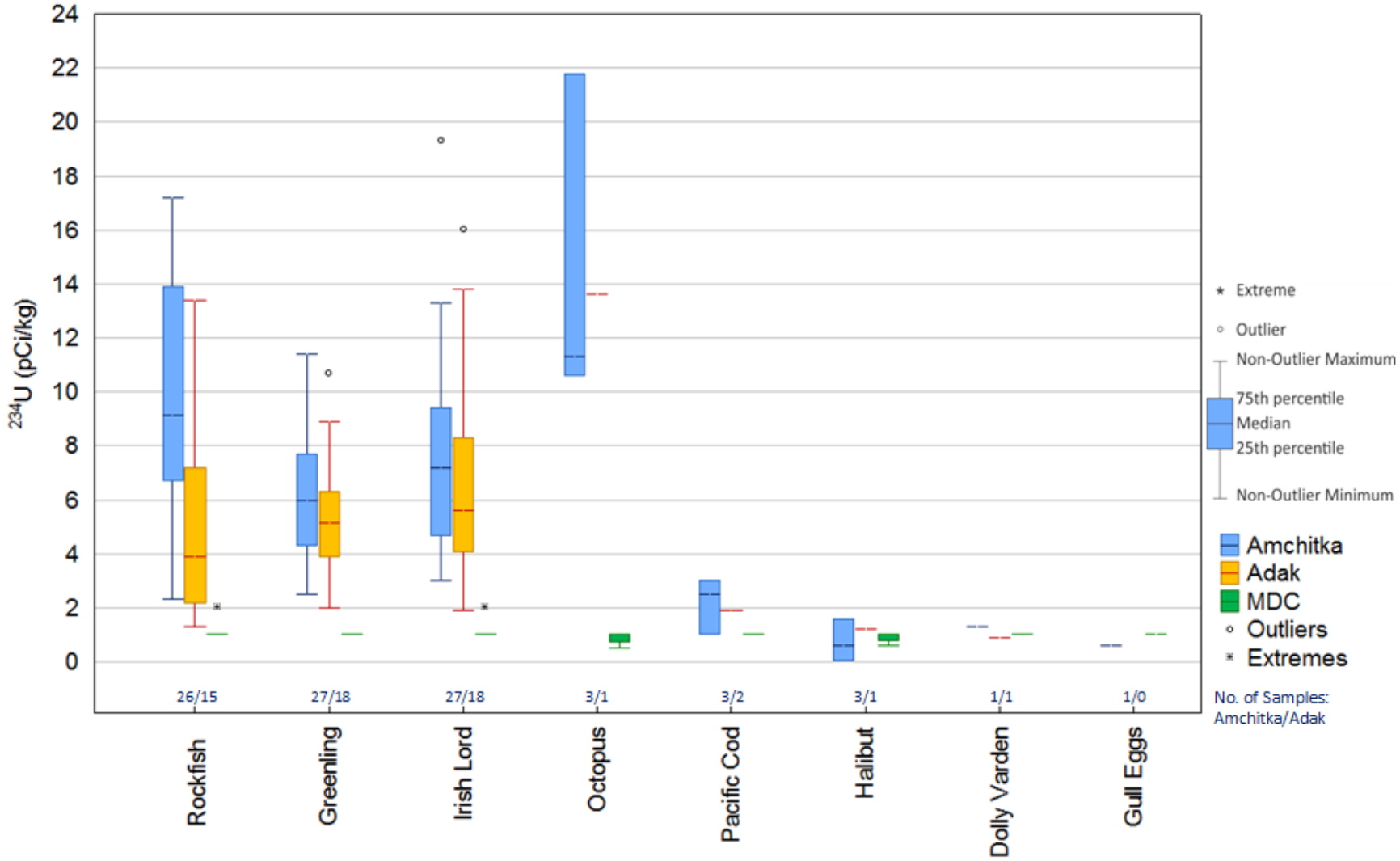


Figure 19. Zoom view of ^{234}U in Species and Media with Concentrations <25 pCi/kg

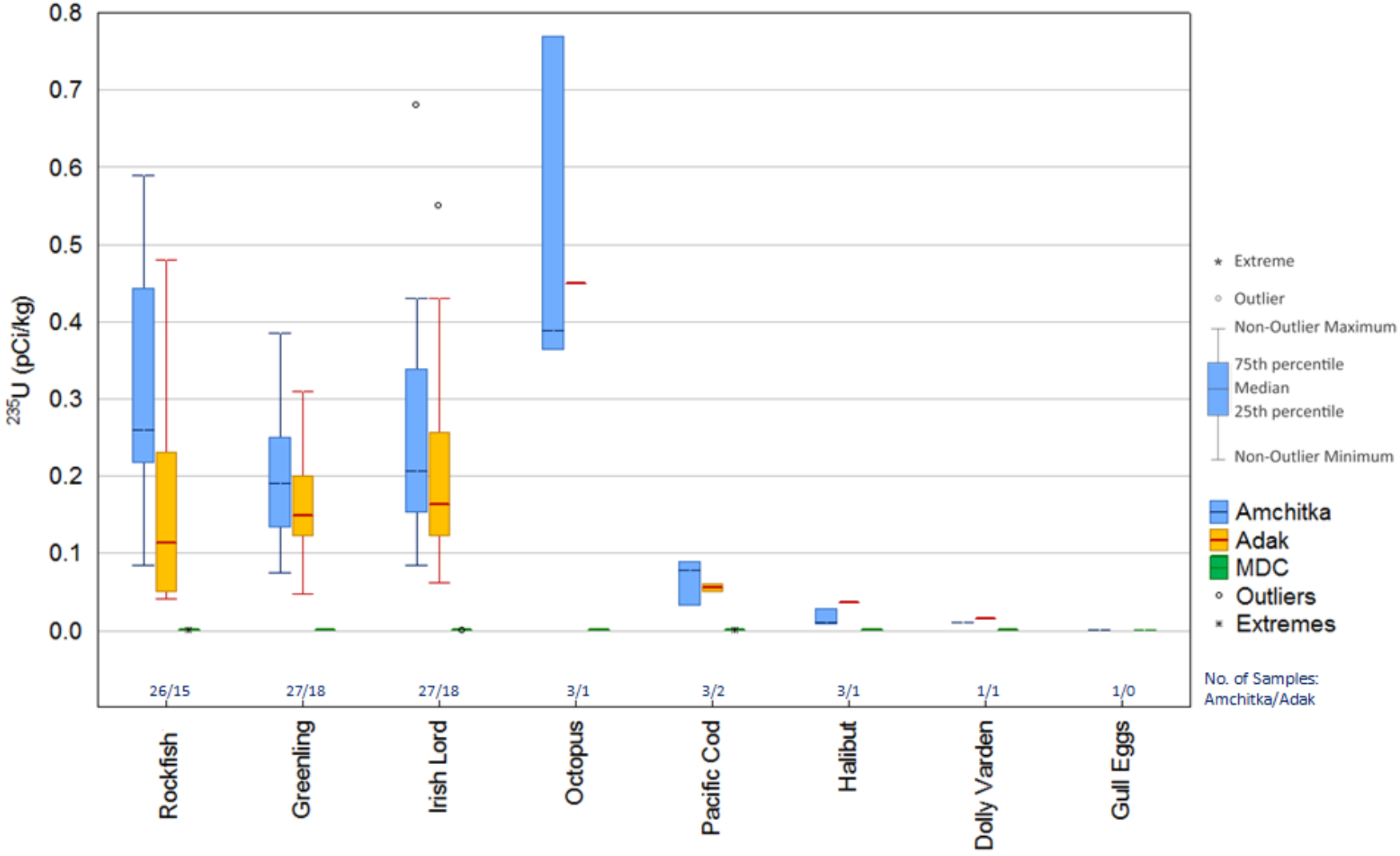


Figure 20. Zoom View of ^{235}U in Species and Media with Concentrations <1 pCi/kg

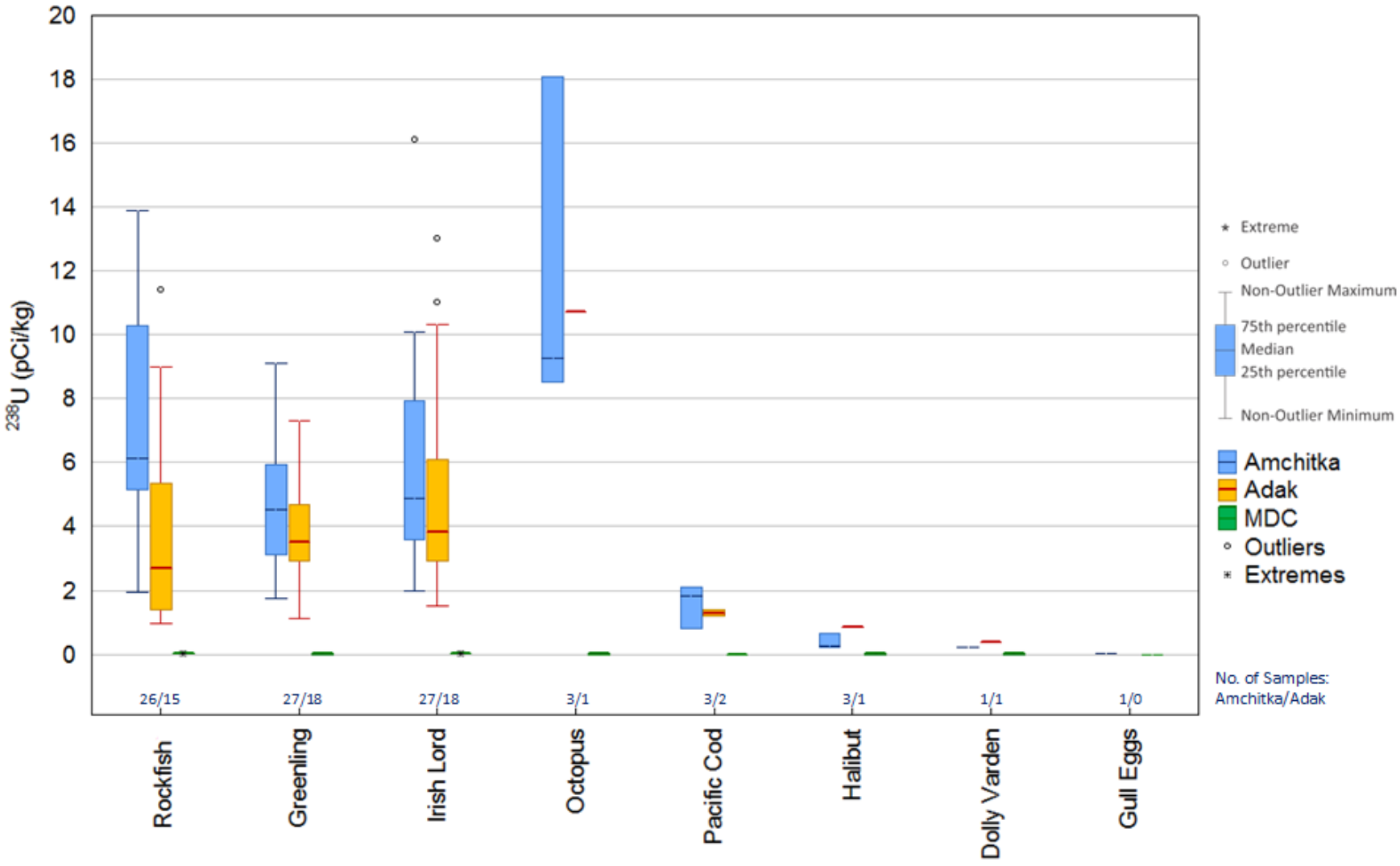


Figure 21. Zoom View of ^{238}U in Species and Media with Concentrations <1 pCi/kg

6.0 Data Analysis

6.1 Summary Statistics

Table 5 through Table 12 present the ranges of detected values (results at or greater than the MDC) and summary statistics for results from the 2011 sampling of Amchitka and Adak Islands. Nondetects are set equal to the MDC. Where duplicate sample results are available, the higher value of either the duplicate or the sample result is used. The species for which duplicate samples were collected are dragon kelp, rockweed, rockfish, greenling, and halibut. Refer to corresponding raw data summaries in Appendixes G–J and to LLNL (2012).

6.1.1 Cesium-137 Isotope

Table 5 shows the summary statistics for ^{137}Cs. The established range for horse mussel excludes sample HMUS-LS-LT3 in which the MDC was 60 pCi/kg wet weight, and the subsequent result was 44U ± 11 pCi/kg wet weight. U-flagged data are excluded from the statistical evaluation. The highest mean concentration of ^{137}Cs in marine fauna measured across both sites was observed in horse mussel. The mean concentration of ^{137}Cs in horse mussel was 11.5 pCi/kg wet weight for Amchitka and 9.4 pCi/kg wet weight for Adak. Mean and median concentrations in marine vegetation and fauna samples collected from Amchitka (*n* [number of samples] = 27) were 1.1 and 1.0 pCi/kg wet weight, respectively, whereas those from Adak (*n* = 18) were 0.7 and 0.7 pCi/kg. Maximum concentrations measured in marine vegetation and fauna samples from Amchitka and Adak were 14.0 and 15.0 pCi/kg, respectively.

6.1.2 Americium-241 Isotope

Quantifiable concentrations of ^{241}Am were detected (albeit at very low concentrations) for the vast majority of dragon kelp, sea urchin, chiton, and to some degree, horse mussels. Levels in all fish species appear to consistently fall at or below the MDC. Table 6 shows the summary statistics for ^{241}Am.

The highest mean concentrations of ^{241}Am in samples of marine vegetation and fauna from both sites were typically observed in horse mussel, chiton, and urchin. For the Adak site, the mean concentration of ^{241}Am in horse mussel, 0.073 pCi/kg wet weight, and urchin, 0.078 pCi/kg wet weight, were indistinguishable from that in chitin, 0.046 /kg wet weight, but were otherwise higher than for all other groups. Similarly, for the Amchitka site, the mean concentration of ^{241}Am in horse mussel, 0.143 pCi/kg wet weight, was indistinguishable from that in urchin, 0.116 pCi/kg wet weight, but was otherwise higher than for all other groups. The mean rockweed value reported for Adak, 0.005 pCi/kg wet weight, was higher than the mean reported for Amchitka, 0.002 pCi/kg wet weight, but the mean value measured for chiton was higher for samples collected from Amchitka, 0.084 pCi/kg wet weight, than for samples collected from Adak, 0.046 pCi/kg wet weight.

Table 5. Descriptive Statistics for ^{137}Cs

All units in pCi/kg wet weight except for soil and sediment, which are reported in dry weight.

Species / Area	No. of Detects (% > MDC)	Range of Detects	Range of all Results	Median	Mean ± SD	Range of MDCs
Dragon Kelp						
Amchitka	27 of 27 100%	0.24 – 3.2		1.4	1.6 ± 0.9	0.1 – 0.7
Adak	18 of 18 100%	0.2 – 2.0		0.80	0.87 ± 0.5	0.2 – 0.5
Sea Urchin						
Amchitka	5 of 9 55.6%	1.8 – 9.9	−0.1 – 9.9	1.8	2.9 ± 3.4	1.1 – 4.3
Adak	2 of 6 33.3%	2.7 – 9.4	0.3 – 9.4	1.5	2.8 ± 3.3	1.2 – 3.7
Horse Mussel						
Amchitka	6 of 9 66.7%	5.9 – 14.0	1.4 – 44	7.0	11.5 ± 12.9	2.6 – 60
Adak	6 of 6 100%	3.4 – 15.0	3.4 – 15	9.1	9.4 ± 4.7	2.7 – 5.0
Chiton						
Amchitka	3 of 9 33.3%	1.6 – 4.1	1.6 – 4.1	1.6	1.6 ± 1.5	1.2 – 2.8
Adak	4 of 6 66.7%	0.8 – 1.3	0.8 – 1.3	1.1	0.9 ± 0.7	0.7 – 4.0
Rockfish						
Amchitka	23 of 26 88.5%	1.1 – 6.4	0.5 – 6.4	3.4	3.4 ± 1.5	0.7 – 2.2
Adak	14 of 15 93.3%	1.2 – 9.4	1.2 – 9.4	3.4	3.9 ± 2.1	0.5 – 2.4
Greenling						
Amchitka	26 of 27 96.3%	1.9 – 7.8	1.9 – 7.8	4.9	4.7 ± 1.8	1.5 – 2.8
Adak	18 of 18 100%	0.9 – 7.4	0.9 – 7.4	3.6	3.8 ± 1.7	1.3 – 3.6
Irish Lord						
Amchitka	18 of 27 66.7%	1.2 – 9.5	−0.2 – 9.5	2.1	2.7 ± 2.2	0.8 – 3.9
Adak	10 of 18 55.6%	1.8 – 13.0	−0.1 – 13	1.9	2.7 ± 3.0	0.9 – 2.5
Octopus						
Amchitka	3 of 3 100%	0.23 – 2.1		1.1	1.1 ± 0.9	0.2 – 1.1
Adak	1 of 1 100%	0.7		0.7	0.7	0.5
Pacific Cod						
Amchitka	3 of 3 100%	2.1 – 3.8		2.8	2.9 ± 0.9	0.2 – 0.5
Adak	2 of 2 100%	2.0 – 3.0		2.5	2.5 ± 0.7	0.2 – 0.3
Halibut						
Amchitka	3 of 3 100%	0.82 – 1.5		1.0	1.1 ± 0.4	0.1 – 0.2
Adak	1 of 1 100%	1.0		1.0	1.0	0.2
Rockweed						
Amchitka	27 of 27 100%	1.3 – 5.8		3.3	3.4 ± 1.2	0.2 – 0.5
Adak	18 of 18 100%	1.0 – 7.3		3.7	4.0 ± 1.8	0.3 – 0.5
Reindeer Lichen						
Amchitka	3 of 3 100%	404 – 1523		550	826 ± 608	8.0 – 15.0
Adak	3 of 3 100%	2855 – 6236		3238	4110 ± 1851	16.0 – 33.0
Gull Eggs (no eggs found on Adak)						
Amchitka	1 of 1 100%	4.2				1.5
Dolly Varden						
Amchitka	1 of 1 100%	98.0				1.0
Adak	1 of 1 100%	447				1.0
Soil						
Amchitka	3 of 3 100%	312 – 6110		2174	2865 ± 2960	45.0 – 206
Adak	3 of 3 100%	1135 – 7264		6591	4997 ± 3361	42.0 – 184
Sediment						
Amchitka	2 of 2 100%	11.9 – 36.3		24.1	24.1 ± 17.3	6.0 – 12.0

MDC – Minimum Detectable Concentration; SD – Standard Deviation. Statistics computed with values = MDC for nondetects. The second range column—"Range of all Results"—includes U-flagged (< MDC) results. This column is left blank for those species/media with 100% detection frequencies. Duplicate samples were collected for Dragon Kelp (3 Amchitka/2 Adak); Rockfish (4/1); greenling (3/2); halibut (0/1); and rockweed (3/2). The maximum result for each duplicate pair was used.

Table 6. Descriptive Statistics for ^{241}Am

All units in pCi/kg wet weight.

Species / Area	No. of Detects (% > MDC)	Range of Detects	Range of all Results	Median	Mean ± SD	Range of MDCs
Dragon Kelp						
Amchitka	20 of 27 74.1%	0.003 – 0.033	−0.001 – 0.033	0.009	0.012 ± 0.010	0.0003 – 0.004
Adak	15 of 18 83.3%	0.006 – 0.027	0.001 – 0.027	0.009	0.010 ± 0.007	0.0002 – 0.002
Sea Urchin						
Amchitka	8 of 9 88.9%	0.08 – 0.20	0.080 – 0.200	0.110	0.116 ± 0.038	0.002 – 0.01
Adak	5 of 6 83.3%	0.07 – 0.12	0.030 – 0.120	0.075	0.078 ± 0.031	0.003 – 0.03
Horse Mussel						
Amchitka	6 of 9 66.7%	0.11 – 0.21	0.02 – 0.40	0.11	0.14 ± 0.11	0.005 – 0.80
Adak	2 of 6 33.3%	0.09 – 0.15	0.03 – 0.15	0.07	0.073 ± 0.04	0.009 – 0.05
Chiton						
Amchitka	8 of 9 88.9%	0.070 – 0.14	0.050 – 0.140	0.08	0.084 ± 0.027	0.002 – 0.01
Adak	4 of 6 66.7%	0.017 – 0.08	0.010 – 0.080	0.05	0.046 ± 0.029	0.002 – 0.02
Rockfish						
Amchitka	3 of 26 11.5%	0.009 – 0.07	−0.004 – 0.07	0.007	0.009 ± 0.014	0.003 – 0.03
Adak	0 of 15 ND		−0.002 – 0.02			0.003 – 0.01
Greenling						
Amchitka	4 of 27 14.8%	0.030 – 0.034	−0.001 – 0.05	0.01	0.014 ± 0.012	0.002 – 0.02
Adak	3 of 18 16.7%	0.009 0.033	0.002 – 0.033	0.01	0.013 ± 0.009	0.002 – 0.03
Irish Lord						
Amchitka	3 of 27 11.1%	0.006 0.03	−0.002 – 0.05	0.010	0.011 ± 0.010	0.002 – 0.02
Adak	1 of 18 5.6%	0.03	0.003 – 0.03	0.010	0.013 ± 0.008	0.004 – 0.01
Octopus						
Amchitka	2 of 3 66.7%	0.017 – 0.019	0.009 – 0.019	0.017	0.015 ± 0.005	0.0004 – 0.007
Adak	1 of 1 100%	0.015	0.015	0.015	0.015	0.002
Pacific Cod						
Amchitka	0 of 3 ND		0.0004 – 0.003			0.001 – 0.002
Adak	0 of 2 ND		0.001 – 0.001			0.001
Halibut						
Amchitka	0 of 3 ND		0.0006 – 0.001			0.001 – 0.002
Adak	0 of 1 ND		0.001			0.002
Rockweed						
Amchitka	6 of 27 22.2%	0.003 – 0.011	−0.002 – 0.011	0.002	0.002 ± 0.003	0.0005 – 0.006
Adak	7 of 18 38.9%	0.006 – 0.015	0.001 – 0.015	0.004	0.005 ± 0.005	0.0005 – 0.005
Gull Eggs (no eggs found on Adak)						
Amchitka	0 of 1 ND		0.008			0.01
Dolly Varden						
Amchitka	0 of 1 ND		0.001			0.002
Adak	0 of 1 ND		0.003			0.002

MDC – Minimum Detectable Concentration; ND – Not Detected (all results less than MDC); SD – Standard Deviation
The second range column, "Range of all Results", includes U-flagged (< MDC) results. Summary statistics were computed using values = MDC for nondetects. Duplicate samples were collected for Dragon Kelp (3 Amchitka/2 Adak); Rockfish (4/1); greenling (3/2); halibut (0/1); and rockweed (3/2). The maximum result for each duplicate pair was used. Medians, means, and standard deviations were not calculated for species for which all results were < MDC.

6.1.3 Plutonium Isotopes

Statistical analyses show that where quantifiable data are obtained (e.g., for dragon kelp and rockweed), the activity concentrations of ^{239}Pu between the Adak and Amchitka sites are indistinguishable. Table 7 and Table 8 show the summary statistics for ^{239}Pu and ^{240}Pu, respectively.

Plutonium isotopes were measured by quadrupole ICP-MS. The quantification capabilities of ICP-MS appear to be adequate for ^{239}Pu and ^{240}Pu measurements in dragon kelp samples and for ^{239}Pu measurements in rockweed samples. ^{239}Pu and ^{240}Pu loadings in all fish species and significant numbers of other fauna species were below the MDC. The mean dragon kelp value reported for Amchitka, 0.055 pCi/kg wet weight, was higher than the mean for samples collected from Adak, 0.048 pCi/kg wet weight, and rockweed mean values were equal for both Amchitka and Adak, 0.008 pCi/kg wet weight. Similarly, the mean ^{240}Pu value for dragon kelp is higher for Amchitka, 0.044 pCi/kg wet weight, than for Adak, 0.038 pCi/kg wet weight, but the rockweed mean value is just slightly higher for Adak, 0.004 pCi/kg wet weight, than for Amchitka, 0.003 pCi/kg wet weight.

The quantifiable concentrations of ^{239}Pu and/or ^{240}Pu in dragon kelp and rockweed shown in Table 9 fall in a relatively consistent range. For dragon kelp (n = 45), the mean value is 0.052 pCi/kg wet weight for ^{239}Pu and 0.042 pCi/kg wet weight for ^{240}Pu. For rockweed (n = 45), the mean value is 0.0076 pCi/kg wet weight for ^{239}Pu and 0.0034 pCi/kg wet weight for ^{240}Pu. These values suggest that reported levels for ^{239}Pu where data are available could be used without associated values for ^{240}Pu to estimate the total $^{239+240}$Pu content of marine fauna for use in health and ecological assessments.

6.1.4 Uranium Isotopes

Table 10 through Table 12 show the summary statistics for ^{234}U, ^{235}U, and ^{238}U, respectively. The total uranium content of rockweed is statistically higher at both sites than that measured in all other species. Uranium in horse mussel is also statistically higher at both sites, but not as high as rockweed. The mean concentrations of ^{234}U, ^{235}U, and ^{238}U in rockweed from samples collected at Amchitka were 81.6, 2.88, and 68.0 pCi/kg wet weight, respectively, all slightly higher than the mean concentrations of the same uranium isotopes in rockweed from samples collected at Adak, 72.7, 2.57, and 60.6 pCi/kg wet weight, respectively. The mean concentrations of ^{234}U, ^{235}U, and ^{238}U in horse mussels collected at Amchitka were 49.5, 1.70, and 40.0 pCi/kg wet weight, respectively, and once again were higher than the mean concentrations of the same uranium isotopes in horse mussel samples collected at Adak, 29.6, 1.03, and 24.1 pCi/kg wet weight, respectively.

No quantifiable levels of anthropogenic uranium based on ^{236}U detection and measurement (results not shown) were observed in samples collected during this sampling event, although reportable MDCs were relatively high (LLNL 2012).

Table 7. Descriptive Statistics for ^{239}Pu

All units in pCi/kg wet weight.

Species / Area	No. of Detects (% > MDC)			Range of Detects	Range of all Results	Median	Mean ± SD	Range of MDCs
Dragon Kelp								
Amchitka	27 of 27	100%		0.003 – 0.16	0.003 – 0.156	0.035	0.056 ± 0.044	0.01
Adak	18 of 18	100%		0.014 – 0.11	0.014 – 0.110	0.036	0.048 ± 0.034	0.01
Sea Urchin								
Amchitka	3 of 9	33.3%		0.033 – 0.090	0.033 – 0.09	0.050	0.053 ± 0.017	0.04 – 0.06
Adak	1 of 6	16.7%		0.042	0.040 – 0.07	0.046	0.050 ± 0.012	0.04 – 0.07
Horse Mussel								
Amchitka	2 of 9	22.2%		0.11 – 0.25	0.1 – 2.0	0.20	0.39 ± 0.61	0.1 – 2.0
Adak	1 of 6	16.7%		0.073	0.073 – 0.2	0.20	0.16 ± 0.06	0.1 – 0.2
Chiton								
Amchitka	3 of 9	33.3%		0.031 – 0.05	0.031 – 0.07	0.06	0.053 ± 0.012	0.05 – 0.07
Adak	1 of 6	16.7%		0.056	0.030 – 0.06	0.04	0.044 ± 0.011	0.03 – 0.06
Rockfish								
Amchitka	0 of 26	ND			0.02 – 0.06			0.02 – 0.06
Adak	0 of 15	ND			0.01 – 0.06			0.01 – 0.06
Greenling								
Amchitka	2 of 27	7.4%		0.018 – 0.02	0.018 – 0.08	0.05	0.05 ± 0.013	0.04 – 0.08
Adak	0 of 18	ND			0.04 – 0.07			0.04 – 0.07
Irish Lord								
Amchitka	0 of 27	ND			0.02 – 0.08			0.02 – 0.08
Adak	0 of 18	ND			0.03 – 0.07			0.03 – 0.07
Octopus								
Amchitka	2 of 3	66.7%		0.027 – 0.031	0.005 – 0.031	0.027	0.021 ± 0.014	0.005 – 0.05
Adak	1 of 1	100%		0.020	0.02	0.02	0.02	0.02
Pacific Cod								
Amchitka	0 of 3	ND			0.01			0.01
Adak	0 of 2	ND			0.01			0.01
Halibut								
Amchitka	0 of 3	ND			0.005 – 0.01			0.005 – 0.01
Adak	0 of 1	ND			0.01			0.01
Rockweed								
Amchitka	25 of 27	92.6%		0.002 – 0.012	0.002 – 0.012	0.008	0.008 ± 0.003	0.004 – 0.01
Adak	15 of 18	83.3%		0.002 – 0.019	0.002 – 0.019	0.007	0.008 ± 0.004	0.004 – 0.01
Gull Eggs (no eggs found on Adak)								
Amchitka	0 of 1	ND			0.03			0.03
Dolly Varden								
Amchitka	0 of 1	ND			0.01			0.01
Adak	0 of 1	ND			0.01			0.01

MDC – Minimum Detectable Concentration; ND – Not Detected (all results less than MDC); SD – Standard Deviation
The second range column, "Range of all Results", includes U-flagged (< MDC) results. Summary statistics were computed using values = MDC for nondetects. Duplicate samples were collected for Dragon Kelp (3 Amchitka/2 Adak); Rockfish (4/1); greenling (3/2); halibut (0/1); and rockweed (3/2). The maximum result for each duplicate pair was used. Medians, means, and standard deviations were not calculated for species for which all results were < MDC.

Table 8. Descriptive Statistics for ^{240}Pu

All units in pCi/kg wet weight.

Species / Area	No. of Detects (% > MDC)	Range of Detects	Range of all Results	Median	Mean ± SD	Range of MDCs
Dragon Kelp						
Amchitka	25 of 27 92.6%	0.007 – 0.129	0.003 – 0.129	0.034	0.049 ± 0.036	0.003 – 0.004
Adak	18 of 18 100%	0.010 – 0.090	0.01 – 0.09	0.030	0.038 ± 0.027	0.003 – 0.004
Sea Urchin						
Amchitka	1 of 9 11.1%	0.065	0.02 – 0.065	0.030	0.032 ± 0.013	0.020 – 0.030
Adak	0 of 6 ND		0.02 – 0.04			0.020 – 0.040
Horse Mussel						
Amchitka	0 of 9 ND		0.08 – 1.0			0.08 – 1.0
Adak	0 of 6 ND		0.07 – 0.10			0.07 – 0.1
Chiton						
Amchitka	0 of 9 ND		0.03 – 0.04			0.03 – 0.04
Adak	0 of 6 ND		0.02 – 0.03			0.02 – 0.03
Rockfish						
Amchitka	0 of 26 ND		0.01 – 0.03			0.01 – 0.03
Adak	0 of 15 ND		0.01 – 0.03			0.01 – 0.03
Greenling						
Amchitka	0 of 27 ND		0.02 – 0.04			0.02 – 0.04
Adak	0 of 18 ND		0.02 – 0.04			0.02 – 0.04
Irish Lord						
Amchitka	0 of 27 ND		0.01 – 0.04			0.01 – 0.04
Adak	0 of 18 ND		0.02 – 0.04			0.02 – 0.04
Octopus						
Amchitka	0 of 3 ND		0.003 – 0.03			0.003 – 0.03
Adak	0 of 3 ND		0.01			0.01
Pacific Cod						
Amchitka	0 of 3 ND		0.003			0.003
Adak	0 of 2 ND		0.003			0.003
Halibut						
Amchitka	0 of 3 ND		0.003			0.003
Adak	0 of 1 ND		0.003			0.003
Rockweed						
Amchitka	2 of 27 7.4%	0.005 – 0.008	0.002 – 0.008	0.006	0.006 ± 0.002	0.002 – 0.003
Adak	3 of 18 16.7%	0.006 – 0.011	0.002 – 0.011	0.008	0.008 ± 0.003	0.002 – 0.003
Gull Eggs (no eggs found on Adak)						
Amchitka	0 of 1 ND		0.02			0.02
Dolly Varden						
Amchitka	0 of 1 ND		0.01			0.01
Adak	0 of 1 ND		0.01			0.01

MDC – Minimum Detectable Concentration; ND – Not Detected (all results less than MDC); SD – Standard Deviation
The second range column, "Range of all Results", includes U-flagged (< MDC) results. Summary statistics were computed using values = MDC for nondetects. Duplicate samples were collected for Dragon Kelp (3 Amchitka/2 Adak); Rockfish (4/1); greenling (3/2); halibut (0/1); and rockweed (3/2). The maximum result for each duplicate pair was used. Medians, means, and standard deviations were not calculated for species for which all results were < MDC.

Table 9. Summary of ^{239}Pu and ^{240}Pu Detections

All units in pCi/kg wet weight.

Species / Area	Total No. of Samples	No. of Detects Pu-239	No. of Detects Pu-240	Mean* Pu-239	Mean* Pu-240	Range* Pu-239	Range* Pu-240	Max. Detected Pu-239	Max. Detected Pu-240	Max. MDC Pu-239	Max. MDC Pu-240	Pu-239, 240 (combined)** Mean	Pu-239, 240 (combined)** Range
Dragon Kelp	45	45	43	0.053	0.042	0.003 – 0.16	0.003 – 0.13	0.16	0.13	0.01	0.004	0.095	0.0028 – 0.29
Sea Urchin	15	4	1	0.052	0.030	0.033 – 0.09	0.020 – 0.065	0.09	0.065	0.07	0.04	0.056	0.033 – 0.16
Rockweed	45	40	5	0.008	0.003	0.002 – 0.019	0.002 – 0.011	0.019	0.011	0.01	0.003	0.008	0.002 – 0.03
Horse Mussel	15	3	0	0.30	0.15	0.073 – 2.0	0.070 – 1.0	0.25		2.0	1.0	0.30	0.073 – 2.0
Chiton	15	4	0	0.05	0.03	0.03 – 0.07	0.02 – 0.04	0.056		0.07	0.04	0.05	0.03 – 0.07
Greenling	45	2	0	0.052	0.029	0.018 – 0.08	0.02 – 0.04	0.020		0.08	0.04	0.052	0.018 – 0.08
Octopus	4	3	0	0.021	0.013	0.005 – 0.031	0.003 – 0.030	0.031		0.05	0.03	0.021	0.005 – 0.031
Rockfish	41	0	0	0.035	0.018	0.01 – 0.06	0.01 – 0.03			0.06	0.03	0.035	0.01 – 0.06
Irish Lord	45	0	0	0.05	0.027	0.02 – 0.08	0.01 – 0.04			0.08	0.04	0.05	0.02 – 0.08
Pacific Cod	5	0	0	0.01	0.003	0.01	0.003			0.01	0.003	0.01	0.01 – 0.01
Halibut	4	0	0	0.009	0.003	0.005 – 0.01	0.003			0.01	0.003	0.009	0.005 – 0.010
Gull Eggs	1	0	0	0.03	0.02	0.03	0.02			0.03	0.02	0.03	0.03
Dolly Varden	2	0	0	0.01	0.01	0.01	0.01			0.01	0.01	0.01	0.01

No. of Detects refers to results ≥ MDC (not U-flagged), where MDC = Minimum Detectable Concentration.
Dragon kelp, sea urchin, and rockweed (initial rows) were the only species with detectable levels of Pu-240. Shaded rows denote species for which only Pu-239 was detected.
* Means and ranges for individual Pu isotopes were computed using all results, including U-flagged data.
For dragon kelp, rockfish, greenling, halibut, and rockweed, the maximum result for each duplicate pair was used.
See preceding tables for radioisotope-specific statistics and Amchitka vs. Adak breakdowns.

** Approach for calculating summary statistics for Pu-239, 240 combined
If both Pu-239 and Pu-240 were detected (≥ MDC), results were summed. If Pu-239 detected, but not Pu-240, used only the Pu-239 result(s).
The opposite situation—Pu-240 detected but not Pu-239—does not apply to this data set.
If both Pu-239 and Pu-240 results were U-flagged (< MDC), the maximum flagged value was used. E.g., if Pu-239 = 4U and Pu-240 = 2.0U, used the 4.0 datum to calculate means.

Table 10. Descriptive Statistics for ^{234}U

All units in pCi/kg wet weight.

Species / Area	No. of Detects (% > MDC)			Range of Detects	Range of all Results	Median	Mean ± SD	Range of MDCs
Dragon Kelp								
Amchitka	27	of 27	100%	12.4 – 44.6		23.2	24.6 ± 9.1	1.0 – 2.0
Adak	18	of 18	100%	7.3 – 46.8		20.8	20.8 ± 9.9	0.4 – 1.0
Sea Urchin								
Amchitka	9	of 9	100%	16.7 – 26.4	16.7 – 26.4	24.6	23.3 ± 3.6	1.0 – 2.0
Adak	5	of 6	83.3%	17.4 – 28.5	7.4 – 28.5	24.8	21.5 ± 7.8	1.0 – 2.0
Horse Mussel								
Amchitka	8	of 9	88.9%	23.4 – 80.8	23.4 – 80.8	46.3	49.5 ± 19.6	1.0 – 28
Adak	6	of 6	100%	9.7 – 49.8	9.7 – 49.8	28.8	29.6 ± 16.2	0.5 – 1.0
Chiton								
Amchitka	9	of 9	100%	5.0 – 32.4	5.0 – 32.4	27.0	24.0 ± 8.6	1.0
Adak	5	of 6	83.3%	9.4 – 32.5	5.1 – 32.5	11.7	16.6 ± 11.4	1.0
Rockfish								
Amchitka	25	of 26	96.2%	2.3 – 19.5	2.3 – 19.5	10.1	10.3 ± 4.8	1.0 – 2.0
Adak	12	of 15	80.0%	2.2 – 13.4	1.3 – 13.4	3.9	5.4 ± 4.0	1.0 – 2.0
Greenling								
Amchitka	26	of 27	96.3%	2.5 – 11.4	2.5 – 11.4	6.0	6.3 ± 2.3	1.0
Adak	17	of 18	94.4%	2.0 – 10.7	2.0 – 10.7	5.2	5.4 ± 2.4	1.0
Irish Lord								
Amchitka	25	of 27	92.6%	3.0 – 19.3	3.0 – 19.3	7.2	7.5 ± 3.8	1.0 – 2.0
Adak	17	of 18	94.4%	2.9 – 16.0	1.9 – 16.0	5.6	7.1 ± 4.2	1.0
Octopus								
Amchitka	3	of 3	100%	10.6 – 21.8		11.3	14.6 ± 6.3	0.5 – 1.0
Adak	1	of 1	100%	13.6		13.6	13.6	1.0
Pacific Cod								
Amchitka	2	of 3	66.7%	2.5 – 3.0	1.0 – 3.0	2.5	2.2 ± 1.0	1.0
Adak	2	of 2	100%	1.9	1.9	1.9	1.9 ± 0.0	1.0
Halibut								
Amchitka	1	of 3	33.3%	0.6	0.1 – 1.6	0.6	0.8 ± 0.8	0.6 – 1.0
Adak	1	of 1	100%	1.6	1.6	1.6	1.6	1.0
Rockweed								
Amchitka	27	of 27	100%	35.0 – 144		75.7	81.6 ± 30.3	1.0
Adak	18	of 18	100%	45.5 – 144		77.2	79.0 ± 25.9	1.0
Gull Eggs (no eggs found on Adak)								
Amchitka	1	of 1	100%	0.6		0.6	0.6	1.0
Dolly Varden								
Amchitka	0	of 1	ND		1.3			1.0
Adak	1	of 1	100%	0.9	0.9	0.9	0.9	1.0

MDC – Minimum Detectable Concentration; SD – Standard Deviation. Statistics computed with values = MDC for nondetect
The second range column—"Range of all Results"—includes U-flagged (< MDC) results. This column is left blank for those species/media with 100% detection frequencies. Duplicate samples were collected for Dragon Kelp (3 Amchitka/2 Adak); Rockfish (4/1); greenling (3/2); halibut (0/1); and rockweed (3/2). The maximum result for each duplicate pair was used.

Table 11. Descriptive Statistics for ^{235}U

All units in pCi/kg wet weight.

Species / Area	No. of Detects (% > MDC)	Range	Median	Mean ± SD	Range of MDCs
Dragon Kelp					
Amchitka	27 of 27 100%	0.41 – 1.5	0.80	0.86 ± 0.32	0.0002 – 0.001
Adak	18 of 18 100%	0.27 – 1.62	0.62	0.71 ± 0.34	0.0002 – 0.001
Sea Urchin					
Amchitka	9 of 9 100%	0.57 – 0.83	0.75	0.72 ± 0.10	0.0004 – 0.001
Adak	6 of 6 100%	0.20 – 0.83	0.67	0.61 ± 0.22	0.001
Horse Mussel					
Amchitka	9 of 9 100%	0.53 – 2.86	1.63	1.70 ± 0.76	0.0004 – 0.010
Adak	6 of 6 100%	0.29 – 1.75	0.99	1.03 ± 0.58	0.0002 – 0.000
Chiton					
Amchitka	9 of 9 100%	0.12 – 1.14	0.89	0.81 ± 0.31	0.0003 – 0.001
Adak	6 of 6 100%	0.15 – 0.99	0.39	0.52 ± 0.36	0.0003 – 0.000
Rockfish					
Amchitka	26 of 26 100%	0.08 – 0.60	0.30	0.33 ± 0.16	0.0003 – 0.001
Adak	15 of 15 100%	0.04 – 0.48	0.11	0.17 ± 0.14	0.0002 – 0.001
Greenling					
Amchitka	27 of 27 100%	0.08 – 0.39	0.20	0.21 ± 0.08	0.0003 – 0.001
Adak	18 of 18 100%	0.05 – 0.31	0.15	0.16 ± 0.08	0.0002 – 0.001
Irish Lord					
Amchitka	27 of 27 100%	0.09 – 0.68	0.21	0.24 ± 0.14	0.0003 – 0.001
Adak	18 of 18 100%	0.06 – 0.55	0.16	0.22 ± 0.14	0.0004 – 0.001
Octopus					
Amchitka	3 of 3 100%	0.37 – 0.77	0.39	0.51 ± 0.23	0.0002 – 0.000
Adak	1 of 1 100%	0.45	0.45	0.45 ±	0.000
Pacific Cod					
Amchitka	3 of 3 100%	0.03 – 0.09	0.08	0.07 ± 0.03	0.000
Adak	2 of 2 100%	0.05 – 0.06	0.06	0.06 ± 0.01	0.0002 – 0.000
Halibut					
Amchitka	3 of 3 100%	0.01 – 0.03	0.01	0.02 ± 0.01	0.0002 – 0.001
Adak	1 of 1 100%	0.04	0.04	0.04	0.001
Rockweed					
Amchitka	27 of 27 100%	1.2 – 5.1	2.6	2.9 ± 1.1	0.0002 – 0.001
Adak	18 of 18 100%	1.6 – 5.1	2.7	2.8 ± 0.65	0.0003 – 0.001
Gull Eggs (Adak not sampled)					
Amchitka	1 of 1 100%	0.0007	0.0007	0.0007	0.0002
Dolly Varden					
Amchitka	1 of 1 100%	0.01	0.01	0.01	0.0004
Adak	1 of 1 100%	0.02	0.02	0.02	0.0002

MDC – Minimum Detectable Concentration; SD – Standard Deviation.

Duplicate samples were collected for Dragon Kelp (3 Amchitka/2 Adak); Rockfish (4/1); greenling (3/2); halibut (0/1); and rockweed (3/2). The maximum result for each duplicate pair was used for this summary.

Table 12. Descriptive Statistics for ^{238}U

All units in pCi/kg wet weight.

Species / Area	No. of Detects (% > MDC)	Range	Median	Mean ± SD	Range of MDCs
Dragon Kelp					
Amchitka	27 of 27 100%	9.6 – 35.4	18.7	20.2 ± 7.6	0.001 – 0.003
Adak	18 of 18 100%	6.3 – 38.2	14.7	16.8 ± 8.0	0.001 – 0.002
Sea Urchin					
Amchitka	9 of 9 100%	13.5 – 19.5	17.7	17.0 ± 2.3	0.002
Adak	6 of 6 100%	4.7 – 19.3	15.5	14.3 ± 5.2	0.002
Horse Mussel					
Amchitka	9 of 9 100%	12.2 – 67.1	38.2	40.0 ± 17.8	0.002 – 0.043
Adak	6 of 6 100%	6.8 – 41.1	23.2	24.1 ± 13.6	0.001 – 0.002
Chiton					
Amchitka	9 of 9 100%	2.9 – 26.8	20.9	18.9 ± 7.1	0.001 – 0.002
Adak	6 of 6 100%	3.6 – 23.2	9.3	12.3 ± 8.3	0.001 – 0.002
Rockfish					
Amchitka	26 of 26 100%	1.9 – 14.2	7.1	7.8 ± 3.8	0.001 – 0.003
Adak	15 of 15 100%	1.0 – 11.4	2.7	4.0 ± 3.3	0.001 – 0.003
Greenling					
Amchitka	27 of 27 100%	1.8 – 9.1	4.8	4.8 ± 1.9	0.001 – 0.002
Adak	18 of 18 100%	1.1 – 7.3	3.5	3.8 ± 1.8	0.001 – 0.002
Irish Lord					
Amchitka	27 of 27 100%	2.0 – 16.1	4.9	5.7 ± 3.2	0.001 – 0.003
Adak	18 of 18 100%	1.5 – 13.0	3.8	5.2 ± 3.5	0.002
Octopus					
Amchitka	3 of 3 100%	8.5 – 18.1	9.3	12.0 ± 5.3	0.001
Adak	1 of 1 100%	10.7	10.7	10.7	0.002
Pacific Cod					
Amchitka	3 of 3 100%	0.8 – 2.1	1.8	1.6 ± 0.7	0.001
Adak	2 of 2 100%	1.2 – 1.38	1.3	1.3 ± 0.1	0.001
Halibut					
Amchitka	3 of 3 100%	0.2 – 0.65	0.25	0.37 ± 0.24	0.001 – 0.002
Adak	1 of 1 100%	0.86	0.86	0.86	0.002
Rockweed					
Amchitka	27 of 27 100%	29 – 121	62.0	68.3 ± 25.8	0.001 – 0.002
Adak	18 of 18 100%	37 – 120	64.5	65.7 ± 21.6	0.001 – 0.002
Gull Eggs (no eggs found on Adak)					
Amchitka	1 of 1 100%	0.015	0.015	0.015	0.001
Dolly Varden					
Amchitka	1 of 1 100%	0.234	0.23	0.23	0.002
Adak	1 of 1 100%	0.363	0.36	0.36	0.001

MDC – Minimum Detectable Concentration; SD – Standard Deviation.

Duplicate samples were collected for Dragon Kelp (3 Amchitka/2 Adak); Rockfish (4/1); greenling (3/2); halibut (0/1); and rockweed (3/2). The maximum result for each duplicate pair was used for this summary.

Uranium isotopes were measured by direct aspiration quadrupole ICP-MS. Acceptable levels of precision were obtained for the vast majority of samples collected and analyzed for this sampling event. The mean reported measurement uncertainties (±1σ) for measurement of ^{234}U, ^{235}U, and ^{238}U were less than ±1 percent, ±1.2 percent, and ± 5.5 percent, respectively. Data obtained for ^{235}U and ^{238}U appear to be of high quality, as evidenced by the internal consistency of $^{235}U/^{238}U$ mass ratios (not reported). The associated uranium isotope mean reported sample measurement MDCs using the total sample mass as supplied and expressed as activity concentrations were 1.2, 0.0004, and 0.002 pCi/kg wet weight, respectively. In practice, the actual quantity of sample used for uranium analysis was much less because high total dissolved solids content limits the instrument's ability to detect. Consequently, the actual mean working MDCs for detection and measurement of ^{234}U, ^{235}U, and ^{238}U were around 0.007, 2×10^{-6}, and 0.0001 pCi, respectively. Analyses performed on mass ratio and concentration standards satisfied all laboratory data quality requirements for both precision and accuracy. Similarly, a series of duplicate measurement met applicable laboratory data quality requirements within the quantifiable capabilities of the technique (LLNL 2012).

6.2 Comparison of the 2004 and 2011 Data

As stated earlier in this section, the 2011 data would be compared qualitatively to CRESP data (CRESP 2005) and will become the basis for future trending to begin in 2016. Appendix L provides a comparison of the CRESP and 2011 data. Table 13 summarizes the marine species sampled in both 2004 and 2011. This table is adapted from Appendix L, Table L-1. This summary is based on a comparison of the range of detected concentrations (≥MDC), as documented in Tables L-2 through L-7. A large proportion of the 2004 results were below MDCs for ^{137}Cs, ^{241}Am, and the plutonium isotopes. Central tendencies (e.g., mean or median concentrations) are not accounted for here. The highlighted cells denote species/isotopes for which 2011 results exceeded 2004 results.

Table 13. Summary of Marine Species Sampled in Both 2004 (CRESP) and 2011

Species	^{137}Cs	^{241}Am	$^{239,240}Pu$	^{234}U	^{235}U	^{238}U
Dragon kelp	X	X	X	X	X	X
Rockweed	X	X	X	X	X	X
Gumboot or Pacific chiton	X	X				
Horse mussel	X	X	X	X	X	X
Sea urchin	X	X				
Rockfish	X	X	X	X	X	X
Red or yellow Irish lord	X	X	X	X	X	X
Rock greenling	X	X				
Pacific halibut	X	X	X	X	X	X
Pacific cod	X	X	X	X	X	X
Octopus	X	X				
Dolly Varden	X	X				
Glaucous-winged gull eggs	X	X				

X — Maximum detected 2011 result > maximum detected 2004 result—^{137}Cs, ^{234}U, and ^{238}U only.

Table 14 is an extract of Appendix L tables, specifically Tables L-2, L-5, and L-7, which summarize only those species/isotopes in which 2011 results exceeded corresponding 2004 results (yellow highlighting). Figure 22 is a graphical presentation of that same information. The bar chart provides a graphical comparison of the data listed in Table 13 and Table 14. For each grouping of data, the maximum is denoted by the darkest bar or column. The following summary can be made regarding comparison of 2004 to 2011 data:

- For ^{137}Cs, 2011 maxima exceeding 2004 results correspond to samples collected from Adak.
- For ^{234}U and ^{238}U, although maximum concentrations were detected in samples from Amchitka (2011), differences between 2004 results are nominal.

Furthermore, with respect to the uranium isotopes, uranium is a naturally occurring element found at low levels in virtually all rock, soil, and water. Uranium found naturally has three isotopes— ^{238}U, ^{235}U, and ^{234}U—with the natural abundance of each of these isotopes, expressed as a percentage, of 99.27, 0.72, and 0.0055, respectively. Uranium in soil and rocks is distributed throughout the environment by wind, rain, and geologic processes. Rocks weather and break down to form soil, and soil can be washed by water and blown by wind, moving uranium into streams and lakes, and ultimately settling out and reforming as rock. The average crustal abundance of uranium is 2.8 parts per million and equates to an activity concentration of 1,781 pCi/kg. This value is 6.5 and 8.4 times greater than the highest reported values of uranium isotopes detected in rockweed on Amchitka and Adak Islands, respectively.

6.3 Comparison of Amchitka and Adak Data Collected in 2011

The data were analyzed to compare the average dry weight concentrations from Amchitka with those from Adak. The Amchitka data were collected from the Long Shot, Cannikin, and Milrow sites. Measurements were below the MDCs in most ^{241}Am and plutonium data for the species rockfish, greenling, Irish lord, cod, halibut, Dolly Varden, gull eggs, and rockweed. To avoid introducing a bias for comparison, the raw data were used in all cases.

This section includes (1) concentration comparisons between sites for each combination of radionuclide and organism, (2) an aggregate comparison between the sites using all the combinations of radionuclide and organism, and (3) comparison of the isotopic concentrations of uranium and plutonium.

The analysis in this section focuses on the difference of the average concentrations, which is directly related to the health risks. In addition, further analysis would include comparing the average and also the standard deviation. For example, the sites might have similar averages but different variability. Tests with nonparametric statistics showed that most data are best handled with the average as the primary statistic.

Table 14. 2011 Results That Exceed 2004 (CRESP) Results

Summary of ^{137}Cs Results: 2004 (CRESP) vs. 2011 Sampling

All units in pCi/kg wet weight.

	2004 (CRESP)				2011			
Species Area[a]	*n*	% > MDC	Range of Detects[b]	Range of MDCs	*n*	% > MDC	Range of Detects[b]	Range of MDCs
Rockfish								
Amchitka	14	14%	3.0 – 5.1	2.5 – 207	26	88%	1.1 – 6.4	0.7 – 2.2
Kiska/Adak	4	25%	3.5	2.6 – 106	15	93%	1.2 – 9.4	0.5 – 2.4
Dolly Varden								
Amchitka	10	20%	18.8 – 21.1	3.0 – 109	1	100%	98	1.0
Kiska/Adak	0				1	100%	447	1.0

Summary of ^{234}U Results: 2004 (CRESP) vs. 2011 Sampling

All units in pCi/kg wet weight.

	2004 (CRESP)				2011			
Species Area[a]	*n*	% > MDC	Range of Detects[b]	Range of MDCs	*n*	% > MDC	Range of Detects[b]	Range of MDCs
Horse Mussel								
Amchitka	6	100%	12 – 75.1	0.8 – 1.4	9	89%	23.4 – 80.8	1.0 – 28
Kiska/Adak	2	100%	8.4 – 12.6	1.0 – 1.0	6	100%	9.7 – 49.8	0.5 – 1.0
Irish Lord								
Amchitka	2	100%	9.9 – 13.1	0.73 – 1.0	27	93%	3.0 – 19.3	1.0 – 2.0
Kiska/Adak	1	100%	15.3	1.0	18	94%	2.9 – 16.0	1.0
Rockweed								
Amchitka	10	100%	50 – 130	0.8 – 1.5	27	100%	35.0 – 144	1.0
Kiska/Adak	4	100%	74 – 140	0.4 – 1.3	18	100%	45.5 – 113	1.0

Summary of ^{238}U Results: 2004 (CRESP) vs. 2011 Sampling

All units in pCi/kg wet weight.

	2004 (CRESP)				2011			
Species Area[a]	*n*	% > MDC	Range of Detects[b]	Range of MDCs	*n*	% > MDC	Range of Detects[b]	Range of MDCs
Horse Mussel								
Amchitka	6	100%	11 – 61.6	0.7 – 1.4	9	100%	12.2 – 67.1	0.002 – 0.04
Kiska/Adak	2	100%	7.5 – 12.6	1.0	6	100%	6.8 – 41.1	0.001 – 0.002

	Maximum Detected ^{137}Cs				Range of MDCs			
	2004		2011		2004		2011	
	AMC	Kiska	AMC	Adak	Min	Max	Min	Max
Rockfish	5.1	3.5	6.4	9.4	2.5	207	0.7	2.2
Dolly Varden	21	ND	98	447	3.0	109	1.0	1.0

	Maximum Detected ^{234}U				Range of MDCs			
	2004		2011		2004		2011	
	AMC	Kiska	AMC	Adak	Min	Max	Min	Max
Horse Mussel	75.1	12.6	80.8	49.8	0.8	1.4	1.0	28.0
Irish Lord	13.1	15.3	19.3	16.0	0.7	1.0	1.0	2.0
Rockweed	130	140	144	113	0.4	1.5	1.0	1.0

	Maximum Detected ^{238}U				Range of MDCs			
	2004		2011		2004		2011	
	AMC	Kiska	AMC	Adak	Min	Max	Min	Max
Horse Mussel	61.6	12.6	67.1	41.1	0.7	1.4	0.001	0.04

AMC – Amchitka; MDC – minimum detectable concentration
All units in pCi/kg wet weight.

Legend:

A B C D

A – Amchitka 2004 max result
B – Kiska 2004 max result
C – Amchitka 2011 max result
D – Adak 2011 max result

A B C D

A – CRESP 2004 min MDC
B – CRESP 2004 max MDC
C – 2011 min MDC
D – 2011 max MDC

Figure 22. 2011 Results That Exceed 2004 Results

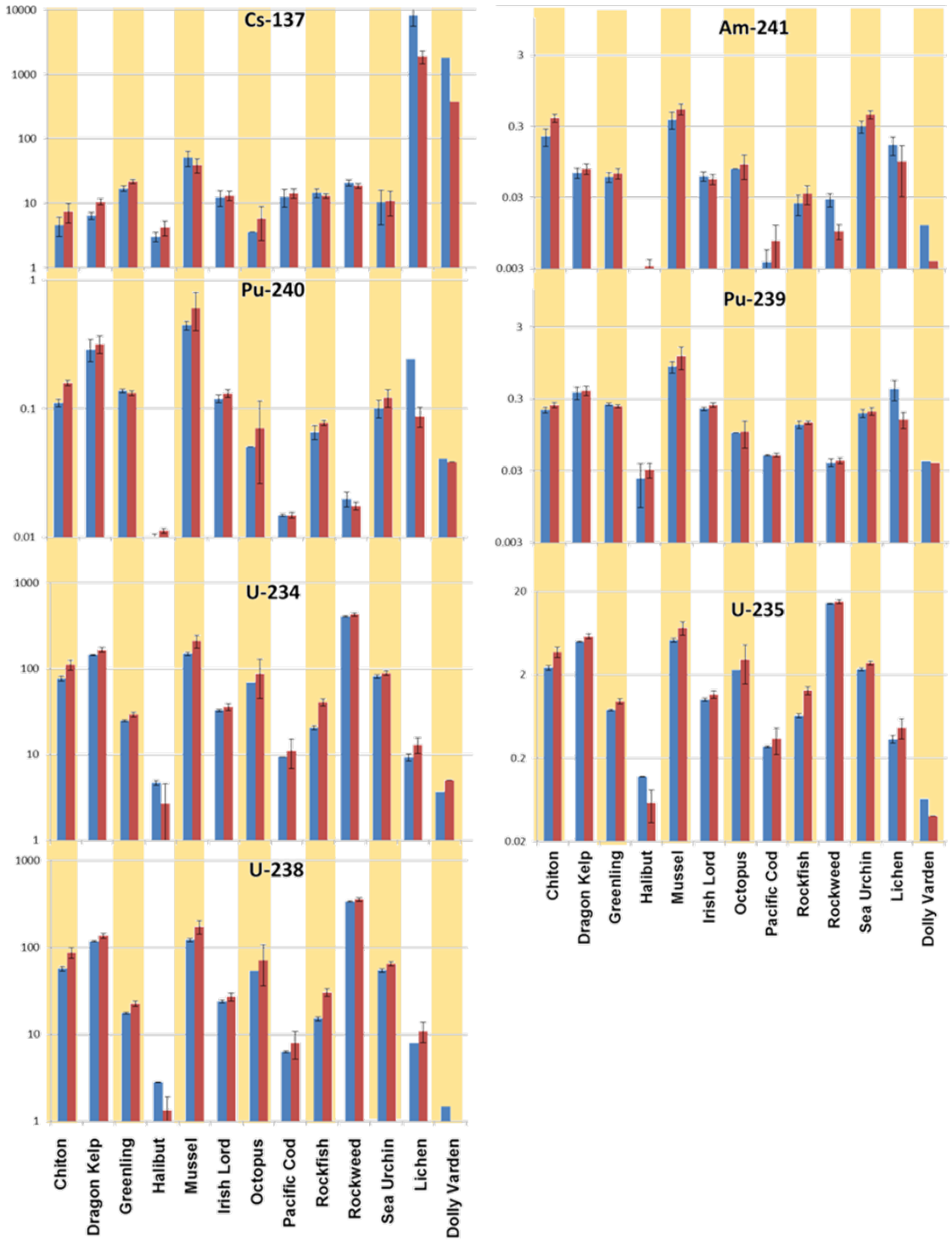
Figure 23 contains dry-weight concentrations at Amchitka and Adak for each radionuclide. Each plot contains the set of species along the horizontal axis. The average concentration from the two sites is compared for each species. Where possible, a standard error of the mean is also displayed. The data indicate a strong possibility of differences between the sites if the difference between the averages (height difference of the columns) is at least twice the combined standard error.

Standard Error: A measure of the uncertainty of the average value is called the standard error of the mean. It is found by first characterizing the range (standard deviation) of the distribution of measurements. Typically, 68 percent of the measurements fall within one standard deviation of the average value. The uncertainty of the average value (the standard error of the mean) is found by dividing the width (standard deviation) by the number of samples minus one. If more samples are taken, the range (standard deviation) should not decrease, but the standard error of the mean does decrease. The standard error is roughly cut in half when the number of measurements quadruples.

Figure 24 shows this measure (ratio of the difference between the sites to the measurement uncertainty, expressed as the combined standard error) for each species and radionuclide. If the bar is above the t-Value = 2 line shown in yellow, then there is a statistical significance between the results, with the higher concentration being at Amchitka (probability of random data having a value of 2 or above is about 2.5 percent). If the bar is below the t-Value = –2 line, also shown in yellow, there is a similar chance that the Adak concentration is higher than the Amchitka concentration.

Figure 24 shows that there are more bars above than below the zero value. This indicates a slight bias towards larger concentration values at Amchitka. It is also expected, based on statistics (p-value = 0.05), that even if the two sites had similar concentrations, 5 percent of the values (i.e., 2 out of 40) are expected to fall either above or below the yellow lines. Actually, six are observed (3 above and 3 below) and are listed in Figure 25. There does not seem to be a pattern, in that each has a different species; each of the radionuclides (except the plutonium isotopes) has one observation higher and one observation lower at Adak compared to Amchitka.

A further test is to compare the distribution of t-Values to that expected from statistically sampling from similar concentrations. Figure 26 shows an expected distribution if the concentrations at the sites are the same (a cumulative normal distribution) compared with the actual distribution based on the data shown in Figure 24. The cumulative distribution is shifted to the right by 0.5, which is the average t-Value, reflecting the bias of more bars on the top. The S portion of the curves match quite well, but the two values (shown as blue diamonds) on the bottom left show the greatest deviation from what is expected. These two values are the ^{238}U concentration in halibut and the ^{241}Am concentration in rockweed. With all the measurements combined in this way, another test can be done. The average t-Value of 0.5 can be compared to the standard error of this measure (with 44 measurements and a standard deviation of slightly larger than 1), resulting in an overall t-Value of approximately 2.4. That is, the shift is over 2 times the shift expected (95 percent) from random sampling, indicating that overall the samples derive from different distributions.



Note: Error bars show the standard error of the mean. Red is Amchitka and blue is Adak.

Figure 23. Comparison of Dry-Weight Concentrations (pCi/kg) at Amchitka and Adak

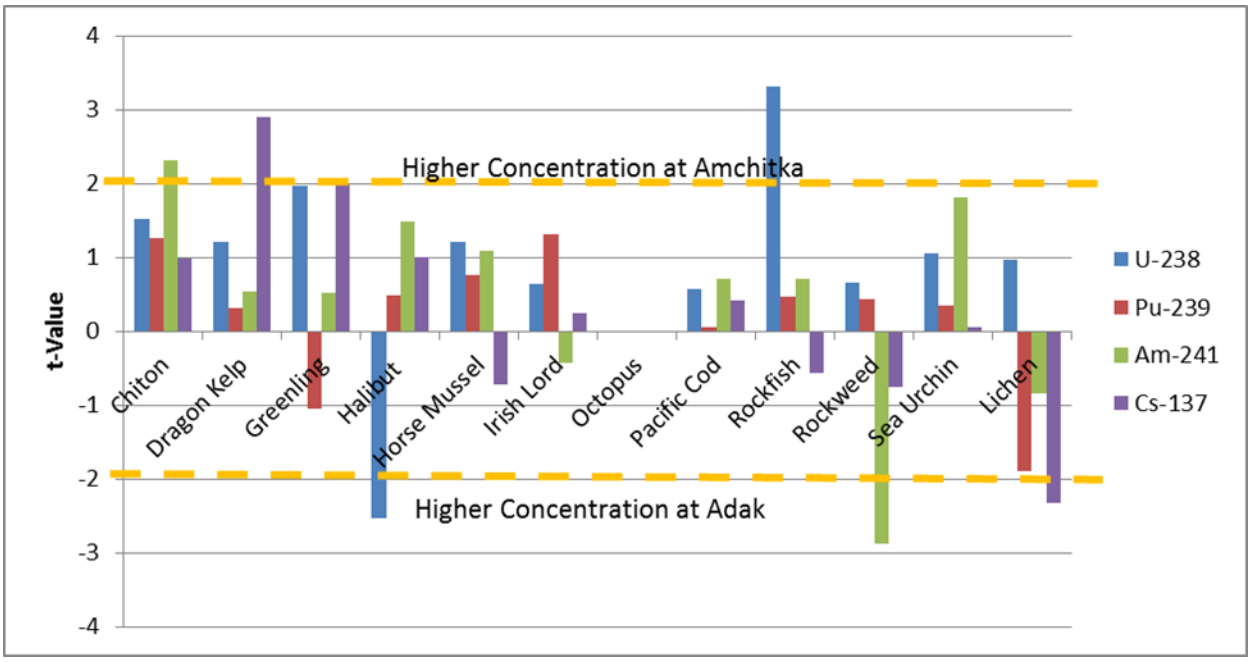


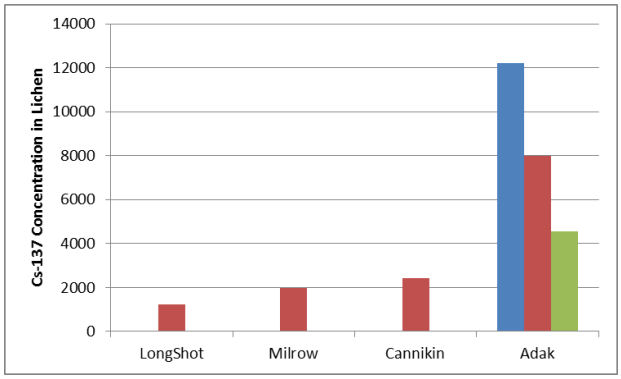
Figure 24. Measure of Difference Between Amchitka and Adak Concentrations

The ratios of the uranium and plutonium isotope concentrations were also analyzed and are shown in Figure 27. The average ratios of the activity concentrations of ^{238}U, ^{235}U, and ^{234}U isotopes are 1: 0.042: 1.3, which is within the variations of natural background (Zielinkaki et al. 1997 and 2008). The activity concentration of ^{240}Pu was about half that of ^{239}Pu. Variations in this ratio were larger between organisms than between sites. This activity ratio corresponds to an atom ratio of 0.14.

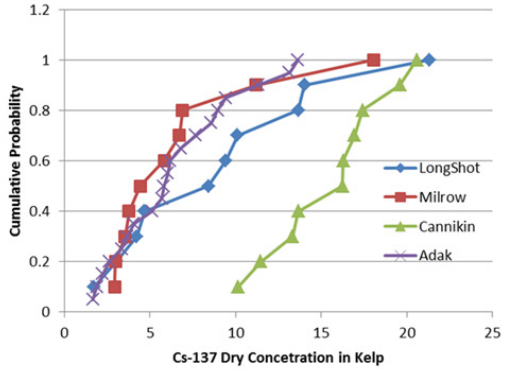
The analysis in this section used statistics based on the variation between samples and the mean of each species. Many factors contribute to uncertainty, including laboratory measurement techniques, sampling techniques, and the limited number of samples, which contributes to the variability observed in the data sets. Contributions of radionuclides in the environment may include naturally occurring radioactivity and anthropogenic influences such as fall-out from previous aboveground tests, nuclear power accidents such as at Fukushima Dai-Ichi, decommissioning submarines in the Arctic Ocean, and potential leaching from underground nuclear tests.

The data analyzed provide sufficient statistical evidence to infer that samples analyzed from both islands are equivalent for each nuclide and organism combination. Overall, there is a pattern toward slightly higher concentration (half a standard error of the mean, for example for uranium) at the Amchitka site. The two measurements that seem to show the most deviation have limited data above the MDCs.

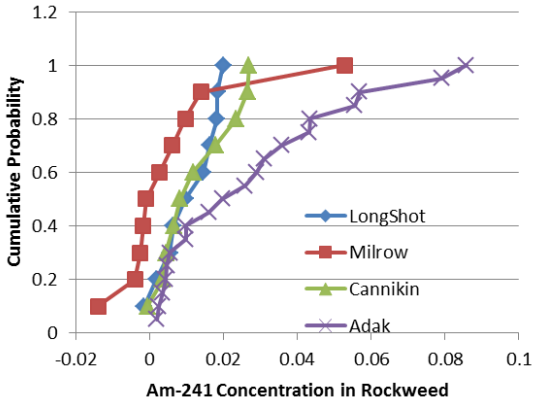
^{137}Cs in Lichen Limited data, with the Adak concentration being about 4 times higher than the Cannikin, Milrow, and Long Shot concentrations.



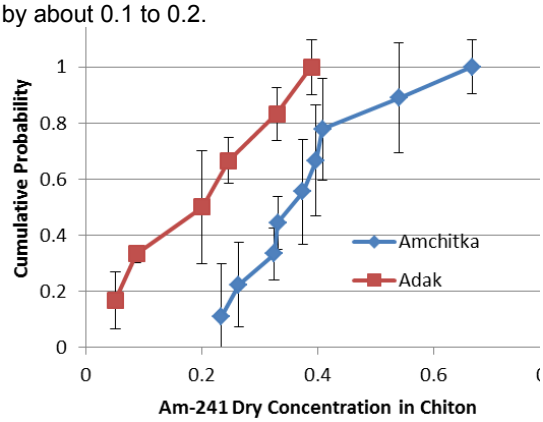
^{137}Cs in Kelp There are a large number of samples. The Cannikin concentration is about 2 times higher than the Adak, Long Shot, and Milrow data as can be seen in the cumulative probability distribution below. Each mark is one measurement.



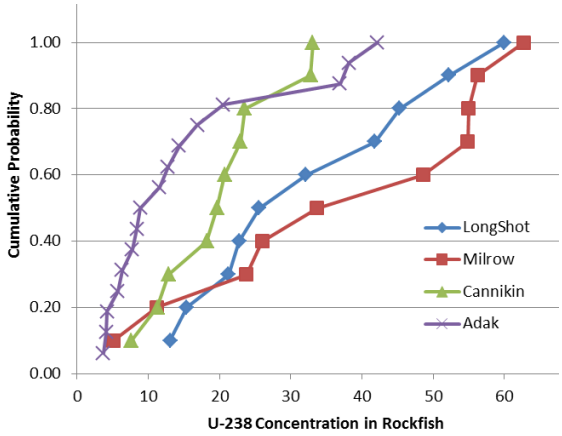
^{241}Am in Rockweed Of these data, only 30% had measurements that were above the MDC. Except for the sample with a large concentration at Milrow, the distributions of Long Shot, Milrow, and Cannikin are similar.



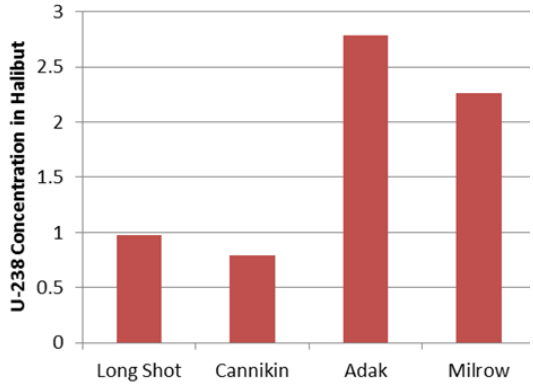
.**^{241}Am in Chiton** Only the lowest Adak concentration measurement was below the detection limit. The cumulative distributions (below) show the Amchitka concentrations shifted by about 0.1 to 0.2.



^{238}U in Rockfish A large number of samples with similar Long Shot and Milrow distributions, which are on average twice the Adak and Cannikin concentrations.

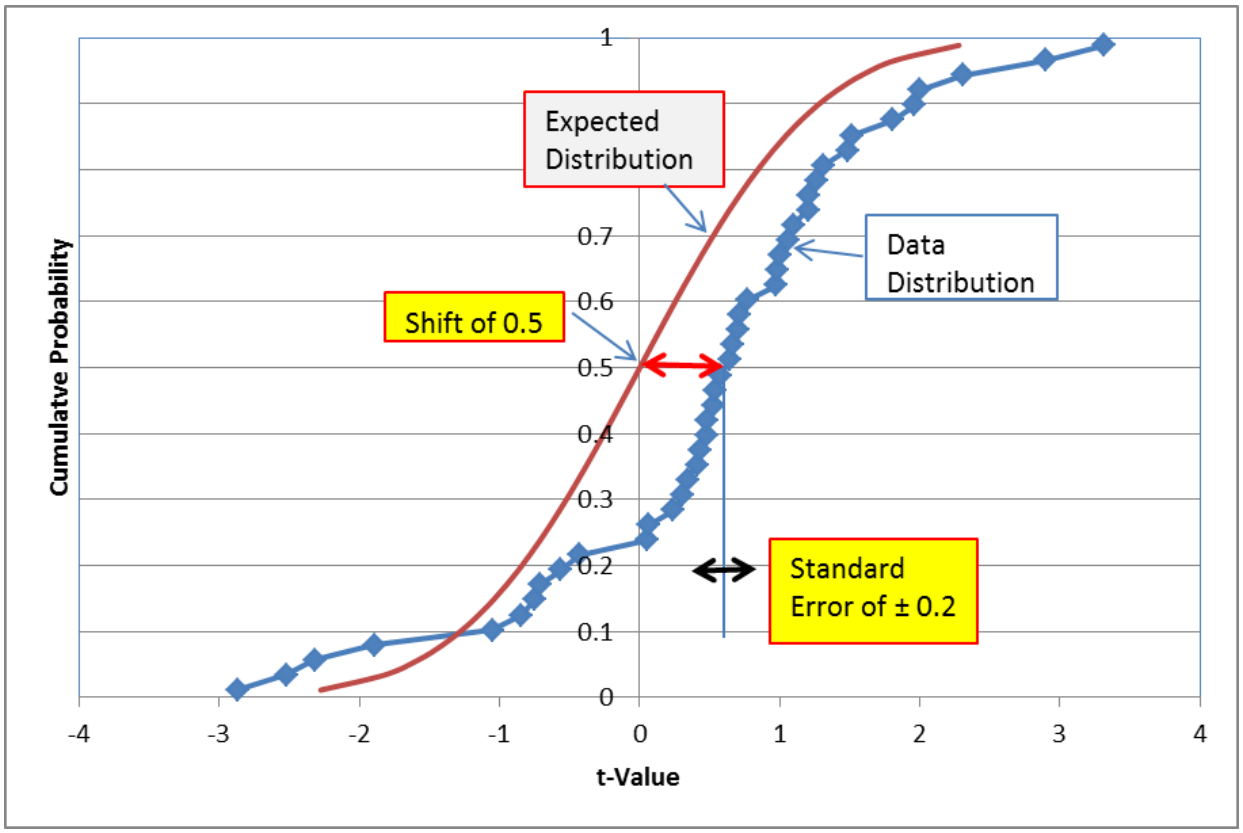


^{238}U in Halibut Limited data (1 sample each site) with similar Adak and Milrow concentrations, which are about 3 times larger than the Cannikin and Long Shot concentrations.



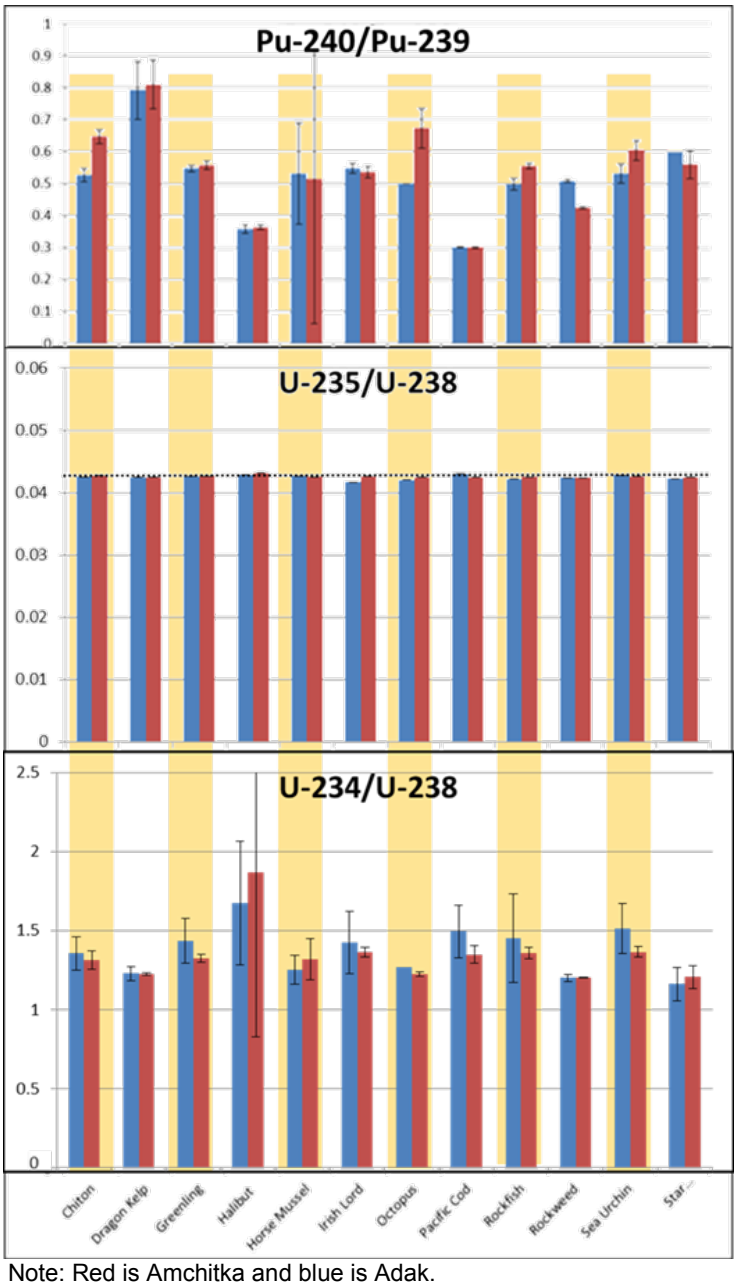
Note: The specific sample measurements are shown for each site. In four cases, the cumulative probability distribution is shown with each marker along a curve representing one of the measurements at that site.

Figure 25. Measurements of Isotopes and Species That Showed Statistically Significant Differences ($p < 0.05$)



Note: This includes data from each nuclide and organism combination. The red curve is what is expected (i.e., a normal distribution around 0 with a standard deviation of 1.0). The blue curve is what is observed.

Figure 26. Cumulative Probability Distribution of the Ratio of Differences Between Sites to the Standard Error



Note: Red is Amchitka and blue is Adak.

Figure 27. Measure of Amchitka and Adak Plutonium and Uranium Isotope Concentrations

6.4 Comparison of 2011 Data with CRESP 2004 Data, Literature Sources, and Food Standards

A further evaluation of food safety was performed by comparing the radionuclide concentration data from this monitoring program to established food safety standards for each of the isotopes and to average values obtained in other studies. Table 15 compares Amchitka data to worldwide values, food safety standards, and CRESP's 2004 results. The second and third columns list the range of values for fish from the Northern Hemisphere sites generally and from the contaminated Irish Sea near Sellafield, England. The next two columns present the values for Amchitka in 2011 and CRESP's study in 2004. The next two columns are the Food and Drug Administration's (FDA's) minimum reporting level (MRL), which is the minimum concentration reported in the FDA food surveys (values below this are reported as zero), and the FDA Derived Intervention Level (DIL), which is a guidance level for food that is imported into the United States (FDA 2009). The DIL for radionuclides is based on short-term rather than lifetime exposure. The last column is the Codex Alimentarius Committee of the Food and Agriculture Organization (FAO) and World Health Organization's (WHO) food safety values for radionuclides and is intended to screen food sources as acceptable for consumption for a 1-year time frame (FAO/WHO 2004).

Table 15. Comparison of Amchitka Data to Worldwide Values and Food Safety Standards

Isotope	Northern Hemisphere (range)	Irish Sea (range)	Amchitka 2004 (range)	Amchitka 2011 (range)[a]	FDA MRL	FDA DIL	Codex Guide
^{137}Cs	8.9–10.8	8.4–297.3	<MDC–16.3 3.8–16.7[b]	0.82–9.5	135	32,432	27,027
^{241}Am	0.03	0.0027–6.22	<MDC–7.3[c]	0.006–0.07	5405	54.05[d]	27[d]
$^{239\&240}$Pu	0.0081–1.89	0.00035	<MDC–0.595	0.018–0.020[e]	No MRL	54.05[d]	27[d]
^{234}U	0.486	0.0972–0.1405	<MDC–23.162	0.6–19.3	No MRL	No DIL	No guideline
^{235}U	No data	0.00081–0.0081	<MDC–14.32	0.009–0.68	No MRL	No DIL	2702
^{238}U	No data	0.0946–0.1243	<MDC–21.05	0.2–16.1	No MRL	No DIL	No guideline

All results in pCi/kg wet weight.
[a] Range of means for Irish lord, rockfish, rock greenling, Pacific cod, and halibut
[b] Range of means for four species (Dolly Varden, walleye pollock, halibut, and Pacific cod)
[c] For all actinides, bone was analyzed as a conservative measure
[d] Totals for all Am and Pu isotopes
[e] Only two detects and only in rock greenling

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7.0 Human Health—Subsistence- and Commercial-Catch Seafood Consumption

The first DQO for the 2011 sampling event was to collect data to determine if subsistence- and commercial-catch seafood that is part of the Aleut diet continues to be safe to eat. The 2011 sampling event provides the first set of data to address the objectives of the LTS&M Plan (DOE 2008). As stated in the 2011 Sampling Plan (DOE 2011), results from the 2011 sampling event would be used to provide estimates of potential human health risk from the ingestion of seafood harvested or obtained through commercial catch on or near Amchitka. These data would be compared to data from Adak that were also collected during the 2011 sampling event. Adak is considered a reference location for the 2011 sampling effort. In addition, the 2011 data would also be compared qualitatively to CRESP (2005) data and will also become the basis for future trending to begin in 2016. Appendix L presents a comparison of the CRESP and 2011 data.

In addition to results of tissue analysis, other important input parameters for estimating human health risk from ingestion of seafood include (1) Aleut diet information, which was used to guide selection of the species collected for the sampling event in 2011 but also is used in this report to develop representative intake amounts for the various seafood species, (2) exposure frequency—how often the seafood is ingested, (3) exposure duration—how many days/years ingested, and (4) ingestion toxicity information of the radionuclides of interest.

Potential adverse health effects associated with radionuclides under normal environmental exposure conditions (as opposed to catastrophic conditions) are primarily caused by the radiation the radionuclides emit while undergoing radioactive decay. The radiation can transfer sufficient localized energy to atoms and remove electrons from the electric field of their nucleus (ionization). With ingestion of food containing radionuclides, this transfer of energy can adversely affect the cells of biological tissues, and depending on the extent of potential damage, it could result in adverse health effects. The principal adverse health effects from low-level radiological exposures (which are typical for normal environmental exposures) are carcinogenicity, mutagenicity, and teratogenicity.

Carcinogenicity is the ability to cause cancer, which has been observed on both human and laboratory animals under relatively high doses or high dose rate of exposures. Studies of human populations exposed to low doses or low dose rates, such as those under normal environmental exposure conditions, have not adequately provided definitive risk information. Therefore, the potential cancer risks associated with low dose/dose rate exposures are estimated by extrapolating the data for high dose/dose rate exposures assuming a linear relationship between dose and risk and that there is no threshold. It is considered that radiation-induced cancers (both fatal and nonfatal) can occur at any point in a person's lifetime.

Mutagenicity is the ability to induce genetic mutation, which may be in the nucleus of either somatic (body) or germ (reproductive) cells. However, very few quantitative data are available on radiogenic mutations in humans, particularly from low-dose exposures, due to the mild mutagenic effects or similarities of the mutagenic effects to nonmutagenic effects. The frequency of serious genetic impairment caused by radiation is relatively small compared to that of the spontaneously arising genetic diseases (UNSCEAR 1982, 1988). The vast majority of data on radiation-induced mutation came from extensive animal studies in laboratories, and the results were extrapolated to humans. The risk of mutation per unit exposure is smaller than, or

comparable to, the risk of cancer (EPA 1989). Moreover, radiation exposures to induce genetic mutation must occur during the 30-year period of reproductive generation.

Teratogenicity is the ability to induce birth defects during the growth and development of an embryo. Although the risks per unit radiation exposure of serious teratogenic effects are greater than the risks of cancer, the radiation exposures to induce teratogenic effects must occur over a specific period during pregnancy, which is limited to 9 months.

On the basis of the length of induction periods and the severity of potential adverse effects, EPA determined that cancer risks appear to be the limiting risks and may be used as the sole basis for assessing human health effects from environmental radiation exposures (EPA 1989).

Besides radiation effects, some radioactive materials can cause adverse health effects by their chemical toxicities if their intake rates exceed specific threshold values. Based on the levels of exposure that are detailed in the following section, the intake rates would be much lower than the threshold values and, therefore, would not likely result in adverse health effects due to chemical toxicity.

Hence, the assessment of potential health risks resulting from seafood ingestion conducted for this report focused on the cancer risks associated with the radiation emitted by radionuclides of concern in the seafood.

7.1 Diet Information Review

Diet intake surveys previously conducted at four Alaska Native Villages—St. Paul, Atka, Nikolski, and Unalaska (Bartell et al. 1999; Hamrick et al. 2003; Hamrick and Smith 2003) were used for developing an Aleut diet for estimating the potential risk of ingesting seafood harvested (both from a subsistence and commercial basis) from Amchitka by an Aleut in Alaska. An average daily intake rate of seafood and the corresponding types or particular marine species (or distributions) that this intake comprised were determined by compositing the information from the survey data for the four villages. First, the total and species-specific intake rates were determined for each of the four villages assessed, these were then weighted by the number of villagers that participated in each of the surveys to obtain the total and species-specific intake rates for the composite diet. These average daily intake rates and distributions were used with radionuclide concentrations measured in marine species (or obtained from literature as in the case of salmon, or derived, as in the case of seal and sea lion) to estimate the potential risks associated with seafood ingestion. For ease of discussion, this Aleut diet will be referred to as the "composite diet" for the remainder of this section.

In addition to the composite diet, diet information for each of the four villages (as reported in the survey references mentioned above) was used to calculate the potential risk to an Aleut consuming seafood harvested from Amchitka. This was done to provide estimates reflecting a range of diets that include varying types of seafood and amounts of intake reflected in the survey data. It is noted that the villages (Atka, Nikolski, Unalaska, and St. Paul) that have survey data are a distance away from Amchitka and that the seafood being consumed at these villages would likely come from sources other than Amchitka. (No samples were collected from waters near these villages, as it is not within the scope and objective for LM's Amchitka project.)

For the Atka diet data, diet information in terms of grams per day (g/day) (Bartell et al. 1999) were reported for three survey periods—June to September 1998, June to December 1998, and January to April 1999. Because the first period overlaps with the second period, the data for the second period were used, whenever available, with those for the third period to determine the average intake rates. The reported average daily intake rates for responders were used. Although the intake assessments do not cover an entire year, it is assumed that the diet pattern was applicable for the entire year.

The diet data for St. Paul (Hamrick et al. 2003), Nikolski, and Unalaska (Hamrick and Smith 2003) were reported as intake frequency expressed as the number of portions per year. Those results were multiplied by the corresponding amount in grams per portion, and then divided by 365 days per year to obtain the average daily intake rates in grams per day. For intake of seal and sea lion oil, each portion was assumed to be 1 tablespoon (equivalent to 0.5 fluid ounce with a density of 0.8 gram per cubic centimeter). Similar to the Atka diet data, the reported average frequencies for responders were used in the calculations.

For estimating potential health risks associated with seafood ingestion, the average daily intake rate of each seafood item is based on wet weight. The intake rates of dried seafood items, such as dried or smoked salmon, were converted to wet weight using the same wet weight to dry weight ratios determined from the 2011 sampling data (Hamilton et al. 2012a).

For a particular species of which multiple varieties are included in the diet, such as salmon for the St. Paul diet, the intake rates for silver, chum, red, king, and pink salmon, including dried, smoked, salted, cooked, or frozen, were all combined to give the total intake rate for salmon. This approach was necessary to provide a common basis for developing ingestion rates of different species with different sets of diet data because the level of detail regarding the varieties of species consumed is not similarly provided in the four diet survey data sets. The total intake rates derived for the 17 fish species are shown in Table 16. On the basis of these species-specific intake rates, the total seafood intake rate over all species was determined, and the distributions of the total intake rate among different species were calculated.

The intake rates for the composite diet and those for the four villages presented in Table 16 represent the seafood diet of an average adult because all the participants of the diet surveys were either males or females 15 years or older, except for a small number of younger participants in part of the Atka diet survey (Bartell et al. 1999).

Table 16. Average Daily Intake Rates and Distributions of Seafood

Seafood item	Atka Diet		Nikolski Diet		Unalaska Diet		St. Paul Diet		Composite Diet	
	Avg. intake rate (g/day)	% of total intake rate	Avg. intake rate (g/day)	% of total intake rate	Avg. intake rate (g/day)	% of total intake rate	Avg. intake rate (g/day)	% of total intake rate	Avg. intake rate (g/day)	% of total intake rate
Fish, total	100	63	520	89	140	77	10	43	100	76
Halibut	19	12	160	28	30	17	5.2	22	27	20
Dolly Varden	1.0	0.61	19	3.3	1.2	0.67	–[a]	–	1.9	1.4
Cod	10	6.3	11	1.9	4.6	2.6	0.080	0.34	3.9	2.8
Salmon	55	33	330	56	98	55	4.9	21	67	49
Others	18	11	1.4	0.23	2.0	1.1	–	–	3.3	2.4
Mollusk and crustacean, total	7.0	4.3	14	2.4	12	6.7	1.5	6.6	6.8	5.0
Octopus	3.9	2.4	1.9	0.32	1.1	0.63	0.19	0.81	1.1	0.84
Sea urchin	1.7	1.0	0.93	0.16	1.1	0.62	0.32	1.4	0.82	0.60
Mussels	–	–	5.4	0.93	0.090	0.051	0.012	0.051	0.43	0.31
Bidarkis	1.5	0.91	5.4	0.93	0.21	0.12	–	–	0.67	0.49
Shrimp	–	–	0.12	0.021	1.2	0.70	–	–	0.44	0.32
Crabs	–	–	0.53	0.091	6.7	3.8	1.0	4.3	2.8	2.0
Clams	–	–	–	–	1.4	0.79	–	–	0.48	0.35
Seabird eggs	0.60	0.37	2.9	0.50	0.30	0.17	1.0	4.3	0.84	0.62
Seaweed/kelp	0.10	0.061	–	–	–	–	–	–	0.014	0.010
Seals	15	9.1	9.8	1.7	5.1	2.9	8.9	38	8.5	6.2
Sea lions	32	20	5.9	1.0	2.8	1.6	1.6	7.0	6.6	4.9
Sea birds	5.2	3.2	31	5.3	21	12	0.29	1.2	10	7.5
Total (g/day)	**160**		**580**		**180**		**24**		**140**	

[a] "–" = Not available

7.2 Risk Estimations

Potential risk associated with ingestion of seafood was estimated with the following equation:

$$Risk = \sum_i SF_i \times \sum_j (Intake_j \times C_{i,j}) \times 10^{-3} \times EF \times ED$$

Where:

$Risk$ = Excess lifetime cancer risk resulting from ingestion of seafood,
SF_i = Slope factor for radionuclide i (1/pCi),
i = Index for radionuclides,
j = Index for marine species,
$Intake_j$ = Total daily intake rate attributed to marine species j (g/day),
$C_{i,j}$ = Concentration of radionuclide i in marine species j, wet-weight based (pCi/kg),
10^{-3} = Unit conversion factor (kg/g),
EF = Exposure frequency (days/year) (365), and
ED = Exposure duration (years) (30).

The assumed daily intake amount or rate for each marine species for the composite diet and for each of the four villages is based on the diet information presented in Table 16 and therefore varied with each village. Exposure frequency and exposure duration are conservatively assumed to be 365 days/year and 30 years, respectively. Slope factors used are those developed by EPA for use in estimating cancer risk. Radionuclide concentrations (or exposure point concentrations [EPCs]) for each species are based on the 2011 sampling data. Sections 7.2.1 and 7.2.2 provide more discussion on the slope factors and the radionuclide concentrations or EPCs used.

7.2.1 Slope Factors

To calculate potential cancer risks associated with seafood consumption, the EPA risk coefficients, known as slope factors (specific for the ingestion pathway), were used. EPA has developed pathway-specific slope factors for use in risk assessments. These slope factors are estimates of potential cancer risk per unit intake of radionuclides that were developed with considerations of age- and sex-specific factors for individual organs, along with organ-specific radiation absorbed doses. The slope factors are characterized as best-estimate values of the age-averaged lifetime excess cancer risk per unit of intake for the radionuclides of concern. Detailed information on the derivation of slope factors and their application are available in several EPA documents (EPA 1991a,b; 1994, 1997; Eckerman et al. 1999). The method used in this human health risk assessment follows EPA risk assessment guidance (EPA 1991a; 1997).

The ingestion slope factor of a radionuclide provides an estimate of the potential lifetime excess cancer risk that could result from intake of 1 pCi of that radionuclide. These slope factors were obtained from EPA Federal Guidance Report No. 13 (Eckerman et al. 1999) and are listed in Table 17. In the table, "+D" designations as applied to ^{137}Cs, ^{235}U, and ^{238}U, indicate that the potential risks contributed by the respective short-lived decay progenies (with a radioactive half-life less than 6 months) for each radionuclide were included in the values listed for these three radionuclides. It was assumed that concentrations of short-lived radionuclides in the various marine species were the same as the concentrations of their parent radionuclides, that is, the short-lived radionuclides are in secular equilibrium with the parent radionuclides.

Table 17. Radionuclide Slope Factors Used for Estimating Risk for the Ingestion Pathway

SF (1/pCi)	Radionuclide						
	^{241}Am	^{137}Cs +D	^{239}Pu	^{240}Pu	^{234}U	^{235}U +D	^{238}U +D
	1.34×10^{-10}	3.74×10^{-11}	1.74×10^{-10}	1.74×10^{-10}	9.55×10^{-11}	9.76×10^{-11}	1.21×10^{-10}

7.2.2 Exposure Point Concentrations or Radionuclide Concentrations in Marine Species

The EPCs of radionuclides used for the risk calculations were determined on the basis of Amchitka and Adak 2011 sampling data as presented in previous sections. The wet-weight concentrations from the laboratory analyses of the samples of the various species collected are considered to be the average value for the whole body of each sample for the various species. Table 18 and Table 19 present the maximum and the 95 percent upper confidence limit of the mean (UCL_{95}) values, respectively, of the Amchitka data set. Table 20 and Table 21 present the maximum and UCL_{95} values for Adak. Depending on the availability of sampling data, different methods were used to develop EPCs or radionuclide concentrations in the various species. The following sections provide more discussions on the different methods used.

Table 18. Risk Calculation EPCs—Maximum Values of the Amchitka 2011 Sampling Data

Species Considered for Intake	Radionuclide						
	^{241}Am	^{137}Cs	^{239}Pu	^{240}Pu	^{234}U	^{235}U	^{238}U
Halibut[a]	0.002	1.5	0.01	0.003	1.8	0.03	0.65
Dolly Varden[a]	0.002	98	0.01	0.01	1.3	0.01	0.23
Cod[a]	0.004	3.8	0.01	0.003	3.0	0.09	2.1
Salmon[b]	0.01	8.5	0.01	0.006	17	0.79	15
Other fish[a],	0.07	7.8	0.08	0.04	20	0.60	14
Octopus[a]	0.019	2.1	0.03	0.03	22	0.77	18
Sea urchin[a]	0.20	9.9	0.09	0.07	26	0.83	20
Mussel[a]	0.80	44	2.0	1.0	81	2.9	67
Bidarkis (chiton)[a]	0.14	4.1	0.07	0.04	32	1.1	27
Shrimp[b]	0.03	12	0.07	0.04	15	0.53	12
Crabs[b]	0.03	12	0.07	0.04	15	0.53	12
Clams[a]	0.80	44	2.0	1.0	81	2.9	67
Sea birds[b]	0.02	110	0.32	0.16	62	2.1	50
Sea bird eggs[a]	0.01	12	0.07	0.04	0.80	0.001	0.02
Seaweed[a]	0.03	5.8	0.16	0.13	140	5.1	120
Seal[b]	0.02	50	0.77	0.39	6.2	0.21	5.0
Sea lion[b]	0.02	50	0.77	0.39	6.2	0.21	5.0

Units are pCi/kg

[a] EPCs were determined based on sampling data. For other fish, they are based on data for greenling, Pacific cod, and rockfish. For sea bird eggs, they are based on data for gull eggs and goose eggs. For seaweed, they are based on data for dragon kelp and rockweed. For clams, they are based on data for mussels.

[b] EPCs were derived using surface water concentrations and bioaccumulation factors (BAFs). For salmon, EPCs were derived based on water concentrations in the North Pacific Ocean reported in the literature (for ^{241}Am, Lee et al. 2003, for ^{137}Cs, Kamenik et al. 2013, for ^{239}Pu and ^{240}Pu, Provinec et al. 2005, and for ^{234}U, ^{235}U, and ^{238}U, Ku et al. 1977). EPCs for shrimp, crab, sea bird, seal, and sea lion are based on water concentrations derived from tissue concentrations of species collected in 2011 from Amchitka.

Table 19. Risk Calculation EPCs—UCL_{95} Values of the Amchitka 2011 Sampling Data

Species Considered for Intake	Radionuclide						
	^{241}Am	^{137}Cs	^{239}Pu	^{240}Pu	^{234}U	^{235}U	^{238}U
Halibut[a]	0.002	1.5	0.01	0.003	1.8	0.03	0.65
Dolly Varden[a]	0.002	98	0.01	0.01	1.3	0.01	0.23
Cod[a]	0.004	3.8	0.01	0.003	3.0	0.09	2.1
Salmon[b]	0.01	8.5	0.01	0.006	17	0.79	15
Other fish[a],	0.04	7.7	0.07	0.04	13	0.44	10
Octopus[a]	0.019	2.1	0.03	0.03	22	0.77	18
Sea urchin[a]	0.17	8.2	0.08	0.06	26	0.83	20
Mussel[a]	0.51	29	1.2	0.61	76	2.7	64
Bidarkis (chiton)[a]	0.14	4.1	0.07	0.04	32	1.1	27
Shrimp[b]	0.03	12	0.07	0.04	15	0.53	12
Crabs[b]	0.03	12	0.07	0.04	15	0.53	12
Clams[a]	0.51	29	1.2	0.61	76	2.7	64
Sea birds[b]	0.02	110	0.32	0.16	62	2.1	50
Sea bird eggs[a]	0.01	12	0.07	0.04	0.80	0.001	0.02
Seaweed[a]	0.02	4.2	0.09	0.07	104	3.7	86
Seal[b]	0.02	50	0.77	0.39	6.2	0.21	5.0
Sea lion[b]	0.02	50	0.77	0.39	6.2	0.21	5.0

Units are pCi/kg

[a] EPCs were determined based on sampling data. For other fish, they are based on data for greenling, Pacific cod, and rockfish. For sea bird eggs, they are based on data for gull eggs and goose eggs. For seaweed, they are based on data for dragon kelp and rockweed. For clams, they are based on data for mussels.

[b] EPCs were derived using surface water concentrations and bioaccumulation factors (BAFs). For salmon, EPCs were derived based on water concentrations in the North Pacific Ocean reported in the literature (for ^{241}Am, Lee et al. 2003, for ^{137}Cs, Kamenik et al. 2013, for ^{239}Pu and ^{240}Pu, Provinec et al. 2005, and for ^{234}U, ^{235}U, and ^{238}U, Ku et al. 1977). EPCs for shrimp, crab, sea bird, seal, and sea lion are based on water concentrations derived from tissue concentrations of species collected in 2011 from Amchitka.

Table 20. Risk Calculation EPCs—Maximum Values of the Adak 2011 Sampling Data

Species Considered for Intake	Radionuclide						
	^{241}Am	^{137}Cs	^{239}Pu	^{240}Pu	^{234}U	^{235}U	^{238}U
Halibut[a]	0.002	1.0	0.01	0.003	1.60	0.04	0.86
Dolly Varden[a]	0.003	450	0.01	0.01	0.90	0.02	0.36
Cod[a]	0.002	3.0	0.01	0.003	1.90	0.06	1.4
Salmon[b]	0.01	8.5	0.01	0.006	17	0.79	15
Other fish[a],	0.04	9.4	0.07	0.04	13	0.48	11
Octopus[a]	0.015	0.70	0.02	0.01	14	0.45	11
Sea urchin[a]	0.12	9.4	0.07	0.04	29	0.83	19
Mussel[a]	0.15	15	0.20	0.10	50	1.8	41
Bidarkis (chiton)[a]	0.08	1.5	0.06	0.03	33	0.99	23
Shrimp[b]	0.03	9.9	0.03	0.02	9.4	0.33	7.9
Crabs[b]	0.03	9.9	0.03	0.02	9.4	0.33	7.9
Clams[a]	0.15	15	0.20	0.10	50	1.8	41
Sea birds[b]	0.02	90	0.13	0.07	38	1.3	31
Sea bird eggs[c]	–	–	–	–	–	–	–
Seaweed[a]	0.03	7.3	0.11	0.09	140	5.1	120
Seal[b]	0.02	41	0.32	0.17	3.8	0.13	3.1
Sea lion[b]	0.02	41	0.32	0.17	3.8	0.13	3.1

Units are pCi/kg

[a] EPCs were determined based on sampling data. For other fish, they are based on data for greenling, Pacific cod, and rockfish. For seaweed, they are based on data for dragon kelp and rockweed. For clams, they are based on data for mussels.

[b] EPCs were derived using surface water concentrations and bioaccumulation factors (BAFs). For salmon, EPCs were derived based on water concentrations in the North Pacific Ocean reported in the literature (for ^{241}Am, Lee et al. 2003, for ^{137}Cs, Kamenik et al. 2013, for ^{239}Pu and ^{240}Pu, Provinec et al. 2005, and for ^{234}U, ^{235}U, and ^{238}U, Ku et al. 1977). EPCs for shrimp, crab, sea bird, seal, and sea lion are based on water concentrations derived from tissue concentrations of species collected in 2011 from Adak.

[c] Sampling data for sea bird eggs are not available, as none were collected on Adak.

Table 21. Risk Calculation EPCs—UCL_{95} Values of the Adak 2011 Sampling Data

Species Considered for Intake	Radionuclide						
	^{241}Am	^{137}Cs	^{239}Pu	^{240}Pu	^{234}U	^{235}U	^{238}U
Halibut[a]	0.002	1.0	0.01	0.003	1.60	0.04	0.86
Dolly Varden[a]	0.003	450	0.01	0.01	0.90	0.02	0.36
Cod[a]	0.002	3.0	0.01	0.003	1.90	0.06	1.4
Salmon[b]	0.01	8.5	0.01	0.006	17	0.79	15
Other fish[a],	0.03	5.4	0.06	0.03	8.4	0.27	6.4
Octopus[a]	0.02	0.70	0.02	0.01	14	0.45	11
Sea urchin[a]	0.12	8.2	0.07	0.04	29	0.83	19
Mussel[a]	0.15	15	0.20	0.10	50	1.8	41
Bidarkis (chiton)[a]	0.08	1.5	0.06	0.03	33	1.0	23
Shrimp[b]	0.03	9.9	0.03	0.02	9.4	0.33	7.9
Crabs[b]	0.03	9.9	0.03	0.02	9.4	0.33	7.9
Clams[a]	0.15	15	0.20	0.10	50	1.8	41
Sea birds[b]	0.02	90	0.13	0.07	38	1.3	31
Sea bird eggs[c]	–	–	–	–	–	–	–
Seaweed[a]	0.02	5.6	0.08	0.06	100	3.6	85
Seal[b]	0.02	41	0.32	0.17	3.8	0.13	3.1
Sea lion[b]	0.02	41	0.32	0.17	3.8	0.13	3.1

Units are pCi/kg

[a] EPCs were determined based on sampling data. For other fish, they are based on data for greenling, Pacific cod, and rockfish. For seaweed, they are based on data for dragon kelp and rockweed. For clams, they are based on data for mussels.

[b] EPCs were derived using surface water concentrations and bioaccumulation factors (BAFs). For salmon, EPCs were derived based on water concentrations in the North Pacific Ocean reported in the literature (for ^{241} Am, Lee et al. 2003, for ^{137}Cs, Kamenik et al. 2013, for ^{239}Pu and ^{240}Pu, Provinec et al. 2005, and for ^{234}U, 235U, and ^{238}U, Ku et al. 1977). EPCs for shrimp, crab, sea bird, seal, and sea lion are based on water concentrations derived from tissue concentrations of species collected in 2011 from Adak.

[c] Sampling data for sea bird eggs are not available, as none were collected on Adak.

7.2.2.1 EPCs for Sampled Species

For the risk estimates discussed in this section, two calculations were performed, one using the maximum concentrations reported, and the other using the UCL_{95} value. The UCL_{95} value was calculated using the EPA recommended method (in particular the Chebyshev Inequality method) (EPA 2002). In addition, for risk estimates using UCL_{95} values, when the number of samples was fewer than 3, the maximum value was used. This approach is consistent with EPA recommendations for small numbers of samples because the calculated UCL_{95} value would likely result in a value not within the range of measured values and likely greater than maximum. In the determination of maximum and UCL_{95} values, the sampling data reported as less than the MDCs were replaced with the MDCs. This would result in a higher UCL_{95} value and would be a conservative approach.

> **UCL_{95}**
>
> For risk assessments, EPA recommends using the average concentration measured to represent "a reasonable estimate of the concentration likely to be contacted over time." However, because of the uncertainty associated with estimating the true average concentration at a given site, the 95 percent upper confidence limit (UCL_{95}) of the arithmetic mean should be used for this variable, which is also referred to as the exposure point concentration (EPC).

The marine species that were sampled (and listed in Table 16) included halibut, Dolly Varden, cod, octopus, sea urchin, mussel, bidarki (chiton), sea birds, seabird eggs, and seaweed. Radionuclide concentrations were available for both gull eggs and goose eggs; the greater of the maximum or UCL_{95} concentrations between these two types of eggs were selected as the EPC for seabird eggs in the calculations. Radionuclide concentrations were also available for two aquatic plants—dragon kelp and rockweed. Like the approach taken for seabird eggs, the greater of the maximum or UCL_{95} concentrations between these two types of aquatic plants were selected as the EPC for seaweed for risk calculations.

7.2.2.2 EPCs for Other Fish and Clams

EPCs used to calculate the potential risk for fish not sampled but reported in the diets are either the maximum or the UCL_{95} values selected from three fish species—greenling, Pacific cod, or rockfish. EPCs for clams are either the maximum or UCL_{95} of the sampling data for mussels.

7.2.2.3 EPCs for Sea Lion and Seal

To develop EPCs for sea lions and seals, radionuclide concentrations in seawater around Amchitka and Adak were estimated using the measured concentrations for a marine species and the bioaccumulation factors (BAFs) reported for that species. The BAFs are ratios of concentrations in the species to concentrations in seawater. To obtain seawater concentrations, the average measured concentrations for nine marine species were used. The nine species included four benthic fish—Irish lord, greenling, halibut, and rockfish; three mollusks—octopus, horse mussel, and chiton; and two macroalgae—rockweed and dragon kelp. The average radionuclide concentrations for each of the nine species were divided by the representative BAFs for that species to obtain estimates of radionuclide concentrations in water. Nine sets of water concentrations were estimated (one from each species), and for each radionuclide, the maximum of the estimated values was selected as the representative concentration in seawater. The

representative seawater concentrations were then multiplied by reported BAFs for marine mammals to obtain radionuclide concentrations in seals and sea lions.

The estimated seawater concentrations around Amchitka and Adak are compared with the concentrations for North Pacific Ocean reported in literature (Ku et al. 1977; Lee et al. 2003; Povinec et al. 2004, 2005; Hirose et al. 2006; Nakano and Povinec 2012; Kamenik et al. 2013). In general, the estimated concentrations for Amchitka and Adak are within the range of reported concentrations for North Pacific Ocean, except for the concentrations of ^{239}Pu and ^{240}Pu. For these two radionuclides, the estimated concentrations are a few times greater. However, because the ^{239}Pu and ^{240}Pu concentrations are 2 to 4 orders of magnitude lower than the concentrations of ^{137}Cs and uranium isotopes; the seawater concentrations of ^{239}Pu and ^{240}Pu have little effect on the total cancer risks associated with seafood ingestion. Seawater concentrations are presented in Table 35 and further discussions on the comparison of seawater concentrations are provided in Section 7.4.

Representative BAFs used for developing the EPCs of seals and sea lions were obtained primarily from the International Atomic Energy Agency (IAEA) wildlife transfer factors handbook (Howard et al. 2013), which is the most comprehensive database for BAFs available at present. The mean BAF values reported for each radionuclide and species were used. Besides the IAEA handbook (Howard et al. 2013), two others sources (ERICA 2013 and FASSET 2003) were also consulted to obtain BAFs; however, the values from these two sources were used only when BAFs were not available from the IAEA report (Howard et al. 2013). Table 22 lists the BAFs used for seals and sea lions (mammals) and other marine species.

Table 22. BAFs Used for Estimating Radionuclide Concentrations in Marine Species

Marine Species[a]	Am	Cs	Pu	U
Bottom fish	320	71	2500	14
Predator fish	58[b]	79	190	14[b]
Mollusk	9900	50	1100	32
Mollusk—bivalve	–[c]	63	650	35
Crustacean	500	53	120	10[b]
Bird	310[d]	480	540[d]	40[4]
Mammal	280[b]	220	1300	4[e]
Macroalgae	430	96	4100	83

[a] The primary source for BAFs is the wildlife transfer factors database compiled by IAEA (Howard et al. 2013) unless otherwise noted.
[b] Values are the defaults of ERICA (ERICA 2013).
[c] "–" denotes "not available."
[d] Values are from the FASSET database (FASSET 2003).
[e] Values is 10 times the default of ERICA (ERICA 2013).

7.2.2.4 EPCs for Salmon

Studies on the correlation between ^{137}Cs concentrations in Atlantic salmon and ^{137}Cs concentrations in seawater (Tucker et al. 1999 and Spares et al. 2007) showed that the concentrations in adult salmon reflected the entire range of values seen across the North Atlantic Ocean, which suggests that the marine life history of salmon is more panoceanic than previously thought, and they should be classified as a single trans-Atlantic straddling stock. Therefore, the

EPCs for salmon were estimated using literature radionuclide concentrations for North Pacific Ocean (Ku et al. 1977, Lee et al. 2003, Povinec et al. 2005, and Kamenik et al. 2013) and the BAFs for piscivorous fish primarily from the IAEA wildlife transfer factors handbook (Howard et al. 2013). The literature radionuclide concentrations for uranium, ^{241}Am, and $^{239/240}$Pu in the North Pacific Ocean were for year 2000 or earlier; they were used directly for estimating the EPCs without correction for effective half-life in the ocean. These earlier concentrations are expected to be higher than the present levels. The ^{137}Cs concentration in seawater was based on 2012 measurement data (Kamenik et al. 2013), which were obtained after the Fukushima Dai-ichi accident in 2011. The radionuclide concentrations in the North Pacific Ocean used for estimating the salmon EPCs are listed in Table 23.

7.2.2.5 EPCs for Crustaceans and Sea Birds

After representative radionuclide concentrations in seawater around Amchitka and Adak were determined, they were multiplied by BAFs for marine crustaceans to obtain radionuclide concentrations for shrimp and crab. For sea birds, the radionuclides concentrations were obtained by multiplying the representative seawater concentrations with the BAFs for sea birds. The BAFs used in these calculations are also listed in Table 22.

7.2.3 Risk Estimates

Potential risks from ingestion of seafood were estimated for an individual consuming seafood harvested from Amchitka using a range of diets including those reported for Atka, Nikolski, Unalaska, and St. Paul, and the composite diet based on the diet information from these four villages as discussed previously. Similar calculation was done using Adak data to compare the Amchitka results with the designated reference location for this sampling event. Therefore, the intake rates attributed to different marine species as listed in Table 16 were used with concentrations or EPCs in different species from the Amchitka and Adak 2011 sampling data (Table 18 through Table 21). Table 23 summarizes the estimated risk. Detailed risk estimates are provided in Table 24 through Table 33.

EPA's Acceptable Risk Range of 10^{-6} to 10^{-4}

10^{-6} indicates an increased probability of incurring cancer by age 70 of one chance in 1,000,000. The number 10^{-5} represents 1 chance in 100,000, and 10^{-4} represents 1 chance in 10,000.

An exposure to a substance associated with a risk of 10^{-6} would increase one's current chances of developing cancer from all causes (which are 1 in 3, or 0.33) by 0.000001.

Table 23. Summary of Risk Estimates for the Seafood Ingestion Pathway

Diet Data Used	Radionuclide Concentrations or EPCs				Difference Between Risk Estimates Based on Amchitka Versus Adak Data	
	Amchitka		Adak			
	Maximum	UCL_{95}	Maximum	UCL_{95}	Maximum	UCL_{95}
St. Paul Diet	7.4×10^{-7}	7.4×10^{-7}	5.9×10^{-7}	5.9×10^{-7}	1.5×10^{-7}	1.5×10^{-7}
Atka Diet	6.4×10^{-6}	6.1×10^{-6}	5.4×10^{-6}	5.2×10^{-6}	1.0×10^{-6}	9.0×10^{-7}
Nikolski Diet	2.3×10^{-5}	2.3×10^{-5}	2.3×10^{-5}	2.3×10^{-5}	–[a]	–[a]
Unalaska Diet	9.2×10^{-6}	9.2×10^{-6}	7.8×10^{-6}	7.8×10^{-6}	1.4×10^{-6}	1.4×10^{-6}
Composite	6.1×10^{-6}	6.0×10^{-6}	5.4×10^{-6}	5.3×10^{-6}	7.0×10^{-7}	7.0×10^{-7}

[a] There is no difference.
Note: Because the cancer risk estimates are very close, to show the differences, they are listed in two significant figures.

Based on Table 23, potential risks estimated with Amchitka and Adak sampling data are generally similar; however, risk estimates using Amchitka sampling data are slightly higher than those estimated using Adak sampling data. This result is consistent with the results of the statistical comparison of Amchitka and Adak data discussed in Section 6.3. The risk estimates for the five diets using data collected from Amchitka ranged from 7.4×10^{-7} to 2.3×10^{-5} using either maximums or UCL_{95} values as EPCs. For Adak, the range is from 5.9×10^{-7} to 2.3×10^{-5}, also using either maximums or UCL_{95} values as EPCs. The estimates using Amchitka data are slightly higher than those for Adak but not more than 1.4×10^{-6} (see Table 23 estimates for the Unalaska diet). The State of Alaska considers risk levels at or below 1×10^{-5} above background (or in this case above estimates for the reference location) to be an acceptable risk benchmark. The results also indicate that the estimated potential risk is a direct function of the intake amounts, and given the same seafood intake rates, the cancer risk estimates based on maximum concentrations and UCL_{95} concentrations for samples obtained in 2011 are almost the same.

Radionuclides that have significant contributions to the total risk can be identified by a comparison of the results shown in Table 24 through Table 33. Regardless of the choice of seafood intake data and radionuclide sampling locations, ^{137}Cs, ^{234}U, and ^{238}U are the three radionuclides that contributed the most to the risk estimates.

Some uncertainty is inherent with any method for estimating risk. The potential uncertainties associated with the risk analysis presented in this report are typical for such an evaluation. The use of seawater data and BAFs published in the literature to derive EPCs in tissue for species not sampled but included in the diet (e.g., salmon) may have overestimated the potential risk. Reported seawater concentrations in the North Pacific Ocean were used to estimate concentrations in salmon. For ^{241}Am, ^{239}Pu, ^{240}Pu, and uranium isotopes, the reported water concentrations corresponded to year 2000 or earlier. Because the reported values were used without correction for decay over time, the current concentrations are probably lower than the reported values. For ^{137}Cs, the water concentration used was the maximum value for the North Pacific Ocean measured after the Fukushima Dai-ichi incident (an average value was not reported). The average ^{137}Cs concentration across the North Pacific Ocean could be less than this value. The use of maximum water concentrations for the North Pacific Ocean could lead to higher salmon tissue concentrations being estimated and used for risk calculation. Further, there are uncertainties in the BAFs used to calculate water concentrations around Amchitka and Adak

Table 24. Potential Risks to an Aleut Consuming Seafood Harvested from Amchitka and Adak Using the St. Paul Diet Data and Maximum Measured Concentrations

Seafood species	^{241}Am		^{137}Cs+D		^{239}Pu		^{240}Pu		^{234}U		^{235}U+D		^{238}U+D		Total	
	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak
Halibut	2×10^{-11}	2×10^{-11}	3×10^{-9}	2×10^{-9}	1×10^{-10}	1×10^{-10}	3×10^{-11}	3×10^{-11}	1×10^{-8}	9×10^{-9}	2×10^{-10}	2×10^{-10}	4×10^{-9}	6×10^{-9}	2×10^{-8}	2×10^{-8}
Dolly Varden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cod	5×10^{-13}	2×10^{-13}	1×10^{-10}	1×10^{-10}	2×10^{-12}	2×10^{-12}	5×10^{-13}	5×10^{-13}	3×10^{-10}	2×10^{-10}	8×10^{-12}	5×10^{-12}	2×10^{-10}	1×10^{-10}	6×10^{-10}	4×10^{-10}
Salmon	7×10^{-11}	7×10^{-11}	2×10^{-8}	2×10^{-8}	9×10^{-11}	9×10^{-11}	6×10^{-11}	6×10^{-11}	9×10^{-8}	9×10^{-8}	4×10^{-9}	4×10^{-9}	1×10^{-7}	1×10^{-7}	2×10^{-7}	2×10^{-7}
Other fish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Octopus	5×10^{-12}	4×10^{-12}	2×10^{-10}	5×10^{-11}	1×10^{-11}	7×10^{-12}	1×10^{-11}	4×10^{-12}	4×10^{-9}	3×10^{-9}	2×10^{-10}	9×10^{-11}	5×10^{-9}	3×10^{-9}	9×10^{-9}	6×10^{-9}
Sea urchin	9×10^{-11}	6×10^{-11}	1×10^{-9}	1×10^{-9}	5×10^{-11}	4×10^{-11}	4×10^{-11}	2×10^{-11}	9×10^{-9}	1×10^{-8}	3×10^{-10}	3×10^{-10}	8×10^{-9}	8×10^{-9}	2×10^{-8}	2×10^{-8}
Mussel	1×10^{-11}	3×10^{-12}	2×10^{-10}	7×10^{-11}	5×10^{-11}	5×10^{-12}	2×10^{-11}	2×10^{-12}	1×10^{-9}	6×10^{-10}	4×10^{-11}	2×10^{-11}	1×10^{-9}	7×10^{-10}	2×10^{-9}	1×10^{-9}
Bidarki (chiton)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shrimp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crab	4×10^{-11}	4×10^{-11}	5×10^{-9}	4×10^{-9}	1×10^{-10}	6×10^{-11}	7×10^{-11}	3×10^{-11}	2×10^{-8}	1×10^{-8}	6×10^{-10}	4×10^{-10}	2×10^{-8}	1×10^{-8}	4×10^{-8}	3×10^{-8}
Clam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sea bird	8×10^{-12}	8×10^{-12}	1×10^{-8}	1×10^{-8}	2×10^{-10}	7×10^{-11}	9×10^{-11}	4×10^{-11}	2×10^{-8}	1×10^{-8}	7×10^{-10}	4×10^{-10}	2×10^{-8}	1×10^{-8}	5×10^{-8}	3×10^{-8}
Sea bird egg	1×10^{-11}	0	5×10^{-9}	0	1×10^{-10}	0	8×10^{-11}	0	8×10^{-10}	0	9×10^{-13}	0	2×10^{-11}	0	6×10^{-9}	0
Seaweed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seal	2×10^{-10}	2×10^{-10}	2×10^{-7}	2×10^{-7}	1×10^{-8}	6×10^{-9}	7×10^{-9}	3×10^{-9}	6×10^{-8}	4×10^{-8}	2×10^{-9}	1×10^{-9}	6×10^{-8}	4×10^{-8}	3×10^{-7}	2×10^{-7}
Sea lion	4×10^{-11}	4×10^{-11}	3×10^{-8}	3×10^{-8}	2×10^{-9}	1×10^{-9}	1×10^{-9}	5×10^{-10}	1×10^{-8}	6×10^{-9}	4×10^{-10}	2×10^{-10}	1×10^{-8}	7×10^{-9}	6×10^{-8}	4×10^{-8}
Total	**5×10^{-10}**	**5×10^{-10}**	**3×10^{-7}**	**2×10^{-7}**	**2×10^{-8}**	**7×10^{-9}**	**8×10^{-9}**	**4×10^{-9}**	**2×10^{-7}**	**2×10^{-7}**	**8×10^{-9}**	**7×10^{-9}**	**2×10^{-7}**	**2×10^{-7}**	**7×10^{-7}**	**6×10^{-7}**

Table 25. Potential Risks to an Aleut Consuming Seafood Harvested from Amchitka and Adak Using the St. Paul Diet Data and UCL_{95} Concentrations

Seafood species	^{241}Am		^{137}Cs+D		^{239}Pu		^{240}Pu		^{234}U		^{235}U+D		^{238}U+D		Total	
	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak
Halibut	2×10^{-11}	2×10^{-11}	3×10^{-9}	2×10^{-9}	1×10^{-10}	1×10^{-10}	3×10^{-11}	3×10^{-11}	1×10^{-8}	9×10^{-9}	2×10^{-10}	2×10^{-10}	4×10^{-9}	6×10^{-9}	2×10^{-8}	2×10^{-8}
Dolly Varden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cod	5×10^{-13}	2×10^{-13}	1×10^{-10}	1×10^{-10}	2×10^{-12}	2×10^{-12}	5×10^{-13}	5×10^{-13}	3×10^{-10}	2×10^{-10}	8×10^{-12}	5×10^{-12}	2×10^{-10}	1×10^{-10}	6×10^{-10}	4×10^{-10}
Salmon	7×10^{-11}	7×10^{-11}	2×10^{-8}	2×10^{-8}	9×10^{-11}	9×10^{-11}	6×10^{-11}	6×10^{-11}	9×10^{-8}	9×10^{-8}	4×10^{-9}	4×10^{-9}	1×10^{-7}	1×10^{-7}	2×10^{-7}	2×10^{-7}
Other fish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Octopus	5×10^{-12}	4×10^{-12}	2×10^{-10}	5×10^{-11}	1×10^{-11}	7×10^{-12}	1×10^{-11}	4×10^{-12}	4×10^{-9}	3×10^{-9}	2×10^{-10}	9×10^{-11}	5×10^{-9}	3×10^{-9}	9×10^{-9}	6×10^{-9}
Sea urchin	8×10^{-11}	6×10^{-11}	1×10^{-9}	1×10^{-9}	5×10^{-11}	4×10^{-11}	4×10^{-11}	2×10^{-11}	9×10^{-9}	1×10^{-8}	3×10^{-10}	3×10^{-10}	8×10^{-9}	8×10^{-9}	2×10^{-8}	2×10^{-8}
Mussel	9×10^{-12}	3×10^{-12}	1×10^{-10}	7×10^{-11}	3×10^{-11}	5×10^{-12}	1×10^{-11}	2×10^{-12}	1×10^{-9}	6×10^{-10}	4×10^{-11}	2×10^{-11}	1×10^{-9}	7×10^{-10}	2×10^{-9}	1×10^{-9}
Bidarki (chiton)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shrimp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crab	4×10^{-11}	4×10^{-11}	5×10^{-9}	4×10^{-9}	1×10^{-10}	6×10^{-11}	7×10^{-11}	3×10^{-11}	2×10^{-8}	1×10^{-8}	6×10^{-10}	4×10^{-10}	2×10^{-8}	1×10^{-8}	4×10^{-8}	3×10^{-8}
Clam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sea bird	8×10^{-12}	8×10^{-12}	1×10^{-8}	1×10^{-8}	2×10^{-10}	7×10^{-11}	9×10^{-11}	4×10^{-11}	2×10^{-8}	1×10^{-8}	7×10^{-10}	4×10^{-10}	2×10^{-8}	1×10^{-8}	5×10^{-8}	3×10^{-8}
Sea bird egg	1×10^{-11}	0	5×10^{-9}	0	1×10^{-10}	0	8×10^{-11}	0	8×10^{-10}	0	9×10^{-13}	0	2×10^{-11}	0	6×10^{-9}	0
Seaweed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seal	2×10^{-10}	2×10^{-10}	2×10^{-7}	2×10^{-7}	1×10^{-8}	6×10^{-9}	7×10^{-9}	3×10^{-9}	6×10^{-8}	4×10^{-8}	2×10^{-9}	1×10^{-9}	6×10^{-8}	4×10^{-8}	3×10^{-7}	2×10^{-7}
Sea lion	4×10^{-11}	4×10^{-11}	3×10^{-8}	3×10^{-8}	2×10^{-9}	1×10^{-9}	1×10^{-9}	5×10^{-10}	1×10^{-8}	6×10^{-9}	4×10^{-10}	2×10^{-10}	1×10^{-8}	7×10^{-9}	6×10^{-8}	4×10^{-8}
Total	**5×10^{-10}**	**5×10^{-10}**	**3×10^{-7}**	**2×10^{-7}**	**2×10^{-8}**	**7×10^{-9}**	**8×10^{-9}**	**4×10^{-9}**	**2×10^{-7}**	**2×10^{-7}**	**8×10^{-9}**	**7×10^{-9}**	**2×10^{-7}**	**2×10^{-7}**	**7×10^{-7}**	**6×10^{-7}**

Table 26. Potential Risks to an Aleut Consuming Seafood Harvested from Amchitka and Adak Using the Atka Diet Data and Maximum Measured Concentrations

Seafood species	^{241}Am		^{137}Cs+D		^{239}Pu		^{240}Pu		^{234}U		^{235}U+D		^{238}U+D		Total	
	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak
Halibut	6×10^{-11}	6×10^{-11}	1×10^{-8}	8×10^{-9}	4×10^{-10}	4×10^{-10}	1×10^{-10}	1×10^{-10}	4×10^{-8}	3×10^{-8}	6×10^{-8}	8×10^{-10}	2×10^{-8}	2×10^{-8}	7×10^{-8}	6×10^{-8}
Dolly Varden	3×10^{-12}	4×10^{-12}	4×10^{-8}	2×10^{-7}	2×10^{-11}	2×10^{-11}	2×10^{-11}	2×10^{-11}	1×10^{-9}	9×10^{-11}	1×10^{-11}	2×10^{-11}	3×10^{-10}	5×10^{-10}	4×10^{-8}	2×10^{-7}
Cod	6×10^{-11}	3×10^{-11}	2×10^{-8}	1×10^{-8}	2×10^{-10}	2×10^{-10}	6×10^{-11}	6×10^{-11}	3×10^{-8}	2×10^{-8}	1×10^{-9}	7×10^{-10}	3×10^{-8}	2×10^{-8}	8×10^{-8}	5×10^{-8}
Salmon	8×10^{-10}	8×10^{-10}	2×10^{-7}	2×10^{-7}	1×10^{-9}	1×10^{-9}	6×10^{-10}	6×10^{-10}	1×10^{-6}	1×10^{-6}	5×10^{-8}	5×10^{-8}	1×10^{-6}	1×10^{-6}	2×10^{-6}	2×10^{-6}
Other fish	2×10^{-9}	1×10^{-9}	6×10^{-8}	7×10^{-8}	3×10^{-9}	2×10^{-9}	1×10^{-9}	1×10^{-9}	4×10^{-7}	2×10^{-7}	1×10^{-8}	9×10^{-9}	3×10^{-7}	3×10^{-7}	8×10^{-7}	6×10^{-7}
Octopus	1×10^{-10}	8×10^{-11}	3×10^{-9}	1×10^{-9}	2×10^{-10}	1×10^{-10}	2×10^{-10}	7×10^{-11}	9×10^{-8}	5×10^{-8}	3×10^{-9}	2×10^{-9}	9×10^{-8}	5×10^{-8}	2×10^{-7}	1×10^{-7}
Sea urchin	5×10^{-10}	3×10^{-10}	7×10^{-9}	6×10^{-9}	3×10^{-10}	2×10^{-10}	2×10^{-10}	1×10^{-10}	5×10^{-8}	5×10^{-8}	1×10^{-9}	1×10^{-9}	4×10^{-8}	4×10^{-8}	1×10^{-7}	1×10^{-7}
Mussel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bidarki (chiton)	3×10^{-10}	2×10^{-10}	2×10^{-9}	9×10^{-10}	2×10^{-10}	2×10^{-10}	1×10^{-10}	8×10^{-11}	5×10^{-8}	5×10^{-8}	2×10^{-9}	2×10^{-9}	5×10^{-8}	5×10^{-8}	1×10^{-7}	1×10^{-7}
Shrimp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crab	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sea bird	1×10^{-10}	1×10^{-10}	2×10^{-7}	2×10^{-7}	3×10^{-9}	1×10^{-9}	2×10^{-9}	7×10^{-10}	3×10^{-7}	2×10^{-7}	1×10^{-8}	7×10^{-9}	3×10^{-7}	2×10^{-7}	9×10^{-7}	6×10^{-7}
Sea bird egg	7×10^{-12}	0	3×10^{-9}	0	8×10^{-11}	0	5×10^{-11}	0	5×10^{-10}	0	5×10^{-13}	0	1×10^{-11}	0	4×10^{-9}	0
Seaweed	5×10^{-12}	4×10^{-12}	2×10^{-10}	3×10^{-10}	3×10^{-11}	2×10^{-11}	2×10^{-11}	2×10^{-11}	2×10^{-8}	2×10^{-8}	5×10^{-10}	5×10^{-10}	2×10^{-8}	2×10^{-8}	3×10^{-8}	3×10^{-8}
Seal	4×10^{-10}	4×10^{-10}	3×10^{-7}	3×10^{-7}	2×10^{-8}	9×10^{-9}	1×10^{-8}	5×10^{-9}	1×10^{-7}	6×10^{-8}	3×10^{-9}	2×10^{-9}	1×10^{-7}	6×10^{-8}	5×10^{-7}	4×10^{-7}
Sea lion	8×10^{-10}	8×10^{-10}	7×10^{-7}	5×10^{-7}	5×10^{-8}	2×10^{-8}	2×10^{-8}	1×10^{-8}	2×10^{-7}	1×10^{-7}	7×10^{-9}	5×10^{-9}	2×10^{-7}	1×10^{-7}	1×10^{-6}	8×10^{-7}
Total	**5×10^{-9}**	**4×10^{-9}**	**2×10^{-6}**	**1×10^{-6}**	**8×10^{-8}**	**4×10^{-8}**	**4×10^{-8}**	**2×10^{-8}**	**2×10^{-6}**	**2×10^{-6}**	**9×10^{-8}**	**8×10^{-8}**	**2×10^{-6}**	**2×10^{-6}**	**6×10^{-6}**	**5×10^{-6}**

Table 27. Potential Risks to an Aleut Consuming Seafood Harvested from Amchitka and Adak Using the Atka Diet Data and UCL_{95} Concentrations

Seafood species	^{241}Am		^{137}Cs+D		^{239}Pu		^{240}Pu		^{234}U		^{235}U+D		^{238}U+D		Total	
	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak
Halibut	6×10^{-11}	6×10^{-11}	1×10^{-8}	8×10^{-9}	4×10^{-10}	4×10^{-10}	1×10^{-10}	1×10^{-10}	4×10^{-8}	3×10^{-8}	6×10^{-8}	8×10^{-10}	2×10^{-8}	2×10^{-8}	7×10^{-8}	6×10^{-8}
Dolly Varden	3×10^{-12}	4×10^{-12}	4×10^{-8}	2×10^{-7}	2×10^{-11}	2×10^{-11}	2×10^{-11}	2×10^{-11}	1×10^{-9}	9×10^{-11}	1×10^{-11}	2×10^{-11}	3×10^{-10}	5×10^{-10}	4×10^{-8}	2×10^{-7}
Cod	6×10^{-11}	3×10^{-11}	2×10^{-8}	1×10^{-8}	2×10^{-10}	2×10^{-10}	6×10^{-11}	6×10^{-11}	3×10^{-8}	2×10^{-8}	1×10^{-9}	7×10^{-10}	3×10^{-8}	2×10^{-8}	8×10^{-8}	5×10^{-8}
Salmon	8×10^{-10}	8×10^{-10}	2×10^{-7}	2×10^{-7}	1×10^{-9}	1×10^{-9}	6×10^{-10}	6×10^{-10}	1×10^{-6}	1×10^{-6}	5×10^{-8}	5×10^{-8}	1×10^{-6}	1×10^{-6}	2×10^{-6}	2×10^{-6}
Other fish	9×10^{-10}	7×10^{-10}	6×10^{-8}	4×10^{-8}	2×10^{-9}	2×10^{-9}	1×10^{-9}	1×10^{-9}	2×10^{-7}	2×10^{-7}	8×10^{-9}	5×10^{-9}	2×10^{-7}	2×10^{-7}	6×10^{-7}	4×10^{-7}
Octopus	1×10^{-10}	8×10^{-11}	3×10^{-9}	1×10^{-9}	2×10^{-10}	1×10^{-10}	2×10^{-10}	7×10^{-11}	9×10^{-8}	5×10^{-8}	3×10^{-9}	2×10^{-9}	9×10^{-8}	5×10^{-8}	2×10^{-7}	1×10^{-7}
Sea urchin	4×10^{-10}	3×10^{-10}	6×10^{-9}	6×10^{-9}	2×10^{-10}	2×10^{-10}	2×10^{-10}	1×10^{-10}	5×10^{-8}	5×10^{-8}	1×10^{-9}	1×10^{-9}	4×10^{-8}	4×10^{-8}	1×10^{-7}	1×10^{-7}
Mussel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bidarki (chiton)	3×10^{-10}	2×10^{-10}	2×10^{-9}	9×10^{-10}	2×10^{-10}	2×10^{-10}	1×10^{-10}	8×10^{-11}	5×10^{-8}	5×10^{-8}	2×10^{-9}	2×10^{-9}	5×10^{-8}	5×10^{-8}	1×10^{-7}	1×10^{-7}
Shrimp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crab	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sea bird	1×10^{-10}	1×10^{-10}	2×10^{-7}	2×10^{-7}	3×10^{-9}	1×10^{-9}	2×10^{-9}	7×10^{-10}	3×10^{-7}	2×10^{-7}	1×10^{-8}	7×10^{-9}	3×10^{-7}	2×10^{-7}	9×10^{-7}	6×10^{-7}
Sea bird egg	7×10^{-12}	0	3×10^{-9}	0	8×10^{-11}	0	5×10^{-11}	0	5×10^{-10}	0	5×10^{-13}	0	1×10^{-11}	0	4×10^{-9}	0
Seaweed	3×10^{-12}	2×10^{-12}	2×10^{-10}	2×10^{-10}	3×10^{-11}	1×10^{-11}	1×10^{-11}	1×10^{-11}	1×10^{-8}	1×10^{-8}	4×10^{-10}	4×10^{-10}	1×10^{-8}	1×10^{-8}	2×10^{-8}	2×10^{-8}
Seal	4×10^{-10}	4×10^{-10}	3×10^{-7}	3×10^{-7}	2×10^{-8}	9×10^{-9}	1×10^{-8}	5×10^{-9}	1×10^{-7}	6×10^{-8}	3×10^{-9}	2×10^{-9}	1×10^{-7}	6×10^{-8}	5×10^{-7}	4×10^{-7}
Sea lion	8×10^{-10}	8×10^{-10}	7×10^{-7}	5×10^{-7}	5×10^{-8}	2×10^{-8}	2×10^{-8}	1×10^{-8}	2×10^{-7}	1×10^{-7}	7×10^{-9}	5×10^{-9}	2×10^{-7}	1×10^{-7}	1×10^{-6}	8×10^{-7}
Total	$\mathbf{4 \times 10^{-9}}$	$\mathbf{3 \times 10^{-9}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{1 \times 10^{-6}}$	$\mathbf{8 \times 10^{-8}}$	$\mathbf{3 \times 10^{-8}}$	$\mathbf{4 \times 10^{-8}}$	$\mathbf{2 \times 10^{-8}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{9 \times 10^{-8}}$	$\mathbf{7 \times 10^{-8}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{6 \times 10^{-6}}$	$\mathbf{5 \times 10^{-6}}$

Table 28. Potential Risks to an Aleut Consuming Seafood Harvested from Amchitka and Adak Using the Nikolski Diet Data and Maximum Measured Concentrations

Seafood species	^{241}Am		^{137}Cs+D		^{239}Pu		^{240}Pu		^{234}U		^{235}U+D		^{238}U+D		Total	
	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak
Halibut	5×10^{-10}	5×10^{-10}	1×10^{-7}	7×10^{-8}	3×10^{-9}	3×10^{-9}	9×10^{-10}	9×10^{-10}	3×10^{-7}	3×10^{-7}	5×10^{-9}	6×10^{-9}	1×10^{-7}	2×10^{-7}	6×10^{-7}	5×10^{-7}
Dolly Varden	6×10^{-11}	8×10^{-11}	8×10^{-7}	4×10^{-6}	4×10^{-10}	4×10^{-10}	4×10^{-10}	4×10^{-10}	3×10^{-8}	2×10^{-8}	2×10^{-10}	3×10^{-10}	6×10^{-9}	9×10^{-9}	8×10^{-7}	4×10^{-6}
Cod	7×10^{-11}	3×10^{-11}	2×10^{-8}	1×10^{-8}	2×10^{-10}	2×10^{-10}	6×10^{-11}	6×10^{-11}	4×10^{-8}	2×10^{-8}	1×10^{-9}	7×10^{-10}	3×10^{-8}	2×10^{-8}	9×10^{-8}	6×10^{-8}
Salmon	5×10^{-9}	5×10^{-9}	1×10^{-6}	1×10^{-6}	6×10^{-9}	6×10^{-9}	4×10^{-9}	4×10^{-9}	6×10^{-6}	6×10^{-6}	3×10^{-7}	3×10^{-7}	7×10^{-6}	7×10^{-6}	1×10^{-5}	1×10^{-5}
Other fish	1×10^{-10}	8×10^{-11}	4×10^{-9}	5×10^{-9}	2×10^{-10}	2×10^{-10}	1×10^{-10}	1×10^{-10}	3×10^{-8}	2×10^{-8}	9×10^{-10}	7×10^{-10}	3×10^{-8}	2×10^{-8}	6×10^{-8}	5×10^{-8}
Octopus	5×10^{-11}	4×10^{-11}	2×10^{-9}	5×10^{-10}	1×10^{-10}	7×10^{-11}	1×10^{-10}	4×10^{-11}	4×10^{-8}	3×10^{-8}	2×10^{-9}	9×10^{-10}	4×10^{-8}	3×10^{-8}	9×10^{-8}	5×10^{-8}
Sea urchin	3×10^{-10}	2×10^{-10}	4×10^{-9}	4×10^{-9}	2×10^{-10}	1×10^{-10}	1×10^{-10}	7×10^{-11}	3×10^{-8}	3×10^{-8}	8×10^{-10}	8×10^{-10}	2×10^{-8}	2×10^{-8}	5×10^{-8}	6×10^{-8}
Mussel	6×10^{-9}	1×10^{-9}	1×10^{-7}	3×10^{-8}	2×10^{-8}	2×10^{-9}	1×10^{-8}	1×10^{-9}	5×10^{-7}	3×10^{-7}	2×10^{-8}	1×10^{-8}	5×10^{-7}	3×10^{-7}	1×10^{-6}	6×10^{-7}
Bidarki (chiton)	1×10^{-9}	6×10^{-10}	9×10^{-9}	3×10^{-9}	7×10^{-10}	6×10^{-10}	4×10^{-10}	3×10^{-10}	2×10^{-7}	2×10^{-7}	7×10^{-9}	6×10^{-9}	2×10^{-7}	2×10^{-7}	4×10^{-7}	4×10^{-7}
Shrimp	5×10^{-12}	5×10^{-12}	6×10^{-10}	5×10^{-10}	2×10^{-11}	7×10^{-12}	8×10^{-12}	4×10^{-12}	2×10^{-9}	1×10^{-9}	7×10^{-11}	4×10^{-11}	2×10^{-9}	1×10^{-9}	5×10^{-9}	3×10^{-9}
Crab	2×10^{-11}	2×10^{-11}	3×10^{-9}	2×10^{-9}	7×10^{-11}	3×10^{-11}	4×10^{-11}	2×10^{-11}	9×10^{-9}	5×10^{-9}	3×10^{-10}	2×10^{-10}	9×10^{-9}	6×10^{-9}	2×10^{-8}	1×10^{-8}
Clam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sea bird	8×10^{-10}	8×10^{-10}	1×10^{-6}	1×10^{-6}	2×10^{-8}	8×10^{-9}	1×10^{-8}	4×10^{-9}	2×10^{-6}	1×10^{-6}	7×10^{-8}	4×10^{-8}	2×10^{-6}	1×10^{-6}	5×10^{-6}	4×10^{-6}
Sea bird egg	3×10^{-11}	0	1×10^{-8}	0	4×10^{-10}	0	2×10^{-10}	0	2×10^{-9}	0	3×10^{-12}	0	6×10^{-11}	0	2×10^{-8}	0
Seaweed	0	0	0	0	0	0	0	0	0	0	0E+00	0	0	0	0	0
Seal	2×10^{-10}	2×10^{-10}	2×10^{-7}	2×10^{-7}	1×10^{-8}	6×10^{-9}	7×10^{-9}	3×10^{-9}	6×10^{-8}	4×10^{-8}	2×10^{-9}	1×10^{-9}	7×10^{-8}	4×10^{-8}	4×10^{-7}	3×10^{-7}
Sea lion	1×10^{-10}	1×10^{-10}	1×10^{-7}	1×10^{-7}	9×10^{-9}	4×10^{-9}	4×10^{-9}	2×10^{-9}	4×10^{-8}	2×10^{-8}	1×10^{-9}	8×10^{-10}	4×10^{-8}	2×10^{-8}	2×10^{-7}	2×10^{-7}
Total	**1×10^{-8}**	**9×10^{-9}**	**4×10^{-6}**	**6×10^{-6}**	**7×10^{-8}**	**3×10^{-8}**	**4×10^{-8}**	**2×10^{-8}**	**9×10^{-6}**	**8×10^{-6}**	**4×10^{-7}**	**3×10^{-7}**	**1×10^{-5}**	**9×10^{-6}**	**2×10^{-5}**	**2×10^{-5}**

Table 29. Potential Risks to an Aleut Consuming Seafood Harvested from Amchitka and Adak Using the Nikolski Diet Data and UCL_{95} Concentrations

Seafood species	^{241}Am		^{137}Cs+D		^{239}Pu		^{240}Pu		^{234}U		^{235}U+D		^{238}U+D		Total	
	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak
Halibut	5×10^{-10}	5×10^{-10}	1×10^{-7}	7×10^{-8}	3×10^{-9}	3×10^{-9}	9×10^{-10}	9×10^{-10}	3×10^{-7}	3×10^{-7}	5×10^{-9}	6×10^{-9}	1×10^{-7}	2×10^{-7}	6×10^{-7}	5×10^{-7}
Dolly Varden	6×10^{-11}	8×10^{-11}	8×10^{-7}	4×10^{-6}	4×10^{-10}	4×10^{-10}	4×10^{-10}	4×10^{-10}	3×10^{-8}	2×10^{-8}	2×10^{-10}	3×10^{-10}	6×10^{-9}	9×10^{-9}	8×10^{-7}	4×10^{-6}
Cod	7×10^{-11}	3×10^{-11}	2×10^{-8}	1×10^{-8}	2×10^{-10}	2×10^{-10}	6×10^{-11}	6×10^{-11}	4×10^{-8}	2×10^{-8}	1×10^{-9}	7×10^{-10}	3×10^{-8}	2×10^{-8}	9×10^{-8}	6×10^{-8}
Salmon	5×10^{-9}	5×10^{-9}	1×10^{-6}	1×10^{-6}	6×10^{-9}	6×10^{-9}	4×10^{-9}	4×10^{-9}	6×10^{-6}	6×10^{-6}	3×10^{-7}	3×10^{-7}	7×10^{-6}	7×10^{-6}	1×10^{-5}	1×10^{-5}
Other fish	7×10^{-11}	5×10^{-11}	4×10^{-9}	3×10^{-9}	2×10^{-10}	2×10^{-10}	1×10^{-10}	9×10^{-11}	2×10^{-8}	1×10^{-8}	6×10^{-10}	4×10^{-10}	2×10^{-8}	1×10^{-8}	4×10^{-8}	3×10^{-8}
Octopus	5×10^{-11}	4×10^{-11}	2×10^{-9}	5×10^{-10}	1×10^{-10}	7×10^{-11}	1×10^{-10}	4×10^{-11}	4×10^{-8}	3×10^{-8}	2×10^{-9}	9×10^{-10}	4×10^{-8}	3×10^{-8}	9×10^{-8}	5×10^{-8}
Sea urchin	2×10^{-10}	2×10^{-10}	3×10^{-9}	3×10^{-9}	1×10^{-10}	1×10^{-10}	1×10^{-10}	7×10^{-11}	3×10^{-8}	3×10^{-8}	8×10^{-10}	8×10^{-10}	2×10^{-8}	2×10^{-8}	5×10^{-8}	6×10^{-8}
Mussel	4×10^{-9}	1×10^{-9}	6×10^{-8}	3×10^{-8}	1×10^{-8}	2×10^{-9}	6×10^{-9}	1×10^{-9}	4×10^{-7}	3×10^{-7}	2×10^{-8}	1×10^{-8}	5×10^{-7}	3×10^{-7}	1×10^{-6}	6×10^{-7}
Bidarki (chiton)	1×10^{-9}	6×10^{-10}	9×10^{-9}	3×10^{-9}	7×10^{-10}	6×10^{-10}	4×10^{-10}	3×10^{-10}	2×10^{-7}	2×10^{-7}	7×10^{-9}	6×10^{-9}	2×10^{-7}	2×10^{-7}	4×10^{-7}	4×10^{-7}
Shrimp	5×10^{-12}	5×10^{-12}	6×10^{-10}	5×10^{-10}	2×10^{-11}	7×10^{-12}	8×10^{-12}	4×10^{-12}	2×10^{-9}	1×10^{-9}	7×10^{-11}	4×10^{-11}	2×10^{-9}	1×10^{-9}	5×10^{-9}	3×10^{-9}
Crab	2×10^{-11}	2×10^{-11}	3×10^{-9}	2×10^{-9}	7×10^{-11}	3×10^{-11}	4×10^{-11}	2×10^{-11}	9×10^{-9}	5×10^{-9}	3×10^{-10}	2×10^{-10}	9×10^{-9}	6×10^{-9}	2×10^{-8}	1×10^{-8}
Clam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sea bird	8×10^{-10}	8×10^{-10}	1×10^{-6}	1×10^{-6}	2×10^{-8}	8×10^{-9}	1×10^{-8}	4×10^{-9}	2×10^{-6}	1×10^{-6}	7×10^{-8}	4×10^{-8}	2×10^{-6}	1×10^{-6}	5×10^{-6}	4×10^{-6}
Sea bird egg	3×10^{-11}	0	1×10^{-8}	0	4×10^{-10}	0	2×10^{-10}	0	2×10^{-9}	0	3×10^{-12}	0	6×10^{-11}	0	2×10^{-8}	0
Seaweed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seal	2×10^{-10}	2×10^{-10}	2×10^{-7}	2×10^{-7}	1×10^{-8}	6×10^{-9}	7×10^{-9}	3×10^{-9}	6×10^{-8}	4×10^{-8}	2×10^{-9}	1×10^{-9}	7×10^{-8}	4×10^{-8}	4×10^{-7}	3×10^{-7}
Sea lion	1×10^{-10}	1×10^{-10}	1×10^{-7}	1×10^{-7}	9×10^{-9}	4×10^{-9}	4×10^{-9}	2×10^{-9}	4×10^{-8}	2×10^{-8}	1×10^{-9}	8×10^{-10}	4×10^{-8}	2×10^{-8}	2×10^{-7}	2×10^{-7}
Total	**1×10^{-8}**	**9×10^{-9}**	**4×10^{-6}**	**6×10^{-6}**	**7×10^{-8}**	**3×10^{-8}**	**3×10^{-8}**	**2×10^{-8}**	**9×10^{-6}**	**8×10^{-6}**	**4×10^{-7}**	**3×10^{-7}**	**1×10^{-5}**	**9×10^{-6}**	**2×10^{-5}**	**2×10^{-5}**

Table 30. Potential Risks to an Aleut Consuming Seafood Harvested from Amchitka and Adak Using Unalaska Diet Data and Maximum Measured Concentrations

Seafood species	^{241}Am		^{137}Cs+D		^{239}Pu		^{240}Pu		^{234}U		^{235}U+D		^{238}U+D		Total	
	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak
Halibut	9×10^{-11}	1×10^{-10}	2×10^{-8}	1×10^{-8}	6×10^{-10}	6×10^{-10}	2×10^{-10}	2×10^{-10}	6×10^{-8}	5×10^{-8}	9×10^{-10}	1×10^{-9}	3×10^{-8}	3×10^{-8}	1×10^{-7}	1×10^{-7}
Dolly Varden	3×10^{-12}	5×10^{-12}	5×10^{-8}	2×10^{-7}	2×10^{-11}	2×10^{-11}	2×10^{-11}	2×10^{-11}	2×10^{-9}	1×10^{-9}	1×10^{-11}	2×10^{-11}	4×10^{-10}	6×10^{-10}	5×10^{-8}	2×10^{-7}
Cod	3×10^{-11}	1×10^{-11}	7×10^{-9}	6×10^{-9}	9×10^{-11}	9×10^{-11}	3×10^{-11}	3×10^{-11}	1×10^{-8}	9×10^{-9}	4×10^{-10}	3×10^{-10}	1×10^{-8}	8×10^{-9}	3×10^{-8}	2×10^{-8}
Salmon	1×10^{-9}	1×10^{-9}	3×10^{-7}	3×10^{-7}	2×10^{-9}	2×10^{-9}	1×10^{-9}	1×10^{-9}	2×10^{-6}	2×10^{-6}	8×10^{-8}	8×10^{-8}	2×10^{-6}	2×10^{-6}	4×10^{-6}	4×10^{-6}
Other fish	2×10^{-10}	1×10^{-10}	6×10^{-9}	8×10^{-9}	3×10^{-10}	3×10^{-10}	1×10^{-10}	2×10^{-10}	4×10^{-8}	3×10^{-8}	1×10^{-9}	1×10^{-9}	4×10^{-8}	3×10^{-8}	9×10^{-8}	7×10^{-8}
Octopus	3×10^{-11}	2×10^{-11}	1×10^{-9}	3×10^{-10}	7×10^{-11}	4×10^{-11}	6×10^{-11}	2×10^{-11}	3×10^{-8}	2×10^{-8}	9×10^{-10}	5×10^{-10}	3×10^{-8}	2×10^{-8}	5×10^{-8}	3×10^{-8}
Sea urchin	3×10^{-10}	2×10^{-10}	4×10^{-9}	4×10^{-9}	2×10^{-10}	1×10^{-10}	1×10^{-10}	8×10^{-11}	3×10^{-8}	3×10^{-8}	1×10^{-9}	1×10^{-9}	3×10^{-8}	3×10^{-8}	6×10^{-8}	7×10^{-8}
Mussel	1×10^{-10}	2×10^{-11}	2×10^{-9}	6×10^{-10}	3×10^{-10}	3×10^{-11}	2×10^{-10}	2×10^{-11}	8×10^{-9}	5×10^{-9}	3×10^{-10}	2×10^{-10}	8×10^{-9}	5×10^{-9}	2×10^{-8}	1×10^{-8}
Bidarki (chiton)	4×10^{-11}	2×10^{-11}	4×10^{-10}	1×10^{-10}	3×10^{-11}	2×10^{-11}	2×10^{-11}	1×10^{-11}	7×10^{-9}	7×10^{-9}	3×10^{-10}	2×10^{-10}	7×10^{-9}	6×10^{-9}	2×10^{-8}	1×10^{-8}
Shrimp	5×10^{-11}	5×10^{-11}	6×10^{-9}	5×10^{-9}	2×10^{-10}	7×10^{-11}	9×10^{-11}	4×10^{-11}	2×10^{-8}	1×10^{-8}	7×10^{-10}	4×10^{-10}	2×10^{-8}	1×10^{-8}	5×10^{-8}	3×10^{-8}
Crab	3×10^{-10}	3×10^{-10}	3×10^{-8}	3×10^{-8}	9×10^{-10}	4×10^{-10}	5×10^{-10}	2×10^{-10}	1×10^{-7}	7×10^{-8}	4×10^{-9}	2×10^{-9}	1×10^{-7}	7×10^{-8}	3×10^{-7}	2×10^{-7}
Clam	2×10^{-9}	3×10^{-10}	3×10^{-8}	9×10^{-9}	5×10^{-9}	5×10^{-10}	3×10^{-9}	3×10^{-10}	1×10^{-7}	7×10^{-8}	4×10^{-9}	3×10^{-9}	1×10^{-7}	8×10^{-8}	3×10^{-7}	2×10^{-7}
Sea bird	6×10^{-10}	6×10^{-10}	9×10^{-7}	8×10^{-7}	1×10^{-8}	5×10^{-9}	6×10^{-9}	3×10^{-9}	1×10^{-6}	8×10^{-7}	5×10^{-8}	3×10^{-8}	1×10^{-6}	9×10^{-7}	4×10^{-6}	2×10^{-6}
Sea bird egg	4×10^{-12}	0	1×10^{-9}	0	4×10^{-11}	0	2×10^{-11}	0	3×10^{-10}	0	3×10^{-13}	0	6×10^{-12}	0	2×10^{-9}	0
Seaweed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seal	1×10^{-10}	1×10^{-10}	1×10^{-7}	9×10^{-8}	8×10^{-9}	3×10^{-9}	4×10^{-9}	2×10^{-9}	3×10^{-8}	2×10^{-8}	1×10^{-9}	7×10^{-10}	3×10^{-8}	2×10^{-8}	2×10^{-7}	1×10^{-7}
Sea lion	7×10^{-11}	7×10^{-11}	6×10^{-8}	5×10^{-8}	4×10^{-9}	2×10^{-9}	2×10^{-9}	9×10^{-10}	2×10^{-8}	1×10^{-8}	6×10^{-10}	4×10^{-10}	2×10^{-8}	1×10^{-8}	1×10^{-7}	7×10^{-8}
Total	$\mathbf{5 \times 10^{-9}}$	$\mathbf{3 \times 10^{-9}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{3 \times 10^{-8}}$	$\mathbf{1 \times 10^{-8}}$	$\mathbf{2 \times 10^{-8}}$	$\mathbf{8 \times 10^{-9}}$	$\mathbf{4 \times 10^{-6}}$	$\mathbf{3 \times 10^{-6}}$	$\mathbf{1 \times 10^{-7}}$	$\mathbf{1 \times 10^{-7}}$	$\mathbf{4 \times 10^{-6}}$	$\mathbf{3 \times 10^{-6}}$	$\mathbf{9 \times 10^{-6}}$	$\mathbf{8 \times 10^{-6}}$

Table 31. Potential Risks to an Aleut Consuming Seafood Harvested from Amchitka and Adak Using the Unalaska Diet Data and UCL_{95} Concentrations

Seafood species	^{241}Am		^{137}Cs+D		^{239}Pu		^{240}Pu		^{234}U		^{235}U+D		^{238}U+D		Total	
	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak
Halibut	9×10^{-11}	1×10^{-10}	2×10^{-8}	1×10^{-8}	6×10^{-10}	6×10^{-10}	2×10^{-10}	2×10^{-10}	6×10^{-8}	5×10^{-8}	9×10^{-10}	1×10^{-9}	3×10^{-8}	3×10^{-8}	1×10^{-7}	1×10^{-7}
Dolly Varden	3×10^{-12}	5×10^{-12}	5×10^{-8}	2×10^{-7}	2×10^{-11}	2×10^{-11}	2×10^{-11}	2×10^{-11}	2×10^{-9}	1×10^{-9}	1×10^{-11}	2×10^{-11}	4×10^{-10}	6×10^{-10}	5×10^{-8}	2×10^{-7}
Cod	3×10^{-11}	1×10^{-11}	7×10^{-9}	6×10^{-9}	9×10^{-11}	9×10^{-11}	3×10^{-11}	3×10^{-11}	1×10^{-8}	9×10^{-9}	4×10^{-10}	3×10^{-10}	1×10^{-8}	8×10^{-9}	3×10^{-8}	2×10^{-8}
Salmon	1×10^{-9}	1×10^{-9}	3×10^{-7}	3×10^{-7}	2×10^{-9}	2×10^{-9}	1×10^{-9}	1×10^{-9}	2×10^{-6}	2×10^{-6}	8×10^{-8}	8×10^{-8}	2×10^{-6}	2×10^{-6}	4×10^{-6}	4×10^{-6}
Other fish	1×10^{-10}	8×10^{-11}	6×10^{-9}	4×10^{-9}	3×10^{-10}	2×10^{-10}	1×10^{-10}	1×10^{-10}	3×10^{-8}	2×10^{-8}	9×10^{-10}	6×10^{-10}	3×10^{-8}	2×10^{-8}	6×10^{-8}	4×10^{-8}
Octopus	3×10^{-11}	2×10^{-11}	1×10^{-9}	3×10^{-10}	7×10^{-11}	4×10^{-11}	6×10^{-11}	2×10^{-11}	3×10^{-8}	2×10^{-8}	9×10^{-10}	5×10^{-10}	3×10^{-8}	2×10^{-8}	5×10^{-8}	3×10^{-8}
Sea urchin	3×10^{-10}	2×10^{-10}	4×10^{-9}	4×10^{-9}	2×10^{-10}	1×10^{-10}	1×10^{-10}	8×10^{-11}	3×10^{-8}	3×10^{-8}	1×10^{-9}	1×10^{-9}	3×10^{-8}	3×10^{-8}	6×10^{-8}	7×10^{-8}
Mussel	7×10^{-11}	2×10^{-11}	1×10^{-9}	6×10^{-10}	2×10^{-10}	3×10^{-11}	1×10^{-10}	2×10^{-11}	7×10^{-9}	5×10^{-9}	3×10^{-10}	2×10^{-10}	8×10^{-9}	5×10^{-9}	2×10^{-8}	1×10^{-8}
Bidarki (chiton)	4×10^{-11}	2×10^{-11}	4×10^{-10}	1×10^{-10}	3×10^{-11}	2×10^{-11}	2×10^{-11}	1×10^{-11}	7×10^{-9}	7×10^{-9}	3×10^{-10}	2×10^{-10}	7×10^{-9}	6×10^{-9}	2×10^{-8}	1×10^{-8}
Shrimp	5×10^{-11}	5×10^{-11}	6×10^{-9}	5×10^{-9}	2×10^{-10}	7×10^{-11}	9×10^{-11}	4×10^{-11}	2×10^{-8}	1×10^{-8}	7×10^{-10}	4×10^{-10}	2×10^{-8}	1×10^{-8}	5×10^{-8}	3×10^{-8}
Crab	3×10^{-10}	3×10^{-10}	3×10^{-8}	3×10^{-8}	9×10^{-10}	4×10^{-10}	5×10^{-10}	2×10^{-10}	1×10^{-7}	7×10^{-8}	4×10^{-9}	2×10^{-9}	1×10^{-7}	7×10^{-8}	3×10^{-7}	2×10^{-7}
Clam	1×10^{-9}	3×10^{-10}	2×10^{-8}	9×10^{-9}	3×10^{-9}	5×10^{-10}	2×10^{-9}	3×10^{-10}	1×10^{-7}	7×10^{-8}	4×10^{-9}	3×10^{-9}	1×10^{-7}	8×10^{-8}	3×10^{-7}	2×10^{-7}
Sea bird	6×10^{-10}	6×10^{-10}	9×10^{-7}	8×10^{-7}	1×10^{-8}	5×10^{-9}	6×10^{-9}	3×10^{-9}	1×10^{-6}	8×10^{-7}	5×10^{-8}	3×10^{-8}	1×10^{-6}	9×10^{-7}	4×10^{-6}	2×10^{-6}
Sea bird egg	4×10^{-12}	0	1×10^{-9}	0	4×10^{-11}	0	2×10^{-11}	0	3×10^{-10}	0	3×10^{-13}	0	6×10^{-12}	0	2×10^{-9}	0
Seaweed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seal	1×10^{-10}	1×10^{-10}	1×10^{-7}	9×10^{-8}	8×10^{-9}	3×10^{-9}	4×10^{-9}	2×10^{-9}	3×10^{-8}	2×10^{-8}	1×10^{-9}	7×10^{-10}	3×10^{-8}	2×10^{-8}	2×10^{-7}	1×10^{-7}
Sea lion	7×10^{-11}	7×10^{-11}	6×10^{-8}	5×10^{-8}	4×10^{-9}	2×10^{-9}	2×10^{-9}	9×10^{-10}	2×10^{-8}	1×10^{-8}	6×10^{-10}	4×10^{-10}	2×10^{-8}	1×10^{-8}	1×10^{-7}	7×10^{-8}
Total	$\mathbf{4 \times 10^{-9}}$	$\mathbf{3 \times 10^{-9}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{3 \times 10^{-8}}$	$\mathbf{1 \times 10^{-8}}$	$\mathbf{2 \times 10^{-8}}$	$\mathbf{8 \times 10^{-9}}$	$\mathbf{4 \times 10^{-6}}$	$\mathbf{3 \times 10^{-6}}$	$\mathbf{1 \times 10^{-7}}$	$\mathbf{1 \times 10^{-7}}$	$\mathbf{4 \times 10^{-6}}$	$\mathbf{3 \times 10^{-6}}$	$\mathbf{9 \times 10^{-6}}$	$\mathbf{8 \times 10^{-6}}$

Table 32. Potential Risks to an Aleut Consuming Seafood Harvested from Amchitka and Adak Using the Composite Diet Data and Maximum Measured Concentrations

Seafood species	^{241}Am		^{137}Cs+D		^{239}Pu		^{240}Pu		^{234}U		^{235}U+D		^{238}U+D		Total	
	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak
Halibut	8×10^{-11}	9×10^{-11}	2×10^{-8}	1×10^{-8}	5×10^{-10}	5×10^{-10}	2×10^{-10}	2×10^{-10}	5×10^{-8}	5×10^{-8}	8×10^{-10}	1×10^{-9}	2×10^{-8}	3×10^{-8}	9×10^{-8}	9×10^{-8}
Dolly Varden	6×10^{-12}	9×10^{-12}	8×10^{-8}	4×10^{-7}	4×10^{-11}	4×10^{-11}	4×10^{-11}	4×10^{-11}	3×10^{-9}	2×10^{-9}	2×10^{-11}	3×10^{-11}	6×10^{-10}	9×10^{-10}	8×10^{-8}	4×10^{-7}
Cod	2×10^{-11}	1×10^{-11}	6×10^{-9}	5×10^{-9}	7×10^{-11}	7×10^{-11}	2×10^{-11}	2×10^{-11}	1×10^{-8}	8×10^{-9}	4×10^{-10}	2×10^{-10}	1×10^{-8}	7×10^{-9}	3×10^{-8}	2×10^{-8}
Salmon	1×10^{-9}	1×10^{-9}	2×10^{-7}	2×10^{-7}	1×10^{-9}	1×10^{-9}	8×10^{-10}	8×10^{-10}	1×10^{-6}	1×10^{-6}	6×10^{-8}	6×10^{-8}	1×10^{-6}	1×10^{-6}	3×10^{-6}	3×10^{-6}
Other fish	3×10^{-10}	2×10^{-10}	1×10^{-8}	1×10^{-8}	5×10^{-10}	4×10^{-10}	2×10^{-10}	2×10^{-10}	7×10^{-8}	5×10^{-8}	2×10^{-9}	2×10^{-9}	6×10^{-8}	5×10^{-8}	1×10^{-7}	1×10^{-7}
Octopus	3×10^{-11}	3×10^{-11}	1×10^{-9}	3×10^{-10}	7×10^{-11}	4×10^{-11}	7×10^{-11}	2×10^{-11}	3×10^{-8}	2×10^{-8}	9×10^{-10}	5×10^{-10}	3×10^{-8}	2×10^{-8}	6×10^{-8}	3×10^{-8}
Sea urchin	2×10^{-10}	1×10^{-10}	3×10^{-9}	3×10^{-9}	1×10^{-10}	1×10^{-10}	1×10^{-10}	6×10^{-11}	2×10^{-8}	2×10^{-8}	7×10^{-10}	7×10^{-10}	2×10^{-8}	2×10^{-8}	5×10^{-8}	5×10^{-8}
Mussel	5×10^{-10}	9×10^{-11}	8×10^{-9}	3×10^{-9}	2×10^{-9}	2×10^{-10}	8×10^{-10}	8×10^{-11}	4×10^{-8}	2×10^{-8}	1×10^{-9}	8×10^{-10}	4×10^{-8}	2×10^{-8}	9×10^{-8}	5×10^{-8}
Bidarki (chiton)	1×10^{-10}	8×10^{-11}	1×10^{-9}	4×10^{-10}	9×10^{-11}	8×10^{-11}	5×10^{-11}	4×10^{-11}	2×10^{-8}	2×10^{-8}	8×10^{-10}	7×10^{-10}	2×10^{-8}	2×10^{-8}	5×10^{-8}	4×10^{-8}
Shrimp	2×10^{-11}	2×10^{-11}	2×10^{-9}	2×10^{-9}	6×10^{-11}	2×10^{-11}	3×10^{-11}	1×10^{-11}	7×10^{-9}	4×10^{-9}	2×10^{-10}	2×10^{-10}	7×10^{-9}	5×10^{-9}	2×10^{-8}	1×10^{-8}
Crab	1×10^{-10}	1×10^{-10}	1×10^{-8}	1×10^{-8}	4×10^{-10}	2×10^{-10}	2×10^{-10}	9×10^{-11}	5×10^{-8}	3×10^{-8}	2×10^{-9}	1×10^{-9}	5×10^{-8}	3×10^{-8}	1×10^{-7}	7×10^{-8}
Clam	6×10^{-10}	1×10^{-10}	9×10^{-9}	3×10^{-9}	2×10^{-9}	2×10^{-10}	9×10^{-10}	9×10^{-11}	4×10^{-8}	3×10^{-8}	1×10^{-9}	9×10^{-10}	4×10^{-8}	3×10^{-8}	1×10^{-7}	6×10^{-8}
Sea bird	3×10^{-10}	3×10^{-10}	5×10^{-7}	4×10^{-7}	6×10^{-9}	3×10^{-9}	3×10^{-9}	1×10^{-9}	7×10^{-7}	4×10^{-7}	2×10^{-8}	1×10^{-8}	7×10^{-7}	4×10^{-7}	2×10^{-6}	1×10^{-6}
Sea bird egg	1×10^{-11}	0	4×10^{-9}	0	1×10^{-10}	0	6×10^{-11}	0	7×10^{-10}	0	7×10^{-13}	0	2×10^{-11}	0	5×10^{-9}	0
Seaweed	7×10^{-13}	6×10^{-13}	3×10^{-11}	4×10^{-11}	4×10^{-12}	3×10^{-12}	3×10^{-12}	2×10^{-12}	2×10^{-9}	2×10^{-9}	8×10^{-11}	8×10^{-11}	2×10^{-9}	2×10^{-9}	4×10^{-9}	4×10^{-9}
Seal	2×10^{-10}	2×10^{-10}	2×10^{-7}	1×10^{-7}	1×10^{-8}	5×10^{-9}	6×10^{-9}	3×10^{-9}	6×10^{-8}	3×10^{-8}	2×10^{-9}	1×10^{-9}	6×10^{-8}	4×10^{-8}	3×10^{-7}	2×10^{-7}
Sea lion	2×10^{-10}	2×10^{-10}	1×10^{-7}	1×10^{-7}	1×10^{-8}	4×10^{-9}	5×10^{-9}	2×10^{-9}	4×10^{-8}	3×10^{-8}	2×10^{-8}	9×10^{-10}	4×10^{-8}	3×10^{-8}	2×10^{-7}	2×10^{-7}
Total	$\mathbf{4 \times 10^{-9}}$	$\mathbf{3 \times 10^{-9}}$	$\mathbf{1 \times 10^{-6}}$	$\mathbf{1 \times 10^{-6}}$	$\mathbf{4 \times 10^{-8}}$	$\mathbf{2 \times 10^{-8}}$	$\mathbf{2 \times 10^{-8}}$	$\mathbf{8 \times 10^{-9}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{9 \times 10^{-8}}$	$\mathbf{8 \times 10^{-8}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{2 \times 10^{-6}}$	$\mathbf{6 \times 10^{-6}}$	$\mathbf{5 \times 10^{-6}}$

Table 33. Potential Risks to an Aleut Consuming Seafood Harvested from Amchitka and Adak Using the Composite Diet Data and UCL_{95} Concentrations

Seafood species	^{241}Am		^{137}Cs+D		^{239}Pu		^{240}Pu		^{234}U		^{235}U+D		^{238}U+D		Total	
	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak	Amchitka	Adak
Halibut	8×10^{-11}	9×10^{-11}	2×10^{-8}	1×10^{-8}	5×10^{-10}	5×10^{-10}	2×10^{-10}	2×10^{-10}	5×10^{-8}	5×10^{-8}	8×10^{-10}	1×10^{-9}	2×10^{-8}	3×10^{-8}	9×10^{-8}	9×10^{-8}
Dolly Varden	6×10^{-12}	9×10^{-12}	8×10^{-8}	4×10^{-7}	4×10^{-11}	4×10^{-11}	4×10^{-11}	4×10^{-11}	3×10^{-9}	2×10^{-9}	2×10^{-11}	3×10^{-11}	6×10^{-10}	9×10^{-10}	8×10^{-8}	4×10^{-7}
Cod	2×10^{-11}	1×10^{-11}	6×10^{-9}	5×10^{-9}	7×10^{-11}	7×10^{-11}	2×10^{-11}	2×10^{-11}	1×10^{-8}	8×10^{-9}	4×10^{-10}	2×10^{-10}	1×10^{-8}	7×10^{-9}	3×10^{-8}	2×10^{-8}
Salmon	1×10^{-9}	1×10^{-9}	2×10^{-7}	2×10^{-7}	1×10^{-9}	1×10^{-9}	8×10^{-10}	8×10^{-10}	1×10^{-6}	1×10^{-6}	6×10^{-8}	6×10^{-8}	1×10^{-6}	1×10^{-6}	3×10^{-6}	3×10^{-6}
Other fish	2×10^{-10}	1×10^{-10}	1×10^{-8}	7×10^{-9}	5×10^{-10}	4×10^{-10}	2×10^{-10}	2×10^{-10}	5×10^{-8}	3×10^{-8}	2×10^{-9}	9×10^{-10}	4×10^{-8}	3×10^{-8}	1×10^{-7}	7×10^{-8}
Octopus	3×10^{-11}	3×10^{-11}	1×10^{-9}	3×10^{-10}	7×10^{-11}	4×10^{-11}	7×10^{-11}	2×10^{-11}	3×10^{-8}	2×10^{-8}	9×10^{-10}	5×10^{-10}	3×10^{-8}	2×10^{-8}	6×10^{-8}	3×10^{-8}
Sea urchin	2×10^{-10}	1×10^{-10}	3×10^{-9}	3×10^{-9}	1×10^{-10}	1×10^{-10}	1×10^{-10}	6×10^{-11}	2×10^{-8}	2×10^{-8}	7×10^{-10}	7×10^{-10}	2×10^{-8}	2×10^{-8}	5×10^{-8}	5×10^{-8}
Mussel	3×10^{-10}	9×10^{-11}	5×10^{-9}	3×10^{-9}	1×10^{-9}	2×10^{-10}	5×10^{-10}	8×10^{-11}	3×10^{-8}	2×10^{-8}	1×10^{-9}	8×10^{-10}	4×10^{-8}	2×10^{-8}	8×10^{-8}	5×10^{-8}
Bidarki (chiton)	1×10^{-10}	8×10^{-11}	1×10^{-9}	4×10^{-10}	9×10^{-11}	8×10^{-11}	5×10^{-11}	4×10^{-11}	2×10^{-8}	2×10^{-8}	8×10^{-10}	7×10^{-10}	2×10^{-8}	2×10^{-8}	5×10^{-8}	4×10^{-8}
Shrimp	2×10^{-11}	2×10^{-11}	2×10^{-9}	2×10^{-9}	6×10^{-11}	2×10^{-11}	3×10^{-11}	1×10^{-11}	7×10^{-9}	4×10^{-9}	2×10^{-10}	2×10^{-10}	7×10^{-9}	5×10^{-9}	2×10^{-8}	1×10^{-8}
Crab	1×10^{-10}	1×10^{-10}	1×10^{-8}	1×10^{-8}	4×10^{-10}	2×10^{-10}	2×10^{-10}	9×10^{-11}	5×10^{-8}	3×10^{-8}	2×10^{-9}	1×10^{-9}	5×10^{-8}	3×10^{-8}	1×10^{-7}	7×10^{-8}
Clam	4×10^{-10}	1×10^{-10}	6×10^{-9}	3×10^{-9}	1×10^{-9}	2×10^{-10}	6×10^{-10}	9×10^{-11}	4×10^{-8}	3×10^{-8}	1×10^{-9}	9×10^{-10}	4×10^{-8}	3×10^{-8}	9×10^{-8}	6×10^{-8}
Sea bird	3×10^{-10}	3×10^{-10}	5×10^{-7}	4×10^{-7}	6×10^{-9}	3×10^{-9}	3×10^{-9}	1×10^{-9}	7×10^{-7}	4×10^{-7}	2×10^{-8}	1×10^{-8}	7×10^{-7}	4×10^{-7}	2×10^{-6}	1×10^{-6}
Sea bird egg	1×10^{-11}	0	4×10^{-9}	0	1×10^{-10}	0	6×10^{-11}	0	7×10^{-10}	0	7×10^{-13}	0	2×10^{-11}	0	5×10^{-9}	0
Seaweed	4×10^{-13}	3×10^{-13}	2×10^{-11}	3×10^{-11}	2×10^{-12}	2×10^{-12}	2×10^{-12}	2×10^{-12}	2×10^{-9}	1×10^{-9}	6×10^{-11}	5×10^{-11}	2×10^{-9}	2×10^{-9}	3×10^{-9}	3×10^{-9}
Seal	2×10^{-10}	2×10^{-10}	2×10^{-7}	1×10^{-7}	1×10^{-8}	5×10^{-9}	6×10^{-9}	3×10^{-9}	6×10^{-8}	3×10^{-8}	2×10^{-9}	1×10^{-9}	6×10^{-8}	4×10^{-8}	3×10^{-7}	2×10^{-7}
Sea lion	2×10^{-10}	2×10^{-10}	1×10^{-7}	1×10^{-7}	1×10^{-8}	4×10^{-9}	5×10^{-9}	2×10^{-9}	4×10^{-8}	3×10^{-8}	2×10^{-8}	9×10^{-10}	4×10^{-8}	3×10^{-8}	2×10^{-7}	2×10^{-7}
Total	**3×10^{-9}**	**2×10^{-9}**	**1×10^{-6}**	**1×10^{-6}**	**3×10^{-8}**	**2×10^{-8}**	**2×10^{-8}**	**8×10^{-9}**	**2×10^{-6}**	**2×10^{-6}**	**9×10^{-8}**	**8×10^{-8}**	**2×10^{-6}**	**2×10^{-6}**	**6×10^{-6}**	**5×10^{-6}**

and to calculate the EPCs for several other species (e.g., sea lion and seal). The level of conservatism cannot be determined, but the values used were obtained from the latest and most comprehensive database compiled by IAEA (Howard et al. 2013) and should be appropriate for use in this assessment.

7.3 Summary of Potential Seafood Ingestion Risk Analysis

As discussed previously, the results of the risk calculations summarized in Table 23 and detailed in Table 24 through Table 33 for the five diets discussed in Section 7.1 indicate that overall potential risks from the ingestion of seafood based on the samples collected from Amchitka and Adak in 2011 are similar and are at 2×10^{-5} or lower (i.e., within EPA's acceptable risk range of 1×10^{-6} to 1×10^{-4}). The primary contributors to the risk estimates are the ^{137}Cs and ^{234,235,238}U concentrations.

Decision Rule for Seafood Safety DQO

(1) If the concentrations in Adak samples for a given species and analyte are equal to or greater than the concentrations in Amchitka samples and are all lower than 10^{-5} risk equivalent, data would be documented and used for comparison (as baseline) against future (2016) data.

(2) If the Amchitka concentrations are higher than the Adak and global fallout concentrations but lower than the diet-based 10^{-5} excess risk of cancer concentrations, the Alaska stakeholder group will be notified to discuss the need for follow-up activities.

(3) If radionuclide concentrations are higher than the diet-based 10^{-5} excess risk of cancer levels, the Alaska stakeholder group will be notified to discuss the need for follow-up activities; this discussion would take into account 2004 data. Follow-up action could include a reanalysis of archived samples from LM's 2011 sampling event.

The risk estimates using Amchitka data are slightly higher than those using Adak data by 1.4×10^{-6}. This is lower than the 1×10^{-5} risk level (in excess of background) used by the State of Alaska as the benchmark for acceptable risk. For the 2011 sampling event, Adak served as the background location. Hence, based on the 2011 data collected for Amchitka and Adak, seafood harvested at Amchitka and Adak is considered safe for consumption at the intake levels for the five diets evaluated. In addition, the potential increase in cesium concentrations observed in the samples due to the Fukushima Dai-ichi event has not resulted in unacceptable risk estimates. These results are consistent with Decision Rule #1 established for DQO#1. Data from the 2011 sampling event will be documented for future comparisons.

7.4 Ecological Health Evaluation (Using the RESRAD-BIOTA Code)

The second DQO outlined in the 2011 Sampling Plan (DOE 2011) was to evaluate the ecological health of the biota species collected as part of the sampling. For this evaluation, the derived seawater concentrations as discussed in Section 7.2 are used for determining the ecological health of the species sampled by comparing the derived seawater concentrations with screening values incorporated into the RESRAD-BIOTA code (ISCORS 2004). If the derived seawater concentrations are greater than the screening values, then an analysis using the code to evaluate absorbed radiation dose to each species sampled would be conducted. The results of the code for each species is compared with the DOE guideline of 1 rad per day set to protect aquatic organisms (DOE 2002a).

The decision rule for this particular DQO discussed in the 2011 Sampling Plan stated that if radionuclide concentrations (in seawater around Amchitka and Adak) indicated that the ecological health index is below the guideline, no further data analysis will be performed. If the seawater concentrations indicated that the ecological health index could be greater than the guideline, additional ecological health analyses may be warranted.

RESRAD-BIOTA was developed by Argonne National Laboratory to implement DOE's guidance on evaluation of radiation doses to aquatic and terrestrial biota. According to DOE's guidance (DOE 2002a), a graded approach should be used for the evaluation. In Tier 1 analysis, representative environmental medium concentrations are compared with predetermined concentration limits called biota concentration guides (BCGs) to determine whether potential exists that radiation doses to biota species could exceed the target dose level. If the potential exists, then a Tier 2 or Tier 3 analysis, with the use of site- and species-specific information, can be conducted to obtain dose estimates to biota species for comparison with the target dose level. In this ecological health evaluation, the biota species of concern are aquatic organisms; therefore, the representative seawater concentrations around Amchitka and Adak Islands are compared with predetermined water BCGs in Tier 1 (i.e., screening) analysis. The water BCGs are the limiting water concentrations of individual radionuclides that were determined by DOE (DOE 2002a) through rigorous radiation dose analyses concerning a variety of aquatic organisms. If water concentration of a radionuclide is less than its BCG, potential radiation dose caused by that radionuclide to any aquatic organism living in the water is most likely to be less than the target dose level of 1 rad/day.

In this evaluation, a Tier 1 analysis was conducted. Representative radionuclide concentrations in seawater near Amchitka and Adak islands, obtained using sampling data for nine marine species (see Section 7.2.2), were used as input to the RESRAD-BIOTA code for comparison with BCGs for water. Table 34 lists the representative water concentrations determined for Amchitka and Adak islands, respectively, and their ratios to the BCGs. Because a BCG for ^{240}Pu was not established, it was assumed to be the same as the BCG for ^{239}Pu. Based on the listed values, the sum of ratios of radionuclide concentration to BCG for all radionuclides is much lower than the threshold value of 1; therefore, it is concluded that potential radiation doses to marine species of concern would be far below the target dose level (1 rad/day), and no further analysis is required.

The representative seawater concentrations near Amchitka and Adak islands were compared with reported seawater concentrations for North Pacific Ocean obtained from literature, which were unit-converted and are also listed in Table 34. The comparison shows that representative seawater concentrations of ^{241}Am and uranium isotopes determined for Amchitka and Adak islands are within the range of reported concentrations for the North Pacific Ocean. For ^{137}Cs, ^{239}Pu, and ^{240}Pu, the concentrations near Amchitka and Adak islands are somewhat higher than the reported concentrations for the North Pacific Ocean. (If the comparison included modeled concentrations for the North Pacific Ocean, the ^{137}Cs concentrations near Amchitka and Adak islands would be within the range of concentrations for the North Pacific Ocean. This could be due to the conservatism associated with the selection of representative concentrations near Amchitka and Adak islands. The representative concentrations were determined by choosing the highest water concentrations back-calculated with sampling data of nine different species (see Section 7.2.2 for discussions).

Table 34. Tier 1 Analysis of Potential Ecological Risks to Marine Biota

Concentration/ Ratio	Radionuclide							
	^{241}Am	^{137}Cs	^{239}Pu	^{240}Pu	^{234}U	^{235}U	^{238}U	Sum of Ratios to BCG
BCG (pCi/L)	438	42.6	187	187	202	217	223	
Water conc. (pCi/L)—Amchitka	0.000059	0.23	0.00059	0.00030	1.6	0.053	1.3	
Ratio to BCG—Amchitka	<0.0001	0.0054	<0.0001	<0.0001	0.0077	0.0002	0.0056	0.0189
Water conc. (pCi/L)—Adak	0.000059	0.19	0.00025	0.00013	0.94	0.033	0.79	
Ratio to BCG—Adak	<0.0001	0.0044	<0.0001	<0.0001	0.0047	0.0002	0.0035	0.0128
Water conc. (pCi/L)—North Pacific Ocean[a]	0.000018 to 0.00032	0.043 to 0.11	0.000042 to 0.00015	0.000035 to 0.00012	1.24	0.057	1.09	
Description of water conc.—North Pacific Ocean	Low–high	Low–high	Average–Max.	Average–Max.	Calculated based on total uranium	Calculated based on total uranium	Calculated based on total uranium	
Ratio to BCG—North Pacific Ocean	<0.0001	0.0010–0.0025	<0.0001	<0.0001	0.0062	0.0003	0.0049	0.0123–0.0138

BCG = Biota Concentration Guide
pCi/L = picocuries per liter
[a] Sources of literature data: for ^{241}Am, Lee et al. 2003; for ^{137}Cs, Kamenik et al. 2013; for ^{239}Pu and ^{240}Pu, Provinec et al. 2005 (for average) and Hirose et al. 2006 (for max.); for ^{234}U, ^{235}U, and ^{238}U, Ku et al. 1977. Literature data for $^{239+240}$Pu were converted to data for individual radionuclides (^{239}Pu and ^{240}Pu) with an atom ratio of 0.225 between ^{240}Pu and ^{239}Pu; the ratio is the average of the range 0.17-0.28 (Hirose et al. 2006). Literature data for total uranium were converted to data for individual radionuclides (^{234}U, ^{235}U, and ^{238}U) with an activity ratio of 1.14: 0.052:1, where 1.14 and 1 were from Ku et al. 1977, and 0.052 was estimated by multiplying the ratio of 1.14 between ^{234}U and ^{238}U, with the ratio of 0.046 between ^{235}U and ^{234}U in natural uranium.

The seawater concentrations of ^{239}Pu and ^{240}Pu are two to four orders of magnitude lower than the concentrations of ^{137}Cs and uranium isotopes; therefore, they contribute little influence to the overall impact caused by radionuclides to the marine ecosystem. The sum of ratios of the North Pacific seawater concentrations to the BCGs (0.0123) is also well below the threshold value of 1, which indicates that the potential radiation doses to marine species in North Pacific Ocean are well below the target dose limit of 1 rad/day set by DOE (2002a) to protect aquatic organisms.

Except for the concentrations of ^{137}Cs, the reported concentrations for other radionuclides in North Pacific Ocean corresponded to year 2000 or earlier. Due to radioactive decay, present concentrations of these radionuclides are expected to be lower than the listed values. The reported ^{137}Cs concentrations in Pacific Ocean corresponded to year 2012 after the Fukushima Dai-ichi incident and were measured in the Pacific Ocean north of the Hawaiian Islands (low value) and between Japan and Hawaii (high value) (Kamenik et al. 2013). According to the results of a mathematical modeling performed by Nakano and Povince (2012), the maximum ^{137}Cs concentration predicted for the Northwest Pacific Ocean after the Fukushima Dai-ichi incident was 21 becquerels per cubic meter in 2012, which converts to 0.567 picocuries per liter (pCi/L). The representative ^{137}Cs concentrations selected for Amchitka and Adak islands are about 30–40 percent of this modeled maximum, which provides indication of the level of conservatism associated with the seawater concentrations selected for Amchitka and Adak for this evaluation.

8.0 Tritium Concentrations

The third DQO outlined in the 2011 Sampling Plan (DOE 2011) was to collect seawater samples off the coastline of the Cannikin site on the Bering Sea side of Amchitka, and from seawater samples collected from other Amchitka and Adak locations. Baseline tritium concentrations in seawater are being established starting with the tritium data collected in 2011 for seawater near Amchitka and Adak. The results from numerous historical sampling events have not adequately addressed whether measured values of tritium in seawater near Amchitka are from global fallout or whether they are related to the Amchitka nuclear tests. Tritium is one of the first radionuclides that would be seen in any leakage occurring from the underground test in the first 200 years.

Tritium (half-life = 12.43 years) is the radioactive isotope of hydrogen that decays by beta to the noble gas helium-3. Tritium is produced naturally by interaction of cosmic rays with nitrogen and oxygen mainly in the upper atmosphere, and after oxidation to tritiated water, takes part in the hydrologic cycle. Shortly after the discovery of natural tritium in the environment, the potential of tritium as a tracer of water movement in natural water systems, including the ocean, was recognized (Lamont-Doherty Earth Observatory 2013).

Starting in the early 1950s, tritium from anthropogenic sources (mainly nuclear weapons tests) was added to the atmosphere in considerable amounts. By the mid-1960s, the natural background of tritium in precipitation was masked completely by so-called bomb tritium. The bomb tritium severely limited the use of natural tritium as a tracer because very few uncontaminated tritium data from the pre-bomb era are available. However, the anthropogenic tritium offered a new tool for studies of water movement in natural systems, that is, a dye introduced into the environment on a global scale at a relatively well-known rate. During the last 2 decades bomb tritium has developed into a routine parameter in studies of natural water systems.

Natural tritium concentrations in surface waters are of the order of 10^{-18} tritium atoms per hydrogen atom. For this reason, tritium concentrations are reported as Tritium Units (TU), which derive from a tritium-to-hydrogen ratio ([T]/[H]) of 10^{-18} (1 TU is equivalent to an activity of 3.2 pCi/L in water). The production rate of natural tritium is about 0.5 ± 0.3 atoms tritium per square centimeter, leading to natural tritium values in mean continental precipitation of about 5 TU (16 pCi/L).

A major part of the bomb tritium was injected into the stratosphere, from where it mixed down into the troposphere and participates in the hydrologic cycle. Transfer to the surface waters of the oceans, which are the largest sink for tritium, occurs by water vapor exchange, precipitation, and continental runoff. Because most of the nuclear weapons tests were performed in the Northern Hemisphere, the tritium distribution is strongly asymmetric with relatively high concentrations in the Northern Hemisphere compared to those in the Southern Hemisphere.

Present day tritium concentrations (natural tritium and anthropogenic tritium) are of the order of 10 TU (32 pCi/L) in continental precipitation. In the ocean, the maximum tritium concentrations observed in the Northern Hemisphere surface water are of the order of 2 TU (6.4 pCi/L). Water bodies in regions with high runoff components, such as the Arctic Ocean, or a location surrounded by continents, such as the Mediterranean Sea, have elevated tritium concentrations. Present day tritium concentrations in Southern Ocean surface waters are of the order of 0.15 TU (0.48 pCi/L).

During a 2-year survey of the Aleutian Islands performed as part of ADEC's Alaska Monitoring and Assessment Program, seawater was sampled at random stations along the entire chain and analyzed for tritium (ADEC 2012). This sampling program covered the eastern part of the Aleutian Islands in 2006 and the western Aleutian Islands in 2007, during which a subset of seawater samples was collected off the coast of the Cannikin site.

Table 35 contains information on the mean, standard deviation, median, and range of each data set. The comparison, taking into account the MDC of measurement, shows that the activity of tritium in the marine environment surrounding Amchitka and Adak is similar to global fallout concentrations (i.e., previous sampling results). Data will be collected in subsequent sampling events to analyze trends.

Table 35. Comparison Statistics for Tritium

Tritium Sampling Effort	*n*	Mean	±	SD	Median	Range	Range of MDCs
Eastern Aleutians 2006[a]	62	4.3	±	2.5	4.2	−1.9 – 9.9	6.6 – 11
Western Aleutians 2007[a]	59	2.8	±	2.0	2.5	−0.7 – 9.1	3.8 – 7.1
Cannikin 2007[a]	39	3.1	±	1.3	2.8	1.1 – 6.1	2.6 – 5.3
Cannikin 2011	69	1.6	±	0.2	1.6	1.2 – 2.2	0.30
Long Shot 2011	9	1.7	±	0.2	1.7	1.5 – 2.0	0.30
Milrow 2011	9	1.9	±	0.2	1.9	1.6 – 2.2	0.30
Adak North 2011	9	1.7	±	0.2	1.7	1.5 – 2.2	0.30
Adak South 2011	9	1.9	±	0.5	1.8	1.4 – 2.8	0.30
Adak 2011	18	1.8	±	0.4	1.8	1.4 – 2.8	0.30

[a] 2006–2007 Alaska Monitoring and Assessment Program Data (ADEC 2012)
All units in pCi/L
n = number of samples; SD = standard deviation; MDC = minimum detectable concentration

For all results reported here, no laboratory or data validation qualifiers were reported.
Duplicate samples were excluded from this summary.

9.0 Cesium-137 Concentrations in Lichen, Soil Beneath Lichen, and Marine Sediment

The fourth DQO outlined in the 2011 Sampling Plan (DOE 2011) was to collect star reindeer lichen, soil beneath the lichen, and marine sediment and analyze those samples for ^{137}Cs. Radioactive materials remain in the subsurface test cavities of the three nuclear test sites on Amchitka Island. Reindeer lichen, soil beneath the lichen, and marine sediment at Amchitka and the reference Adak site could provide information on whether the reindeer lichen or marine sediment have retained radionuclides and could provide additional data to support the interpretation of environmental monitoring results being collected for the Amchitka site.

The analytical data are used to establish baseline radionuclide (^{134}Cs and ^{137}Cs) concentrations in star reindeer lichen, the soil beneath the lichen, and marine sediment. The data from the 2011 sampling event are also compared with available data from literature sources or previous sampling events as available. Indications of uptake by star reindeer lichen, the soil beneath the lichen, and marine sediment will be considered in the planning for upcoming data collection.

On March 11, 2011, more than 3 months before LM's biological sampling event on Amchitka and Adak Islands, a 9.0 magnitude earthquake and subsequent massive tsunami struck the island of Japan, severely damaging several reactors at the Fukushima Dai-ichi Nuclear Power Plant and releasing radioactive materials into the environment. To determine what this direct release of radioactive materials into the atmosphere might have contributed to the background radiation on Amchitka and Adak Islands, semiquantitative gamma spectrometry measurements were made during the data validation process. The results imply that Dolly Varden, rockweed, and to a lesser extent, Irish lord appear to contain a significant cesium isotope signature from Fukushima Dai-ichi. The estimated ^{134}Cs/^{137}Cs activity ratios in pooled fauna samples at the time sampled ranged from <30 to about 60 percent. Observations of Fukushima-derived fallout impacting on this region are supported by findings of elevated levels of ^{134}Cs (and ^{137}Cs) in lichen and soil collected from both the Adak and Amchitka regions. The activity concentrations of ^{137}Cs reported in Table 36 therefore represent maximal expected values measured without consideration of beta activity interference derived from ^{134}Cs (Hamilton et al. 2012b).

Table 36 through Table 39 summarize the sampling data for lichen, soil, and sediment collected at Amchitka and Adak in 2011. The concentrations vary significantly among different samples, especially ^{137}Cs concentrations in soil, for which the maximum values are 5−20 times higher than the minimum values. Sampling data of both lichen and soil show that ^{134}Cs and ^{137}Cs levels in Adak are higher than the levels in Amchitka.

More sediment samples were collected than reported here. Sediment samples were to be split with UAF, instead the entire sample was shipped to UAF and no split sample was sent to LLNL. The 2011 sediment samples currently in UAF's possession will be split at a later date and processed as part of the 2016 sampling event.

A large discrepancy was apparent in a comparison of the ratios calculated (based on average concentrations) from lichen and soil data shown in Tables 37 and 38. The ratio is about 27 with soil data but is about 1.2 with lichen data. For comparison, the ratio is about 2.2 with sediment data. The high ratio may be attributable to fallout due to the Fukushima Dai-ichi event.

Table 36. ^{134}Cs and ^{137}Cs in Lichen, Soil Beneath the Lichen, and Marine Sediment, Amchitka and Adak Islands

Sample ID	Location Code	Sample Types	Dry/ wet (%)	Ash/ dry (%)	^{137}Cs	Flag	^{134}Cs	Flag	$^{134}Cs/^{137}Cs$ Activity Ratio
Soil (pCi/kg dry wt)									
JET-741	SEDI-LS-LT1-1	Marine Sediment[a]	81.9	99.0	36.3 ± 5.6	–	14	U	–
JET-743	SEDI-ML-MT1-1	Marine Sediment	64.4	95.9	11.9 ± 3.6	–	7	U	–
JDQ-904	SOIL-AD-XXX-1	Terrestrial Soil	38.7	73.3	7264 ± 114	–	180	U	–
JDQ-905	SOIL-AD-XXX-2	Terrestrial Soil	47.6	22.6	1135 ± 26	–	56 ± 12	–	0.05 ± 0.01
JDQ-906	SOIL-AD-XXX-3	Terrestrial Soil	15.0	28.1	6591 ± 133	–	319 ± 60	–	0.05 ± 0.01
JDQ-901	SOIL-AI-ML-1	Terrestrial Soil	68.1	79.1	312 ± 22	–	48	U	–
JDQ-902	SOIL-AI-LT1-2	Terrestrial Soil	12.5	73.5	6110 ± 121	–	221	U	–
JDQ-903	SOIL-AI-CT1-3	Terrestrial Soil	33.8	69.0	2174 ± 30	–	50	U	–
Lichen (pCi/kg wet wt)									
JDQ-895	STRL-AI-ML-1	Lichen	27.9	1.6	550 ± 7	–	460 ± 4.2	–	0.84 ± 0.01
JDQ-896	STRL-AI-LT1-2	Lichen	33.0	1.5	404 ± 7	–	287 ± 3.8	–	0.71 ± 0.02
JDQ-897	STRL-AD-XXX-1	Lichen	51.1	2.8	6236 ± 42	–	5352 ± 25	–	0.86 ± 0.01
JDQ-898	STRL-AI-CT1-1	Lichen	63.1	12.1	1523 ± 14	–	1282 ± 8.4	–	0.84 ± 0.01
JDQ-899	STRL-AD-XXX-2	Lichen	40.5	4.5	3238 ± 119	–	2666 ± 11	–	0.82 ± 0.01
JDQ-900	STRL-AD-XXX-3	Lichen	62.9	4.1	2855 ± 20	–	2269 ± 12	–	0.79 ± 0.01
JDQ-900-DUP	STRL-AD-XXX-3	Lichen	63.7	4.1	2951 ± 26	–	2426 ± 16	–	0.82 ± 0.01
JDQ-900-DUP	STRL-AD-XXX-3	Lichen	63.7	4.1	2951 ± 26	–	2426 ± 16	–	0.82 ± 0.01

[a] Marine sediment collected by the land-based team from the intertidal zone adjacent the Long Shot and Milrow areas.

Table 37. ^{134}Cs and ^{137}Cs Data for Lichen Collected at Amchitka and Adak in 2011

Data Attribute	Amchitka		Adak	
	^{134}Cs	^{137}Cs	^{134}Cs	^{137}Cs
Number of samples	3	3	3	3
Minimum concentration	287 (wet wt.) 1,340 (dry wt.)	404 (wet wt.) 1,890 (dry wt.)	2,269 (wet wt.) 10,600 (dry wt.)	2,855 (wet wt.) 13,300 (dry wt.)
Maximum concentration	1,282 (wet wt.) 5,990 (dry wt.)	1,523 (wet wt.) 7,120 (dry wt.)	5,352 (wet wt.) 25,000 (dry wt.)	6,236 (wet wt.) 29,100 (dry wt.)
Mean concentration	676 (wet wt.) 3,160 (dry wt.)	826 (wet wt.) 3,860 (dry wt.)	3,429 (wet wt.) 16,000 (dry wt.)	4,110 (wet wt.) 19,200 (dry wt.)
Median concentration	460 (wet wt.) 2,150 (dry wt.)	550 (wet wt.) 2,570 (dry wt.)	2,666 (wet wt.) 12,500 (dry wt.)	3,238 (wet wt.) 15,100 (dry wt.)
Standard deviation	434 (wet wt.) 2,030 (dry wt.)	497 (wet wt.) 2,320 (dry wt.)	1,369 (wet wt.) 6,400 (dry wt.)	1,512 (wet wt.) 7,070 (dry wt.)

Units are pCi/kg.
Note: The 2011 sampling data are wet-weight based, which were converted to dry-weight-based concentrations using a dry-to-wet weight ratio of 0.214 for lichen (Hamilton et al. 2012a).

Table 38. ^{134}Cs and ^{137}Cs Data for Soil Collected at Amchitka and Adak in 2011

Data Attribute	Amchitka		Adak	
	^{134}Cs	^{137}Cs	^{134}Cs	^{137}Cs
Number of samples	3	3	3	3
Minimum concentration	48	312	56	1135
Maximum concentration	221	6110	319	7264
Mean concentration	106	2865	185	4997
Median concentration	50	2174	180	6591
Standard deviation	81	2417	107	2744

Units are pCi/kg.

Table 39. ^{134}Cs and ^{137}Cs Data for Sediment Collected at Amchitka and Adak in 2011

Data Attribute	Amchitka		Adak	
	^{134}Cs	^{137}Cs	^{134}Cs	^{137}Cs
Number of samples[a]	2	2	–	–
Minimum concentration	7	12	–	–
Maximum concentration	14	36	–	–
Mean concentration	11	24	–	–

Units are pCi/kg.
Note: "–" data not available.
[a] Marine sediment collected by the land-based team from the intertidal zone adjacent the Long Shot and Milrow areas.

Comparison of 2011 Lichen Data with Data from Literature Sources

^{137}Cs concentrations in lichen have been used as indicators for studying the influence of global fallout in the Arctic region. Ranges of ^{137}Cs concentration reported in past sampling activities at Amchitka and Adak are summarized in Table 40. The reported concentrations are based on dry-weight material.

Table 40. ^{137}Cs in Lichen at Amchitka and Adak Island 1970–1997

Location	Number of Samples	Range of Data
^{137}Cs in Lichen Collected at Amchitka Island in 1970–71[a]		
Clam Lake	7	8000 ± 90–27,000 ± 500
^{137}Cs in Lichen Collected at Amchitka Island in 1971–79[b]		
Clam Lake	15	1500 ± 3000–67,000 ± 500
Icebox Lake	10	3000 ± 80–16,000 ± 300
Cannikin Lake	10	2500 ± 120–21,000 ± 200
^{137}Cs in Lichen Collected at Amchitka and Adak in 1997[c]		
Amchitka Island	4	62 ± 10–74 ± 12
Adak Island	3	24 ± 20–24 ± 20

Unit is pCi/kg, dry wt., 2-sigma counting error.
[a] DOE 1982, Table 19
[b] DOE 1982, Table 20
[c] DOE 2000, Page 4.4

The interisland comparison of the 2011 mean concentrations of ^{137}Cs in lichen from Amchitka and Adak (Table 37) shows that the mean concentration at Adak (19,200 pCi/kg dry wt.) is much higher than that at Amchitka (3,860 pCi/kg dry wt.). Differences between radionuclide concentrations at the two islands are attributed to differing annual rainfall (56 inches at Adak, 33 inches at Amchitka) (Armstrong 1977). The 2011 ^{137}Cs concentrations in lichen from Amchitka and Adak (Table 37) are higher than concentrations from the last sampling event (i.e., 1997), as shown in Table 40.

A complicating factor in evaluating ^{137}Cs results on Amchitka Island is the geographic situation of the island. Located at 51° North, 179° East, fallout would be expected to be at a maximum from detonations at Lop Nor, China (1964–1996), radioactive contamination from the Chernobyl and Fukushima Dai-ichi nuclear power plants (1986 and 2010, respectively), and worldwide fallout that is annually transferred to the troposphere through breaks in the tropopause located at 40° North and 40° South latitudes. Thus, the rates of fallout on Amchitka Island may have varied severalfold within a year from the 1970s to 2010 due to such conditions. This may account for the substantial variability in radionuclide concentrations reported for samples of the same species collected at different times for the year; however, some variability in those values is probably due to ecological and biological factors that affect the metabolic rate of organisms (DOE 2000). Similar conclusions were reported by Seymour and Nelson (1977).

10.0 Summary and Conclusions

DOD and AEC conducted underground nuclear tests during the middle 1960s and early 1970s on Amchitka Island, near the western end of the Aleutian Islands. Radioactive fission products remain in and around the subsurface cavities formed by the nuclear detonations. Data collected since the detonations do not indicate that the radionuclides have migrated from the test cavities to the accessible environment.

The primary focus of LM's long-term stewardship of the Amchitka Island sites is to ensure that conditions at Amchitka remain protective of human health and the environment. This was carried out by collecting data to address the four DQOs discussed in Section 2 of this report.

The first DQO addressed the Aleut consumption of subsistence- and commercial-catch seafood. LM achieved this DQO by collecting samples of marine species near Amchitka and analyzing the samples for selected radioisotopes indicative of the presence of test-related contamination. These radionuclides have other sources, including global fallout and natural occurrence in rocks, such that an understanding of background concentrations is important for monitoring. For the 2011 sampling event, a group of stakeholders that included LM, ADEC, and APIA identified 14 biological species to collect and analyze. A similar sampling event was conducted at Adak Island to assess conditions at a reference location. The species were chosen to represent the subsistence- and commercial-catch seafood present in the western Aleutian Islands.

The risk estimates for the five diets evaluated indicate that overall potential risks to an Aleut from the ingestion of seafood based on the samples collected from Amchitka and Adak in 2011 are similar and are at 2×10^{-5} or lower (i.e., within EPA's acceptable risk range of 1×10^{-6} to 1×10^{-4}). The primary contributors to the risk estimates are the ^{137}Cs and ^{234,235,238}U concentrations.

The risk estimates using Amchitka data are slightly higher than those using Adak data by 1.4×10^{-6}. This is lower than the 1×10^{-5} risk level in excess of background (in this case, estimates from Adak are used as reference or background values) used by the State of Alaska as the benchmark for acceptable risk. Hence, based on the 2011 data collected for Amchitka and Adak, seafood harvested at Amchitka and Adak are considered safe for consumption at the intake levels for the five diets evaluated. These results confirmed earlier investigations, which showed that subsistence- and commercial-catch seafood is safe for human consumption. In addition, the potential increase in cesium concentrations observed in the samples due to the Fukushima Dai-ichi event has not resulted in unacceptable risk estimates.

The second DQO provided the rationale for using biota tissue data collected as input to the RESRAD-BIOTA code to estimate potential risks to these species from the radionuclides. This risk analysis was conducted by deriving representative radionuclide concentrations in seawater based on the tissue data reported for the biological species for comparison with the BCGs for water. The sum of ratios of radionuclide concentrations to BCGs was much lower than the threshold value of 1; therefore, the potential radiation doses to marine species are far below the target dose level of 0.1 rad/day, and no further analysis was required.

The third DQO supported the collection of tritium data in seawater. Tritium is the primary radionuclide at this time that would indicate leakage if concentrations exceed natural or global fallout values. Seawater samples were collected offshore of Amchitka in areas where groundwater may discharge to the sea. The analyses showed that the concentrations of tritium in the marine environment surrounding Amchitka and Adak are similar to global fallout concentrations measured previously by others.

Finally, the fourth DQO supported the collection of reindeer lichen and soil beneath the lichen and marine sediment. The ^{137}Cs concentrations varied significantly between different samples, especially ^{137}Cs concentrations in soil beneath the lichen, for which the maximum values were 5–20 times higher than the minimum values. The lichen and soil beneath the lichen showed that ^{137}Cs levels in Adak were higher than the levels in Amchitka. The concentrations of ^{137}Cs in samples collected from Amchitka and Adak indicate that atmospheric transport of airborne contamination from the Fukushima Dai-ichi event may have contributed to the levels detected.

11.0 References

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Appendix A

Photographs of the Species Sampled

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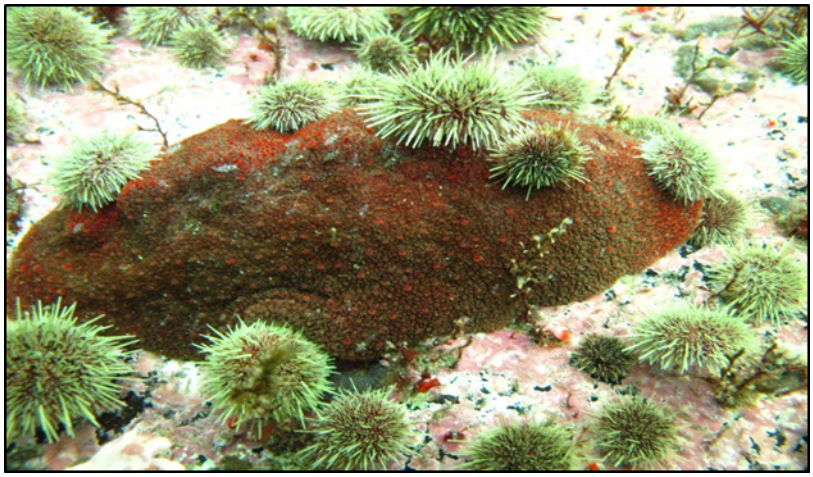
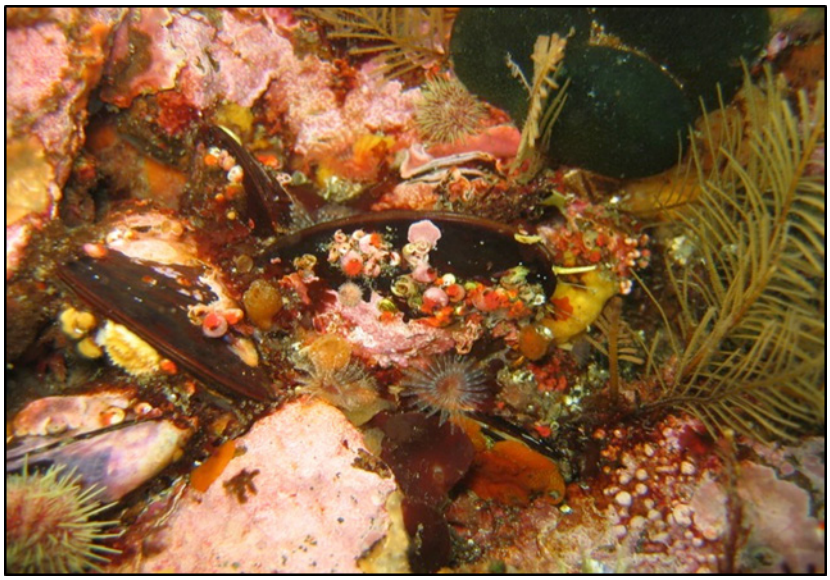
Dragon kelp (*Eualaria fistulosa*)

Rockweed (*Fucus distichus*)

Star reindeer lichen (*Cladina stellaris*)



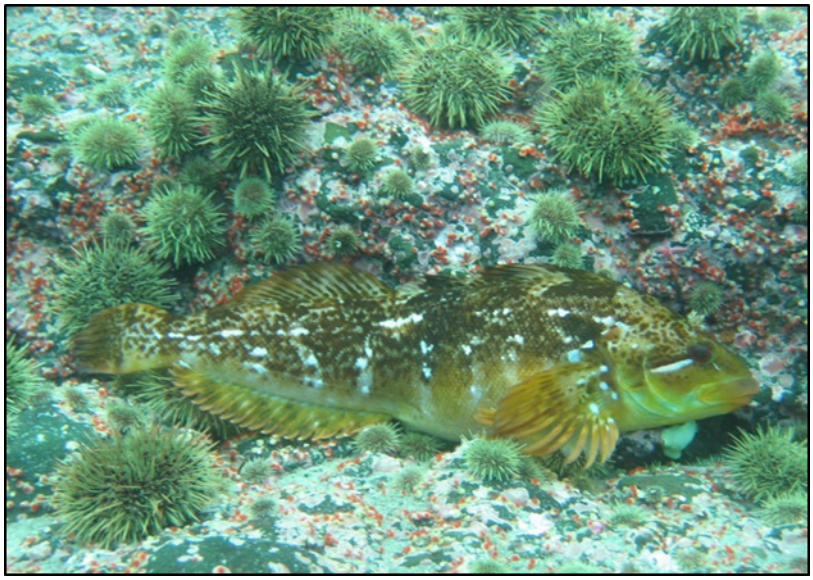
Gumboot or Pacific chiton (*Cryptochiton stelleri*)



Horse mussel (*Modiolus modiolus*)

Sea urchin (*Strongylocentrotus polyacanthus*)

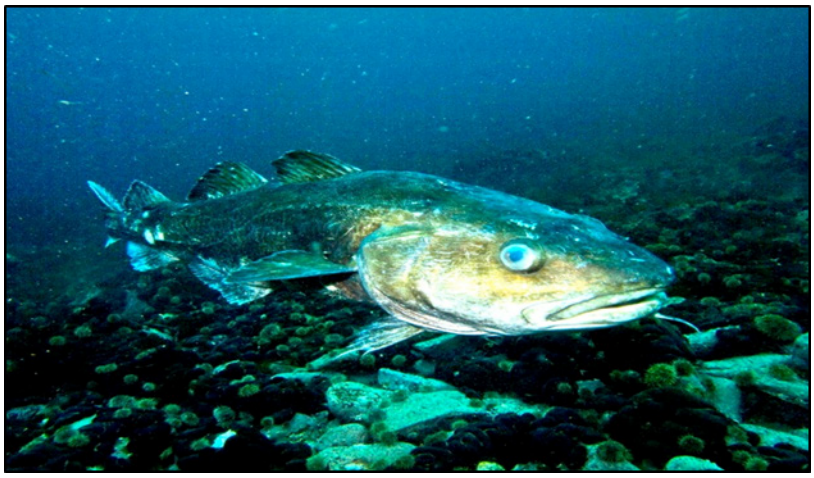
Rockfish (*Sebastes melanops and S. cilatus*)



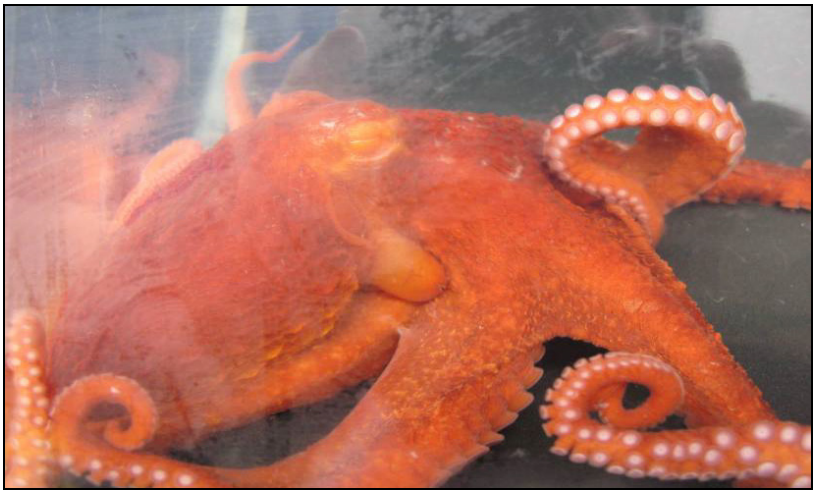
Rock greenling (*Hexagrammos lagocephalus*)

Irish lord (*Hemilepidotus jordani and H. hemilepidotus)*

Pacific halibut (*Hippoglossus stenolepis*)



Pacific cod (*Gadus macrocephalus*)



Octopus (*Enteroctopus dofleini*)

Dolly Varden (*Salvelinus malma*)

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Appendix B

Sample Identification

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Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDQ 874	06/20/2011	17:15	FUCU-ML-DUP	1	4990			
JDQ 865	06/20/2011	17:15	FUCU-ML-MT1-1	1	4990			
JDQ 868	06/20/2011	17:00	FUCU-ML-MT2-1	1	6000			
JET 743	06/20/2011	16:50	SEDI-ML-MT1-2	1	---			
JGR 793	06/21/2011	13:54	FONT-AI-ML-1	1	4000			UAF
JDQ 866	06/21/2011	12:15	FUCU-ML-MT1-2	1	6000			
JDQ 869	06/21/2011	11:53	FUCU-ML-MT2-2	1	5000			
JDQ 870	06/21/2011	11:53	FUCU-ML-MT2-3	1	5000			
JDQ 901	06/21/2011	9:50	SOIL-AI-ML-1	1	1200			3 bags make up sample
JES 503	06/21/2011	9:50	SOIL-AI-ML-1	1	1200			UAF
JDQ 895	06/21/2011	9:50	STRL-AI-ML-1	1	600			
JES 497	06/21/2011	9:50	STRL-AI-ML-1	1	600			UAF
JGR 794	06/22/2011	10:25	FONT-AI-LT1-1	1	6700			UAF; Cloudberry Creek
JGR 795	06/22/2011	10:25	FONT-AI-LT1-DUP	1	6300			UAF; Cloudberry Creek
JDQ 864	06/22/2011	16:45	FUCU-LS-DUP	1	5700			
JDQ 855	06/22/2011	15:25	FUCU-LS-LT1-1	1	5400			
JDQ 856	06/22/2011	15:50	FUCU-LS-LT1-2	1	5500			
JDQ 857	06/22/2011	16:45	FUCU-LS-LT1-3	1	6200			
JDQ 858	06/22/2011	15:15	FUCU-LS-LT2-1	1	7700			
JDQ 859	06/22/2011	15:41	FUCU-LS-LT2-2	1	7500			
JDQ 860	06/22/2011	16:15	FUCU-LS-LT2-3	1	7500			
JET 736	06/22/2011	10:45	LAKE-AI-LT1-1	1	---			Quonset Hut Lake
JET 737	06/22/2011	10:45	LAKE-AI-LT1-DUP	1	---			Quonset Hut Lake
JGR 796	06/22/2011	17:20	SEDI-LS-DD-1	1	---			
JET 741	06/22/2011	17:20	SEDI-LS-DD-1	1	---			
JDQ 902	06/22/2011	11:15	SOIL-AI-LT1-2	1	500			
JES 504	06/22/2011	11:15	SOIL-AI-LT1-2	1	300			UAF
JES 505	06/22/2011	11:15	SOIL-AI-LT1-3	1	300			UAF
JDQ 896	06/22/2011	11:15	STRL-AI-LT1-2	1	700			
JES 498	06/22/2011	11:15	STRL-AI-LT1-2	1	600			UAF
JDQ 845	06/23/2011	12:15	FUCU-CN-CT1-1	1	5200			
JDQ 846	06/23/2011	11:05	FUCU-CN-CT1-2	1	5100			
JDQ 847	06/23/2011	11:30	FUCU-CN-CT1-3	1	6000			
JDQ 854	06/23/2011	12:15	FUCU-CN-DUP	1	5300			
JDQ 903	06/23/2011	13:45	SOIL-AI-CT1-3	1	400			
JDQ 898	06/23/2011	13:45	STRL-AI-CT1-1	1	500			
JES 499	06/23/2011	13:45	STRL-AI-CT1-1	1	800			UAF; no soil collected
JDQ 908	06/24/2011	12:00	DOLL-AI-XXX-1	1	500	36.5	M	
	06/24/2011	12:00	DOLL-AI-XXX-1	1	700	39	M	
	06/24/2011	12:00	DOLL-AI-XXX-1	1	500	34	F	
	06/24/2011	12:00	DOLL-AI-XXX-1	1	400	32	M	
	06/24/2011	12:00	DOLL-AI-XXX-1	1	500	35	M	
JGR 797	06/24/2011	11:25	FONT-AI-CN1-1	1	6600			UAF
JET 744	06/24/2011	11:00	GOOS-AI-XXX-1	5	---			

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDQ 907	06/24/2011	12:00	GWGU-AI-XXX-1	12	100 ea			
JET 738	06/24/2011	9:54	LAKE-AI-CN-1	1	---			
JET 739	06/24/2011	9:54	LAKE-AI-CN-DUP	1	---			
JDQ 772	06/24/2011	21:45	SEAW-CN-C2M-1CAN-D	1	---			Salinity = 34
JDQ 826	06/24/2011	21:50	SEAW-CN-C2M-1CAN-D-DUP	1	---			Salinity = 34
JDQ 771	06/24/2011	21:30	SEAW-CN-C2M-1CAN-S	1	---			Salinity = 33
JDQ 825	06/24/2011	21:35	SEAW-CN-C2M-1CAN-S-DUP	1	---			Salinity = 34
JDQ 776	06/24/2011	22:37	SEAW-CN-C2M-1E-D	1	---			Salinity = 35
JDQ 775	06/24/2011	22:30	SEAW-CN-C2M-1E-S	1	---			Salinity = 35
JDQ 790	06/24/2011	23:07	SEAW-CN-C2M-2D-D	1	---			Salinity = 35
JDQ 789	06/24/2011	22:55	SEAW-CN-C2M-2D-S	1	---			Salinity = 35
JDQ 792	06/24/2011	16:18	SEAW-CN-C2M-2E-D	1	---			Salinity = 35
JDQ 791	06/24/2011	16:03	SEAW-CN-C2M-2E-S	1	---			Salinity = 35
JDQ 794	06/24/2011	15:50	SEAW-CN-C2M-2F-D	1	---			Salinity = 35
JDQ 793	06/24/2011	15:40	SEAW-CN-C2M-2F-S	1	---			Salinity = 35
JDQ 800	06/24/2011	19:55	SEAW-CN-C2M-3B-D	1	---			Salinity = 33
JDQ 799	06/24/2011	19:50	SEAW-CN-C2M-3B-S	1	---			Salinity = 33
JDQ 804	06/24/2011	16:54	SEAW-CN-C2M-3CAN-D	1	---			Salinity = 34
JDQ 803	06/24/2011	16:40	SEAW-CN-C2M-3CAN-S	1	---			Salinity = 34
JDQ 802	06/24/2011	17:45	SEAW-CN-C2M-3C-D	1	---			Salinity = 34
JDQ 801	06/24/2011	17:35	SEAW-CN-C2M-3C-S	1	---			Salinity = 34
JDQ 806	06/24/2011	15:20	SEAW-CN-C2M-3D-D	1	---			Salinity = 35
JDQ 805	06/24/2011	15:00	SEAW-CN-C2M-3D-S	1	---			Salinity = 35
JDQ 808	06/24/2011	20:20	SEAW-CN-C2M-4A-D	1	---			Salinity = 34
JDQ 807	06/24/2011	20:10	SEAW-CN-C2M-4A-S	1	---			Salinity = 34
JDQ 810	06/24/2011	19:15	SEAW-CN-C2M-4B-D	1	---			Salinity = 35
JDQ 809	06/24/2011	18:05	SEAW-CN-C2M-4B-S	1	---			Salinity = 34
JDQ 812	06/24/2011	17:20	SEAW-CN-C2M-5A-D	1	---			Salinity = 34
JDQ 811	06/24/2011	17:10	SEAW-CN-C2M-5A-S	1	---			Salinity = 34
JDQ 814	06/24/2011	22:12	SEAW-CN-C2M-C1-2-D	1	---			Salinity = 35
JDQ 813	06/24/2011	22:05	SEAW-CN-C2M-C1-2-S	1	---			Salinity = 35
JDQ 816	06/24/2011	20:45	SEAW-CN-C2M-C3-4-D	1	---			Salinity = 34
JDQ 815	06/24/2011	20:40	SEAW-CN-C2M-C3-4-S	1	---			Salinity = 34
JDQ 820	06/24/2011	21:15	SEAW-CN-C2M-C4-4-D	1	---			Salinity = 33
JDQ 819	06/24/2011	21:05	SEAW-CN-C2M-C4-4-S	1	---			Salinity = 33
JDQ 824	06/24/2011	23:45	SEAW-CN-C2M-LS2-2-D	1	---			Salinity = 35
JDQ 823	06/24/2011	23:39	SEAW-CN-C2M-LS2-2-S	1	---			Salinity = 35
	06/26/2011		BLCK-AN-ANT1-1	12	---			UAF; Doug Dasher
	06/26/2011		BMUS-AN-ANT1	500	---			UAF; Doug Dasher; Sweeper Cove

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDQ 909	06/27/2011	16:50	DOLL-AD-XXX-1	1	300	31.5	M	North Lake
	06/27/2011	16:50	DOLL-AD-XXX-1	1	100	21.7	F	North Lake
	06/27/2011	16:50	DOLL-AD-XXX-1	1	100	22.9	F	North Lake
	06/27/2011	16:50	DOLL-AD-XXX-1	1	110	21.4	F	North Lake
	06/27/2011	16:50	DOLL-AD-XXX-1	1	110	24.2	F	North Lake
	06/27/2011	19:15	DOLL-AD-XXX-1	1	80	21.9	F	Pond above Mitt Lake
	06/27/2011	19:15	DOLL-AD-XXX-1	1	90	21.8	M	Pond above Mitt Lake
	06/27/2011	19:15	DOLL-AD-XXX-1	1	100	23	F	Pond above Mitt Lake
	06/27/2011	19:15	DOLL-AD-XXX-1	1	100	22	F	Pond above Mitt Lake
	06/27/2011	19:15	DOLL-AD-XXX-1	1	100	21.1	F	Pond above Mitt Lake
	06/27/2011	19:15	DOLL-AD-XXX-1	1	100	23	M	Pond above Mitt Lake
	06/27/2011	19:15	DOLL-AD-XXX-1	1	90	21.6	F	Pond above Mitt Lake
	06/27/2011	19:15	DOLL-AD-XXX-1	1	120	23.4	F	Pond above Mitt Lake
	06/28/2011	16:50	DOLL-AD-XXX-1	1	100	22.2	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	130	25.5	M	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	150	25	M	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	100	22	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	120	23	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	100	24.4	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	100	22.7	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	100	22	M	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	200	25.6	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	110	22.5	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	100	21.6	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	300	26.4	M	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	100	20.6	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	80	19.5	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	100	22.2	F	Tarn
	06/28/2011	16:50	DOLL-AD-XXX-1	1	110	22.3	F	Tarn
JDQ 904	06/28/2011	16:50	SOIL-AD-XXX-1	1	350			
JES 506	06/28/2011	16:50	SOIL-AD-XXX-1	1	150			
JDQ 897	06/28/2011	16:50	STRL-AD-XXX-1	1	650			Above Mitt Lake
JES 500	06/28/2011	16:50	STRL-AD-XXX-1	1	650			Above Mitt Lake
JDQ 905	06/29/2011	16:15	SOIL-AD-XXX-2	1	30			
JES 507	06/29/2011	12:15	SOIL-AD-XXX-2	1	200			UAF
JDQ 906	06/29/2011	19:25	SOIL-AD-XXX-3	1	200			
JES 508	06/29/2011	19:25	SOIL-AD-XXX-3	1	300			UAF
JDQ 899	06/29/2011	12:15	STRL-AD-XXX-2	1	700			
JES 501	06/29/2011	12:15	STRL-AD-XXX-2	1	700			UAF
JDQ 900	06/29/2011	19:25	STRL-AD-XXX-3	1	600			
JES 502	06/29/2011	19:25	STRL-AD-XXX-3	1	650			UAF
	06/30/2011		BMUS-AN-ANT1	1000	---			UAF; Sweeper Cove
JDR 008	07/02/2011	18:40	EUAL-LS-LT3-1	1	5800			
JDR 009	07/02/2011	18:10	EUAL-LS-LT3-2	1	5000			

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDR 010	07/02/2011	18:30	EUAL-LS-LT3-3	1	5100			
JDQ 861	07/02/2011	18:36	FUCU-LS-LT3-1	1	5400			
JDQ 862	07/02/2011	19:04	FUCU-LS-LT3-2	1	5400			
JDQ 863	07/02/2011	19:04	FUCU-LS-LT3-3	1	5500			
JDR 028	07/02/2011	17:30	IRLO-LS-LT3-1	1	500	33.1	F	Composite; Originally labeled as Rockfish
	07/02/2011	17:30	IRLO-LS-LT3-1	1	375	28	M	Composite; Originally labeled as Rockfish
	07/02/2011	17:30	IRLO-LS-LT3-1	1	480	31.1	F	Composite; Originally labeled as Rockfish
JDR 020	07/02/2011	18:10	URCH-LS-LT3-1	2	200			
JDR 013	07/03/2011	14:50	CHIT-LS-LT2-1	2	590			
JDR 014	07/03/2011	10:00	CHIT-LS-LT3-1	2	650			
JES 493	07/03/2011	15:00	EUAL-LS-DUP	1	5200			UAF
JDR 011	07/03/2011	15:00	EUAL-LS-DUP2	1	5650			
JDR 005	07/03/2011	15:00	EUAL-LS-LT2-1	1	5100			
JDR 006	07/03/2011	15:35	EUAL-LS-LT2-2	1	5250			
JDR 007	07/03/2011	15:10	EUAL-LS-LT2-3	1	6000			
JET 752	07/03/2011	14:20	GREN-LS-LT2-2	1	700	38	F	
JET 753	07/03/2011	15:10	GREN-LS-LT2-3	1	700	38.2	F	
JDR 038	07/03/2011	11:30	GREN-LS-LT3-1	1	800	40.3	F	
JDR 017	07/03/2011	10:00	HMUS-LS-LT3-1	1	40			
JDR 035	07/03/2011	12:20	IRLO-LS-LT2-1	1	600	33	F	
JDR 036	07/03/2011	13:45	IRLO-LS-LT2-2	1	540	31.4	F	
JDR 037	07/03/2011	13:50	IRLO-LS-LT2-3	1	500	31.5	M	
JDR 021	07/03/2011	15:25	OCTP-LS-L2M-1	1	184000			
JDR 030	07/03/2011	11:45	ROCK-LS-LT3-3	1	1100	39.8	M	
JDQ 774	07/03/2011	17:54	SEAW-CN-C2M-1D-D	1	---			Salinity = 35
JDQ 773	07/03/2011	17:53	SEAW-CN-C2M-1D-S	1	---			Salinity = 35
JDQ 778	07/03/2011	18:47	SEAW-CN-C2M-1F-D	1	---			Salinity = 35
JDQ 777	07/03/2011	18:39	SEAW-CN-C2M-1F-S	1	---			Salinity = 35
JDQ 780	07/03/2011	18:59	SEAW-CN-C2M-1SB-D	1	---			Salinity = 35
JDQ 827	07/03/2011	19:13	SEAW-CN-C2M-1SB-D-DUP	1	---			Salinity = 35
JDQ 779	07/03/2011	19:03	SEAW-CN-C2M-1SB-S	1	---			Salinity = 35
JDQ 828	07/03/2011	19:08	SEAW-CN-C2M-1SB-S-DUP	1	---			Salinity = 35
JDQ 796	07/03/2011	19:16	SEAW-CN-C2M-2SB-D	1	---			Salinity = 35
JDQ 795	07/03/2011	19:11	SEAW-CN-C2M-2SB-S	1	---			Salinity = 35
JDQ 728	07/03/2011	15:30	SEAW-LS-LT2-1	1	---			Salinity = 33
JDQ 729	07/03/2011	15:20	SEAW-LS-LT2-2	1	---			Salinity = 34
JDQ 730	07/03/2011	15:40	SEAW-LS-LT2-3	1	---			Salinity = 35
JDQ 731	07/03/2011	10:40	SEAW-LS-LT3-1	1	---			Salinity = 35
JDQ 732	07/03/2011	11:00	SEAW-LS-LT3-2	1	---			Salinity = 35
JDQ 733	07/03/2011	11:20	SEAW-LS-LT3-3	1	---			Salinity = 35
JIT 788	07/03/2011	15:30	SEDI-LS-LT2-1	1	---			
JIT 789	07/03/2011	10:40	SEDI-LS-LT3-1	1	---			

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDR 019	07/03/2011	16:00	URCH-LS-LT2-1	6	100 EA			
JDR 012	07/04/2011	15:05	CHIT-LS-LT1-1	1	500			
JDR 002	07/04/2011	14:45	EUAL-LS-LT1-1	1	5250			
JDR 003	07/04/2011	14:55	EUAL-LS-LT1-2	1	6250			
JDR 004	07/04/2011	15:10	EUAL-LS-LT1-3	1	5500			
JDR 032	07/04/2011	15:10	GREN-LS-LT1-1	1	400	32.5	F	
JDR 033	07/04/2011	15:30	GREN-LS-LT1-2	1	600	35.5	F	
JET 751	07/04/2011	12:15	GREN-LS-LT2-1	1	620	35.7	F	
JDR 016	07/04/2011	9:30	HMUS-LS-LT2-1	15	610			
JDR 039	07/04/2011	14:45	IRLO-LS-LT1-1	1	500	32.6	M	
JDR 040	07/04/2011	14:55	IRLO-LS-LT1-2	1	500	37	M	
JDR 044	07/04/2011	9:30	PCOD-LS-L2M-1	1	7600	90	M	
JDR 022	07/04/2011	15:00	ROCK-LS-LT1-1	1	600	36.4	F	
JDR 025	07/04/2011	9:30	ROCK-LS-LT2-1	1	1000	37.6	M	
JDQ 725	07/04/2011	15:00	SEAW-LS-LT1-1	1	---			Salinity = 36
JDQ 726	07/04/2011	14:45	SEAW-LS-LT1-2	1	---			Salinity = 36
JDQ 727	07/04/2011	9:56	SEAW-LS-LT1-3	1	---			Salinity = 36
JIT 787	07/04/2011	15:00	SEDI-LS-LT1-1	1	---			
JDR 018	07/04/2011	15:02	URCH-LS-LT1-1	5	600			
JDQ 971	07/05/2011	15:40	CHIT-CN-CT3-1	2	500			
JDQ 965	07/05/2011	15:15	EUAL-CN-CT3-1	1	5900			
JDQ 966	07/05/2011	15:40	EUAL-CN-CT3-2	1	5200			
JDQ 967	07/05/2011	15:30	EUAL-CN-CT3-3	1	5800			
JDQ 995	07/05/2011	15:30	GREN-CN-CT3-1	1	650	37	F	
JDQ 996	07/05/2011	15:45	GREN-CN-CT3-2	1	700	36.7	M	
JDQ 997	07/05/2011	16:00	GREN-CN-CT3-3	1	800	38.8	F	
JDR 034	07/05/2011	10:12	GREN-LS-LT1-3	1	500	34.6	F	
JDQ 974	07/05/2011	16:10	HMUS-CN-CT3-1	16	500			
JDR 015	07/05/2011	9:57	HMUS-LS-LT1-1	12	500			
JET 747	07/05/2011	14:45	IRLO-CN-CT2-2	1	300	27.9	F	
JET 747	07/05/2011	14:45	IRLO-CN-CT2-2	1	340	27.6	F	
JDQ 999	07/05/2011	16:10	IRLO-CN-CT3-1	1	550	32.7	F	
JET 746	07/05/2011	15:30	IRLO-CN-CT3-2	1	840	42.6	F	
JDR 041	07/05/2011	10:15	IRLO-LS-LT1-3	1	900	42.2	U	
JDQ 706	07/05/2011	15:30	SEAW-CN-CT3-1	1	---			Salinity = 35
JDQ 707	07/05/2011	15:20	SEAW-CN-CT3-2	1	---			Salinity = 35
JIT 786	07/05/2011	15:30	SEDI-CN-CT3-1	1	---			
JDQ 977	07/05/2011	16:00	URCH-CN-CT3-1	6	750			
JDQ 962	07/06/2011	16:15	EUAL-CN-CT2-1	1	5550			
JDQ 963	07/06/2011	16:25	EUAL-CN-CT2-2	1	5250			
JDQ 723	07/06/2011	9:35	EUAL-CN-DUP	1	5450			UAF
JDQ 968	07/06/2011	9:35	EUAL-CN-DUP	1	5250			
JDQ 851	07/06/2011	10:49	FUCU-CN-CT3-1	1	5350			
JDQ 852	07/06/2011	11:19	FUCU-CN-CT3-2	1	5350			

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDQ 853	07/06/2011	11:43	FUCU-CN-CT3-3	1	5450			
JDR 001	07/06/2011	14:55	PCOD-CN-C2M-1	1	3300	63.8	F	2 bags for sample
	07/06/2011	14:55	PCOD-CN-C2M-1	1	2000	57.4	M	
JDQ 982	07/06/2011	14:30	ROCK-CN-CT2-1	1	1200	40.7	U	
JDQ 983	07/06/2011	15:00	ROCK-CN-CT2-2	1	975	36.5	M	
JDQ 984	07/06/2011	15:15	ROCK-CN-CT2-3	1	1050	39	M	
JDQ 985	07/06/2011	9:50	ROCK-CN-CT3-1	1	1150	40.8	F	
JDQ 986	07/06/2011	9:55	ROCK-CN-CT3-2	1	1250	41.1	F	
JDQ 987	07/06/2011	10:10	ROCK-CN-CT3-3	1	900	35.5	M	
JDQ 988	07/06/2011	10:20	ROCK-CN-DUP	1	900	35.5	M	
JDQ 770	07/06/2011	15:35	SEAW-CN-C2M-1C-D	1	---			Salinity = 35
JDQ 769	07/06/2011	15:28	SEAW-CN-C2M-1C-S	1	---			Salinity = 35
JDQ 782	07/06/2011	14:35	SEAW-CN-C2M-2A-D	1	---			Salinity = 35
JDQ 781	07/06/2011	14:25	SEAW-CN-C2M-2A-S	1	---			Salinity = 35
JDQ 784	07/06/2011	14:57	SEAW-CN-C2M-2B-D	1	---			Salinity = 34
JDQ 830	07/06/2011	15:05	SEAW-CN-C2M-2B-D-DUP	1	---			Salinity = 34
JDQ 783	07/06/2011	14:43	SEAW-CN-C2M-2B-S	1	---			Salinity = 35
JDQ 829	07/06/2011	14:50	SEAW-CN-C2M-2B-S-DUP	1	---			Salinity = 35
JDQ 788	07/06/2011	13:20	SEAW-CN-C2M-2CAN-D	1	---			Salinity = 35
JDQ 787	07/06/2011	13:10	SEAW-CN-C2M-2CAN-S	1	---			Salinity = 35
JDQ 786	07/06/2011	14:00	SEAW-CN-C2M-2C-D	1	---			Salinity = 35
JDQ 785	07/06/2011	13:51	SEAW-CN-C2M-2C-S	1	---			Salinity = 35
JDQ 798	07/06/2011	14:18	SEAW-CN-C2M-3A-D	1	---			Salinity = 35
JDQ 797	07/06/2011	14:10	SEAW-CN-C2M-3A-S	1	---			Salinity = 35
JDQ 818	07/06/2011	13:40	SEAW-CN-C2M-C4-1-D	1	---			Salinity = 35
JDQ 817	07/06/2011	13:30	SEAW-CN-C2M-C4-1-S	1	---			Salinity = 35
JDQ 822	07/06/2011	15:20	SEAW-CN-C2M-C5-1-D	1	---			Salinity = 34
JDQ 821	07/06/2011	15:14	SEAW-CN-C2M-C5-1-S	1	---			Salinity = 35
JDQ 703	07/06/2011	14:30	SEAW-CN-CT2-1	1	---			Salinity = 35
JDQ 708	07/06/2011	9:40	SEAW-CN-CT3-3	1	---			Salinity = 35
JDQ 724	07/06/2011	9:45	SEAW-CN-DUP	1	---			Salinity = 35
JIT 785	07/06/2011	16:30	SEDI-CN-CT2-1	1	---			
JDQ 970	07/07/2011	15:00	CHIT-CN-CT2-1	4	585			
JDQ 964	07/07/2011	10:45	EUAL-CN-CT2-3	1	5450			
JDQ 992	07/07/2011	14:40	GREN-CN-CT2-1	1	800	37.9	F	
JDQ 993	07/07/2011	14:50	GREN-CN-CT2-2	1	650	36.3	F	
JDQ 994	07/07/2011	14:55	GREN-CN-CT2-3	1	750	37.7	F	
JDQ 973	07/07/2011	15:00	HMUS-CN-CT2-1	15	500			
JET 748	07/07/2011	10:40	IRLO-CN-CT2-1	1	450	30.9	F	Composite
	07/07/2011	10:40	IRLO-CN-CT2-1	1	400	27.9	M	Composite
JET 750	07/07/2011	14:55	IRLO-CN-CT2-3	1	850	40.6	F	
JET 749	07/07/2011	15:40	IRLO-CN-CT3-3	1	350	28.9	F	
	07/07/2011	15:40	IRLO-CN-CT3-3	1	400	33.7	U	

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDQ 704	07/07/2011	10:15	SEAW-CN-CT2-2	1	---			Salinity = 35
JDQ 705	07/07/2011	10:20	SEAW-CN-CT2-3	1	---			Salinity = 32
JDQ 976	07/07/2011	10:27	URCH-CN-CT2-1	4	500			
JDQ 969	07/08/2011	10:50	CHIT-CN-CT1-1	3	500			
JDQ 718	07/08/2011	10:30	EUAL-CN-CT1-1	1	5500			
JDQ 960	07/08/2011	10:50	EUAL-CN-CT1-2	1	5700			
JDQ 961	07/08/2011	10:50	EUAL-CN-CT1-3	1	5600			
JDQ 848	07/08/2011	17:45	FUCU-CN-CT2-1	1	5450			
JDQ 849	07/08/2011	17:55	FUCU-CN-CT2-2	1	5600			
JDQ 989	07/08/2011	10:50	GREN-CN-CT1-1	1	650	36.6	F	
JDQ 990	07/08/2011	10:25	GREN-CN-CT1-2	1	550	35.4	F	
JDQ 991	07/08/2011	10:30	GREN-CN-CT1-3	1	650	36.6	M	
JDQ 998	07/08/2011	14:25	GREN-CN-DUP	1	600	35.5	F	
JDQ 972	07/08/2011	10:37	HMUS-CN-CT1-1	12	505			
JIV 536	07/08/2011	10:37	IRLO-CN-CT1-1	1	250	24	F	Composite
	07/08/2011	10:37	IRLO-CN-CT1-1	1	300	26.5	M	Composite
JIV 537	07/08/2011	15:25	IRLO-CN-CT1-2	1	450	28.7	F	Composite
	07/08/2011	15:25	IRLO-CN-CT1-2	1	400	29.5	F	Composite
JIV 538	07/08/2011	15:15	IRLO-CN-CT1-3	1	500	31.1	F	
JDQ 978	07/08/2011	17:00	OCTP-CN-C2M-1	1	210			DUP; Composite; 2 bags for sample
JDQ 978	07/08/2011	17:00	OCTP-CN-C2M-1	1	850			DUP; Composite
JDQ 979	07/08/2011	14:30	ROCK-CN-CT1-1	1	850	36.3	F	
JDQ 980	07/08/2011	14:45	ROCK-CN-CT1-2	1	1200	40.1	F	
JDQ 981	07/08/2011	15:00	ROCK-CN-CT1-3	1	1000	37.7	M	
JDQ 766	07/08/2011	16:56	SEAW-CN-C2M-1A-D	1	---			Salinity = 35
JDQ 765	07/08/2011	16:47	SEAW-CN-C2M-1A-S	1	---			Salinity = 35
JDQ 768	07/08/2011	17:20	SEAW-CN-C2M-1B-D	1	---			Salinity = 35
JDQ 767	07/08/2011	17:10	SEAW-CN-C2M-1B-S	1	---			Salinity = 35
JDQ 700	07/08/2011	10:40	SEAW-CN-CT1-1	1	---			Salinity = 35
JDQ 701	07/08/2011	10:28	SEAW-CN-CT1-2	1	---			Salinity = 35
JDQ 702	07/08/2011	10:37	SEAW-CN-CT1-3	1	---			Salinity = 35
JIT 784	07/08/2011	10:45	SEDI-CN-CT1-1	1	---			
JDQ 975	07/08/2011	10:40	URCH-CN-CT1-1	6	500			
JDR 055	07/09/2011	13:15	CHIT-ML-MT1-1	4	500			
JDR 054	07/09/2011	16:45	EUAL-ML-DUP	1	5500			
JDR 045	07/09/2011	13:05	EUAL-ML-MT1-1	1	5500			
JDR 046	07/09/2011	13:15	EUAL-ML-MT1-2	1	5200			
JDR 047	07/09/2011	13:10	EUAL-ML-MT1-3	1	5600			
JDQ 867	07/09/2011	14:35	FUCU-ML-MT1-3	1	5300			
JDR 075	07/09/2011	15:10	GREN-ML-MT1-1	1	700	36.5	M	
JDR 076	07/09/2011	13:05	GREN-ML-MT1-2	1	750	39.1		
JDR 077	07/09/2011	15:40	GREN-ML-MT1-3	1	800	38.4	F	
JDR 058	07/09/2011	17:40	HMUS-ML-MT1-1	10	500			
JDR 085	07/09/2011	13:10	IRLO-ML-MT1-1	1	400	29	F	Composite

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
	07/09/2011	13:10	IRLO-ML-MT1-1	1	400	30.6	F	Composite
JET 757	07/09/2011	13:00	IRLO-ML-MT1-2	1	425	30	F	Composite
	07/09/2011	13:00	IRLO-ML-MT1-2	1	400	28	F	Composite
JET 758	07/09/2011	12:30	IRLO-ML-MT1-3	1	500	31.4	F	
JET 759	07/09/2011	16:00	ROCK-ML-DUP	1	950	37.8	F	
JDR 065	07/09/2011	12:20	ROCK-ML-MT1-1	1	1050	40.8	F	
JDR 066	07/09/2011	13:15	ROCK-ML-MT1-2	1	800	36.3	M	
JDR 067	07/09/2011	15:00	ROCK-ML-MT1-3	1	900	37.6	M	
JDQ 744	07/09/2011	13:05	SEAW-ML-DUP	1	---			Salinity = 36
JDQ 735	07/09/2011	12:55	SEAW-ML-MT1-1	1	---			Salinity = 36
JDQ 736	07/09/2011	12:47	SEAW-ML-MT1-2	1	---			Salinity = 34
JDQ 737	07/09/2011	13:00	SEAW-ML-MT1-3	1	---			Salinity = 36
JIT 790	07/09/2011	13:10	SEDI-ML-MT1-1	1	---			
JDR 061	07/09/2011	13:10	URCH-ML-MT1-1	9	830			
JDR 056	07/10/2011	17:15	CHIT-ML-MT2-1	2	560			
JDR 057	07/10/2011	10:50	CHIT-ML-MT3-1	2	500			
JDR 048	07/10/2011	17:00	EUAL-ML-MT2-1	1	5000			
JDR 049	07/10/2011	17:00	EUAL-ML-MT2-2	1	5600			
JDR 050	07/10/2011	17:30	EUAL-ML-MT2-3	1	5600			
JDR 051	07/10/2011	10:40	EUAL-ML-MT3-1	1	5400			
JDR 052	07/10/2011	10:55	EUAL-ML-MT3-2	1	5200			
JDR 053	07/10/2011	10:30	EUAL-ML-MT3-3	1	5300			
JDQ 871	07/10/2011	15:00	FUCU-ML-MT3-1	1	5500			
JDQ 872	07/10/2011	15:10	FUCU-ML-MT3-2	1	5500			
JDQ 873	07/10/2011	15:20	FUCU-ML-MT3-3	1	5300			
JDR 084	07/10/2011	12:30	GREN-ML-DUP	1	600	36	F	
JDR 081	07/10/2011	12:10	GREN-ML-MT3-1	1	675	36.9	F	
JDR 082	07/10/2011	11:55	GREN-ML-MT3-2	1	550	34.3	F	
JDR 083	07/10/2011	12:10	GREN-ML-MT3-3	1	600	35.7	F	
JDR 060	07/10/2011	11:10	HMUS-ML-MT3-1	15	500			
JIV 541	07/10/2011	17:15	IRLO-ML-MT2-1	1	350	27.4	M	
	07/10/2011	17:15	IRLO-ML-MT2-1	1	400	29.2	F	
JET 760	07/10/2011	11:00	IRLO-ML-MT3-1	1	860	42.5	F	
JIV 539	07/10/2011	10:30	IRLO-ML-MT3-2	1	800	40	F	
JIV 540	07/10/2011	11:00	IRLO-ML-MT3-3	1	900	42.7	F	
JDR 064	07/10/2011	17:00	OCTP-ML-M2M-1	1	400		M	Composite
	07/10/2011	17:00	OCTP-ML-M2M-1	1	300		M	Composite
JDR 087	07/10/2011	16:30	PCOD-ML-M2M-1	1	1300	50	F	Composite
	07/10/2011	16:30	PCOD-ML-M2M-1	1	1000	46.5	F	Composite
	07/10/2011	16:30	PCOD-ML-M2M-1	1	700	42.4	M	Composite
	07/10/2011	16:30	PCOD-ML-M2M-1	1	2150			Composite
JDR 071	07/10/2011	10:15	ROCK-ML-MT3-1	1	800	37	M	
JDR 072	07/10/2011	14:30	ROCK-ML-MT3-2	1	1300	43.7	M	
JDR 073	07/10/2011	14:25	ROCK-ML-MT3-3	1	2100	47.3	F	

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDQ 738	07/10/2011	17:00	SEAW-ML-MT2-1	1	---			Salinity = 34
JDQ 739	07/10/2011	17:05	SEAW-ML-MT2-2	1	---			Salinity = 34
JDQ 740	07/10/2011	17:05	SEAW-ML-MT2-3	1	---			Salinity = 34
JDQ 741	07/10/2011	10:50	SEAW-ML-MT3-1	1	---			Salinity = 35
JDQ 742	07/10/2011	11:00	SEAW-ML-MT3-2	1	---			Salinity = 35
JDQ 743	07/10/2011	11:10	SEAW-ML-MT3-3	1	---			Salinity = 34
JIT 792	07/10/2011	11:15	SEDI-ML-MT3-1	1	---			UAF
JDR 062	07/10/2011	17:20	URCH-ML-MT2-1	7	695			
JDR 063	07/10/2011	11:20	URCH-ML-MT3-1	7	560			
JES 494	07/11/2011	10:50	EUAL-ML-DUP2	1	4200			
JDR 078	07/11/2011	11:10	GREN-ML-MT2-1	1	600	35.2	F	
JDR 079	07/11/2011	10:35	GREN-ML-MT2-2	1	600	35.1	F	
JDR 080	07/11/2011	10:40	GREN-ML-MT2-3	1	625	36.4	F	
JDR 086	07/11/2011	15:30	HALI-ML-M2M-1	1	5800			
JDR 059	07/11/2011	11:30	HMUS-ML-MT2-1	17	535			
JDR 068	07/11/2011	10:00	IRLO-ML-MT2-2	1	500	31.3	F	
JDR 069	07/11/2011	10:20	IRLO-ML-MT2-3	1	200	22.8	M	
	07/11/2011	10:20	IRLO-ML-MT2-3	1	300	26.3	F	
JIV 555	07/11/2011	13:30	ROCK-ML-MT2-1	1	900	37.5	F	
JIV 556	07/11/2011	13:45	ROCK-ML-MT2-2	1	800	35	M	
JDR 070	07/11/2011	14:00	ROCK-ML-MT2-3	1	900	36	M	
JIT 791	07/11/2011	11:20	SEDI-ML-MT2-1	1	---			
JDQ 850	07/12/2011	17:30	FUCU-CN-CT2-3	1	5200			
JIW 344	07/12/2011	14:30	GREN-LS-DUP	1	700	39	F	
JIW 342	07/12/2011	14:00	GREN-LS-LT3-2	1	650	37.2	F	
JIW 343	07/12/2011	14:15	GREN-LS-LT3-3	1	600	35.4	F	
JDR 042	07/12/2011	12:10	IRLO-LS-LT3-1	1	850	41.5	M	
JET 755	07/12/2011	12:15	IRLO-LS-LT3-3	1	1100	44.2	M	
JDR 031	07/12/2011	13:17	ROCK-LS-DUP	1	1000	39	F	
JDR 027	07/12/2011	16:30	ROCK-LS-DUP2	1	1100	39.1	M	
JDR 023	07/12/2011	16:05	ROCK-LS-LT1-2	1	900	37.1	F	
JDR 024	07/12/2011	16:30	ROCK-LS-LT1-3	1	1000	38.4	F	
JDR 026	07/12/2011	15:10	ROCK-LS-LT2-2	1	900	36.5	M	
JET 754	07/12/2011	13:10	ROCK-LS-LT3-1	1	1000	38.4	F	
JDR 029	07/12/2011	13:12	ROCK-LS-LT3-2	1	1150	40.5	F	
JDQ 734	07/12/2011	15:00	SEAW-LS-DUP	1	---			Diver collected with NISKIN; Salinity = 35
JDR 000	07/13/2011	8:30	HALI-CN-C2M-1	1	9000	915	F	
JDR 043	07/13/2011	9:29	HALI-LS-L2M-1	1	13750	1000	F	
JDR 143	07/14/2011	10:20	CHIT-AS-AST3-1	2	550			
JDR 137	07/14/2011	14:45	EUAL-AS-AST3-1	1	5650			
JDR 138	07/14/2011	14:45	EUAL-AS-AST3-2	1	5100			
JDR 139	07/14/2011	14:25	EUAL-AS-AST3-3	1	5400			
JDR 140	07/14/2011	10:15	EUAL-AS-DUP	1	5550			
JDQ 891	07/14/2011	16:15	FUCU-AS-AST3-1	1	5250			

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDQ 892	07/14/2011	16:20	FUCU-AS-AST3-2	1	5750			
JDQ 893	07/14/2011	16:25	FUCU-AS-AST3-3	1	6900			
JDR 167	07/14/2011	10:10	GREN-AS-AST3-1	1	300	28.2	F	
	07/14/2011	10:10	GREN-AS-AST3-1	1	350	31	F	
JDR 168	07/14/2011	10:20	GREN-AS-AST3-2	1	500	35.5	F	
JDR 169	07/14/2011	14:20	GREN-AS-AST3-3	1	500	32.9	F	
JDR 170	07/14/2011	14:30	GREN-AS-DUP	1	600	35.5	F	
JDR 146	07/14/2011	14:40	HMUS-AS-AST3-1	9	500			
JDR 171	07/14/2011	14:45	IRLO-AS-AST3-1	1	350	25.1	F	Composite
	07/14/2011	14:45	IRLO-AS-AST3-1	1	650	37.6	F	Composite
JET 766	07/14/2011	14:25	IRLO-AS-AST3-2	1	800	38	F	
JET 767	07/14/2011	14:30	IRLO-AS-AST3-3	1	1000	42.9	M	
JDR 157	07/14/2011	10:10	ROCK-AS-AST3-1	1	800	36.9	F	
JDR 158	07/14/2011	10:16	ROCK-AS-AST3-2	1	550	32.6	F	
JDR 159	07/14/2011	10:29	ROCK-AS-AST3-3	1	1275	43.2	M	
JDR 160	07/14/2011	14:20	ROCK-AS-DUP	1	1500	44.4	F	
JDQ 761	07/14/2011	14:25	SEAW-AS-AST3-1	1	---			Salinity = 36
JDQ 762	07/14/2011	14:45	SEAW-AS-AST3-2	1	---			Salinity = 35
JDQ 763	07/14/2011	14:30	SEAW-AS-AST3-3	1	---			Salinity = 37
JDQ 764	07/14/2011	14:40	SEAW-AS-DUP	1	---			Salinity = 36
JIT 798	07/14/2011	14:25	SEDI-AS-AST3-1	1	---			UAF
JDR 149	07/14/2011	14:30	URCH-AS-AST3-1	5	500			
JDR 141	07/15/2011	10:25	CHIT-AS-AST1-1	4	560			
JDR 131	07/15/2011	10:52	EUAL-AS-AST1-1	1	5300			
JDR 132	07/15/2011	10:40	EUAL-AS-AST1-2	1	5000			
JDR 133	07/15/2011	10:30	EUAL-AS-AST1-3	1	5300			
JES 495	07/15/2011	10:30	EUAL-AS-DUP2	1	5200			
JDR 161	07/15/2011	10:25	GREN-AS-AST1-1	1	600	34.5	F	
JDR 162	07/15/2011	10:40	GREN-AS-AST1-2	1	600	35.4	F	
JDR 163	07/15/2011	10:47	GREN-AS-AST1-3	1	600	34.5	F	
JDR 144	07/15/2011	10:37	HMUS-AS-AST1-1	17	500			
JET 768	07/15/2011	10:40	IRLO-AS-AST1-1	1	500	31.7	F	
JET 769	07/15/2011	10:50	IRLO-AS-AST1-2	1	650	34.6	F	
JET 770	07/15/2011	11:20	IRLO-AS-AST1-3	1	600	32.8	F	
JDR 173	07/15/2011	14:50	PCOD-AS-AS2M-1	1	1775	56.2	M	Composite
	07/15/2011	14:50	PCOD-AS-AS2M-1	1	5200	70.5	M	Composite
JDR 151	07/15/2011	10:45	ROCK-AS-AST1-1	1	500	30.5	M	
JDR 152	07/15/2011	11:00	ROCK-AS-AST1-2	1	850	35.6	M	
JDR 153	07/15/2011	11:05	ROCK-AS-AST1-3	1	1500	43.5	M	
JDQ 755	07/15/2011	10:55	SEAW-AS-AST1-1	1	---			Salinity = 34
JDQ 756	07/15/2011	10:51	SEAW-AS-AST1-2	1	---			Salinity = 35
JDQ 757	07/15/2011	10:33	SEAW-AS-AST1-3	1	---			Salinity = 35
JIT 796	07/15/2011	10:40	SEDI-AS-AST1-1	1	---			
JDR 147	07/15/2011	10:47	URCH-AS-AST1-1	5	620			

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDR 142	07/16/2011	10:20	CHIT-AS-AST2-1	3	940			
JDR 134	07/16/2011	10:20	EUAL-AS-AST2-1	1	5300			
JDR 135	07/16/2011	10:30	EUAL-AS-AST2-2	1	5500			
JDR 136	07/16/2011	10:05	EUAL-AS-AST2-3	1	5200			
JDQ 885	07/16/2011	11:37	FUCU-AS-AST1-1	1	5300			
JDQ 886	07/16/2011	11:48	FUCU-AS-AST1-2	1	5400			
JDQ 887	07/16/2011	12:10	FUCU-AS-AST1-3	1	5100			
JDQ 888	07/16/2011	15:45	FUCU-AS-AST2-1	1	5200			
JDQ 889	07/16/2011	16:15	FUCU-AS-AST2-2	1	5300			
JDQ 890	07/16/2011	16:44	FUCU-AS-AST2-3	1	5200			
JDQ 894	07/16/2011	11:44	FUCU-AS-DUP	1	5300			
JDR 164	07/16/2011	10:12	GREN-AS-AST2-1	1	900	40.1	M	
JDR 165	07/16/2011	9:55	GREN-AS-AST2-2	1	650	36.1	F	
JDR 166	07/16/2011	10:12	GREN-AS-AST2-3	1	700	38.7	F	
JDR 145	07/16/2011	10:18	HMUS-AS-AST2-1	6	550			
JIV 545	07/16/2011	14:40	IRLO-AS-AST2-1	1	600	32.9	M	
JIV 546	07/16/2011	14:45	IRLO-AS-AST2-2	1	500	31.9	F	
JIV 547	07/16/2011	18:10	IRLO-AS-AST2-3	1	650	34.4	F	
JDR 154	07/16/2011	13:25	ROCK-AS-AST2-1	1	800	36.8	M	
JDR 155	07/16/2011	13:30	ROCK-AS-AST2-2	1	1225	40.8	F	
JDR 156	07/16/2011	13:50	ROCK-AS-AST2-3	1	950	38.4	M	
JDQ 758	07/16/2011	10:00	SEAW-AS-AST2-1	1	---			Salinity = 35
JDQ 759	07/16/2011	10:00	SEAW-AS-AST2-2	1	---			Salinity = 35
JDQ 760	07/16/2011	10:15	SEAW-AS-AST2-3	1	---			Salinity = 35
JIT 797	07/16/2011	10:00	SEDI-AS-AST2-1	1	---			
JDR 148	07/16/2011	10:15	URCH-AS-AST2-1	7	530			
JDR 100	07/17/2011	16:30	CHIT-AN-ANT3-1	3	950			
JDR 094	07/17/2011	16:30	EUAL-AN-ANT3-1	1	5100			
JDR 095	07/17/2011	16:25	EUAL-AN-ANT3-2	1	5600			
JDR 096	07/17/2011	16:15	EUAL-AN-ANT3-3	1	5100			
JDR 097	07/17/2011	16:25	EUAL-AN-DUP	1	5700			
JES 496	07/17/2011	16:25	EUAL-AN-DUP	1	5700			UAF; DUP
JDR 124	07/17/2011	16:15	GREN-AN-ANT3-1	1	550	35.9	F	
JDR 125	07/17/2011	16:40	GREN-AN-ANT3-2	1	650	36.2	F	
JDR 126	07/17/2011	16:10	GREN-AN-ANT3-3	1	550	36.4	F	
JDR 127	07/17/2011	16:10	GREN-AN-DUP	1	525	35.9	F	
JDR 129	07/17/2011	14:30	HALI-AN-AN2M-1	1	27215	122	F	
JET 761	07/17/2011	14:20	HALI-AN-DUP	1	5000	105	F	
JDR 128	07/17/2011	16:40	IRLO-AN-ANT3-1	1	750	36.4	F	
JET 762	07/17/2011	16:10	IRLO-AN-ANT3-2	1	825	36.7	F	
JET 763	07/17/2011	16:45	IRLO-AN-ANT3-3	1	400	28.6	M	Composite
JET 763	07/17/2011	16:45	IRLO-AN-ANT3-3	1	400	29	F	Composite
JDR 130	07/17/2011	15:30	PCOD-AN-AN2M-1	1	3100	66.6	U	Composite
	07/17/2011	15:30	PCOD-AN-AN2M-1	1	2100	58.7	F	Composite

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JDR 114	07/17/2011	16:25	ROCK-AN-ANT3-1	1	1050	38.7	M	
JDR 115	07/17/2011	16:10	ROCK-AN-ANT3-2	1	1200	40	M	
JDR 116	07/17/2011	16:20	ROCK-AN-ANT3-3	1	200	23.5	M	Composite
	07/17/2011	16:20	ROCK-AN-ANT3-3	1	400	27	M	Composite
JDQ 751	07/17/2011	16:35	SEAW-AN-ANT3-1	1	---			Salinity = 35
JDQ 752	07/17/2011	16:20	SEAW-AN-ANT3-2	1	---			Salinity = 35
JDQ 753	07/17/2011	16:15	SEAW-AN-ANT3-3	1	---			Salinity = 35
JDQ 754	07/17/2011	16:25	SEAW-AN-DUP	1	---			Salinity = 35
JIT 795	07/17/2011	16:20	SEDI-AN-ANT3-1	1	---			
JDR 106	07/17/2011	16:40	URCH-AN-ANT3-1	5	750			
JDR 099	07/18/2011	15:40	CHIT-AN-ANT2-1	3	910			
JDR 091	07/18/2011	16:15	EUAL-AN-ANT2-1	1	5500			
JDR 092	07/18/2011	16:00	EUAL-AN-ANT2-2	1	5800			
JDR 093	07/18/2011	15:30	EUAL-AN-ANT2-3	1	5150			
JDQ 878	07/18/2011	14:11	FUCU-AN-ANT2-1	1	5200			
JDQ 879	07/18/2011	16:57	FUCU-AN-ANT2-2	1	5400			
JDQ 880	07/18/2011	17:35	FUCU-AN-ANT2-3	1	5430			
JDQ 881	07/18/2011	9:02	FUCU-AN-ANT3-1	1	5200			
JDQ 882	07/18/2011	13:00	FUCU-AN-ANT3-2	1	5100			
JDQ 883	07/18/2011	13:35	FUCU-AN-ANT3-3	1	5300			
JDQ 884	07/18/2011	13:00	FUCU-AN-DUP	1	5200			
JDR 121	07/18/2011	15:40	GREN-AN-ANT2-1	1	600	36.8	F	
JDR 122	07/18/2011	15:40	GREN-AN-ANT2-2	1	650	38	F	
JDR 123	07/18/2011	15:43	GREN-AN-ANT2-3	1	550	34.7	F	
JDR 102	07/18/2011	16:00	HMUS-AN-ANT2-1	5	530			
JDR 103	07/18/2011	10:30	HMUS-AN-ANT3-1	7	500			
JDR 107	07/18/2011	16:00	OCTP-AN-AN2M-1	3	1200			
JDR 111	07/18/2011	16:00	ROCK-AN-ANT2-1	1	2500	51.5	F	
JDR 112	07/18/2011	16:10	ROCK-AN-ANT2-2	1	1700	47.5	M	
JDQ 748	07/18/2011	15:25	SEAW-AN-ANT2-1	1	---			Salinity = 35
JDQ 749	07/18/2011	15:30	SEAW-AN-ANT2-2	1	---			Salinity = 35
JDQ 750	07/18/2011	15:40	SEAW-AN-ANT2-3	1	---			Salinity = 35
JIT 794	07/18/2011	15:20	SEDI-AN-ANT2-1	1	---			
JDR 105	07/18/2011	15:50	URCH-AN-ANT2-1	9	820			
JDR 088	07/19/2011	14:55	EUAL-AN-ANT1-1	1	5200			
JDR 089	07/19/2011	14:50	EUAL-AN-ANT1-2	1	5600			
JDR 090	07/19/2011	14:40	EUAL-AN-ANT1-3	1	5200			
JDQ 875	07/19/2011	13:09	FUCU-AN-ANT1-1	1	5300			
JDR 118	07/19/2011	14:38	GREN-AN-ANT1-1	1	500	33.9	M	
JDR 119	07/19/2011	14:45	GREN-AN-ANT1-2	1	525	34.3	M	
JDR 120	07/19/2011	14:55	GREN-AN-ANT1-3	1	675	36.6	F	

Ticket	Sample Date	Time	Location	Number Species Sample	Weight (g)	Length (cm)	Sex	Notes
JIV 543	07/19/2011	15:05	IRLO-AN-ANT1-1	1	300	28.5	F	Composite
	07/19/2011	15:05	IRLO-AN-ANT1-1	1	350	28.4	F	Composite
JIV 544	07/19/2011	14:39	IRLO-AN-ANT1-2	1	550	32.6	F	
JDR 113	07/19/2011	14:47	IRLO-AN-ANT1-3	1	1025	37.7	F	
JET 764	07/19/2011	9:40	IRLO-AN-ANT2-1	1	680	37.3	M	
JET 765	07/19/2011	9:50	IRLO-AN-ANT2-2	1	750	34.1	F	
JIV 542	07/19/2011	9:35	IRLO-AN-ANT2-3	1	450	31.3	M	Composite
	07/19/2011	9:35	IRLO-AN-ANT2-3	1	650	35.5	M	Composite
JDR 108	07/19/2011	16:00	ROCK-AN-ANT1-1	1	1350	40.9	M	
JDQ 745	07/19/2011	14:50	SEAW-AN-ANT1-1	1	---			Salinity = 35
JDQ 746	07/19/2011	14:38	SEAW-AN-ANT1-2	1	---			Salinity = 35
JDQ 747	07/19/2011	14:40	SEAW-AN-ANT1-3	1	---			Salinity = 35
JIT 793	07/19/2011	14:55	SEDI-AN-ANT1-1	1	---			
JDR 104	07/19/2011	14:55	URCH-AN-ANT1-1	9	780			
JDR 098	07/20/2011	10:00	CHIT-AN-ANT1-1	3	685			
JDQ 876	07/20/2011	11:06	FUCU-AN-ANT1-2	1	5200			
JDQ 877	07/20/2011	11:20	FUCU-AN-ANT1-3	1	5250			
JDR 101	07/20/2011	10:10	HMUS-AN-ANT1-1	7	555			

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Appendix C

Chain of Custody

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University of Miami Tritium Laboratory

COC: 11023622.1.1

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023622

Sampler(s):

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: WA - Water

Laboratory: University of Miami Tritium Laboratory
Address: 4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: 305.421.4000

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 771	06/24/2011	21:30	AMC01	SEAW-CN-C2M-1CAN-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 772	06/24/2011	21:45	AMC01	SEAW-CN-C2M-1CAN-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 775	06/24/2011	22:30	AMC01	SEAW-CN-C2M-1E-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 776	06/24/2011	22:37	AMC01	SEAW-CN-C2M-1E-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 789	06/24/2011	22:55	AMC01	SEAW-CN-C2M-2D-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 790	06/24/2011	23:07	AMC01	SEAW-CN-C2M-2D-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 791	06/24/2011	16:03	AMC01	SEAW-CN-C2M-2E-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 792	06/24/2011	16:18	AMC01	SEAW-CN-C2M-2E-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 793	06/24/2011	15:40	AMC01	SEAW-CN-C2M-2F-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 794	06/24/2011	15:50	AMC01	SEAW-CN-C2M-2F-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 799	06/24/2011	19:50	AMC01	SEAW-CN-C2M-3B-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 800	06/24/2011	19:55	AMC01	SEAW-CN-C2M-3B-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 801	06/24/2011	17:35	AMC01	SEAW-CN-C2M-3C-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 802	06/24/2011	17:45	AMC01	SEAW-CN-C2M-3C-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 803	06/24/2011	16:40	AMC01	SEAW-CN-C2M-3CAN-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 804	06/24/2011	16:54	AMC01	SEAW-CN-C2M-3CAN-D	HDPE 1 L	1	None	WA			N		Enrich H-3

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren L Goodknight	9/26/11	11:15						
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
Charlene Quell	6-28-11	11:30						

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COC: 11023622.1.2

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023622

Sampler(s):

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: WA - Water

Laboratory: University of Miami Tritium Laboratory
Address: 4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: 305.421.4000

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 805	06/24/2011	15:00	AMC01	SEAW-CN-C2M-3D-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 806	06/24/2011	15:20	AMC01	SEAW-CN-C2M-3D-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 807	06/24/2011	20:10	AMC01	SEAW-CN-C2M-4A-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 808	06/24/2011	20:20	AMC01	SEAW-CN-C2M-4A-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 809	06/24/2011	18:05	AMC01	SEAW-CN-C2M-4B-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 810	06/24/2011	19:15	AMC01	SEAW-CN-C2M-4B-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 811	06/24/2011	17:10	AMC01	SEAW-CN-C2M-5A-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 812	06/24/2011	17:20	AMC01	SEAW-CN-C2M-5A-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 813	06/24/2011	22:05	AMC01	SEAW-CN-C2M-C1-2-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 814	06/24/2011	22:12	AMC01	SEAW-CN-C2M-C1-2-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 815	06/24/2011	20:40	AMC01	SEAW-CN-C2M-C3-4-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 816	06/24/2011	20:45	AMC01	SEAW-CN-C2M-C3-4-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 819	06/24/2011	21:05	AMC01	SEAW-CN-C2M-C4-4-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 820	06/24/2011	21:15	AMC01	SEAW-CN-C2M-C4-4-D	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 823	06/24/2011	23:39	AMC01	SEAW-CN-C2M-LS2-2-S	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 824	06/24/2011	23:45	AMC01	SEAW-CN-C2M-LS2-2-D	HDPE 1 L	1	None	WA			N		Enrich H-3

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren L Goodknight	9/26/11	11:15						
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
Charlene Quell	6/28/11	11:30						

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University of Miami Tritium Laboratory

COC: 11023622.1.3

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023622

Sampler(s):

Project: Amchitka
Purchase Order:

Cost Number: 1-502-1-07-611-4-02

Turnaround (Days): 28

Matrix: WA - Water

Laboratory: University of Miami Tritium Laboratory
Address: 4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: 305.421.4000

Grp #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
	JDQ 825	06/24/2011	21:35	AMC01	SEAW-CN-C2M-VESDUP-1	HDPE 1 L	1	None	WA			N		Enrich H-3
	JDQ 826	06/24/2011	21:50	AMC01	SEAW-CN-C2M-VESDUP-2	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JET 736	06/22/2011	10:45	AMC01	LAKE-AI-LT1-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JET 737	06/21/2011	10:45	AMC01	LAKE-AI-LT1-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JET 738	06/24/2011	9:54	AMC01	LAKE-AI-CN-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JET 739	06/24/2011	9:54	AMC01	LAKE-AI-CN-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	6/28/11	11:45						
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
Charlene Quill	6-28-11	11:30						

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COC: 11023622.1.1

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023622

Sampler(s):

1-16

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: WA - Water

Laboratory: University of Miami Tritium Laboratory
Address: 4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: 305.421.4000

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 700	07/08/2011	10:40	AMC05	SEAW-CN-CT1-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 701	07/08/2011	10:28	AMC05	SEAW-CN-CT1-2	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 702	07/08/2011	10:37	AMC05	SEAW-CN-CT1-3	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 703	07/06/2011	14:30	AMC05	SEAW-CN-CT2-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 704	07/07/2011	10:15	AMC05	SEAW-CN-CT2-2	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 705	07/07/2011	10:20	AMC05	SEAW-CN-CT2-3	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 706	07/05/2011	15:30	AMC05	SEAW-CN-CT3-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 707	07/05/2011	15:20	AMC05	SEAW-CN-CT3-2	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 708	07/06/2011	9:40	AMC05	SEAW-CN-CT3-3	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 724	07/06/2011	9:45	AMC05	SEAW-CN-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 725	07/04/2011	15:00	AMC02	SEAW-LS-LT1-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 726	07/04/2011	14:45	AMC02	SEAW-LS-LT1-2	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 727	07/~~04~~ 05/2011	9:56	AMC02	SEAW-LS-LT1-3	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 728	07/03/2011	15:30	AMC02	SEAW-LS-LT2-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 729	07/03/2011	15:20	AMC02	SEAW-LS-LT2-2	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 730	07/03/2011	15:40	AMC02	SEAW-LS-LT2-3	HDPE 1 L	1	None	WA			N		Enrich H-3

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1430						
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
Charlene Grall	7/25/11	10:55						

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COC: 11023622.1.2

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023622

Sampler(s):

17-32

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: WA - Water

Laboratory: University of Miami Tritium Laboratory
Address: 4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: 305.421.4000

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 731	07/03/2011	10:40	AMC02	SEAW-LS-LT3-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 732	07/03/2011	11:00	AMC02	SEAW-LS-LT3-2	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 733	07/03/2011	11:20	AMC02	SEAW-LS-LT3-3	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 734	07/12/2011	15:00	AMC02	SEAW-LS-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 735	07/09/2011	12:55	AMC03	SEAW-ML-MT1-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 736	07/09/2011	12:47	AMC03	SEAW-ML-MT1-2	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 737	07/09/2011	13:00	AMC03	SEAW-ML-MT1-3	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 738	07/10/2011	17:00	AMC03	SEAW-ML-MT2-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 739	07/10/2011	17:05	AMC03	SEAW-ML-MT2-2	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 740	07/10/2011	17:05	AMC03	SEAW-ML-MT2-3	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 741	07/10/2011	10:50	AMC03	SEAW-ML-MT3-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 742	07/10/2011	11:00	AMC03	SEAW-ML-MT3-2	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 743	07/10/2011	11:10	AMC03	SEAW-ML-MT3-3	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 744	07/09/2011	13:05	AMC03	SEAW-ML-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 745	07/19/2011	14:50	AMC01	SEAW-AN-ANT1-1	HDPE 1 L	1	None	WA			N		Enrich H-3
1	JDQ 746	07/19/2011	1420 ~~14:55~~	AMC01	SEAW-AN-ANT1-2	HDPE 1 L	1	None	WA			N		Enrich H-3

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1430						
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
Charlene Grall	7/25/11	10:55						

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University of Miami Tritium Laboratory

COC: 11023622.1.3

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023622

Sampler(s):

33-48

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: WA - Water

Laboratory: University of Miami Tritium Laboratory
Address: 4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: 305.421.4000

	Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
34	1	JDQ 747	07/19/2011	1433 ~~1440~~	AMC01	SEAW-AN-ANT1-3	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 748	07/18/2011	15:25	AMC01	SEAW-AN-ANT2-1	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
35	1	JDQ 749	07/18/2011	15:30	AMC01	SEAW-AN-ANT2-2	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 750	07/18/2011	15:40	AMC01	SEAW-AN-ANT2-3	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 751	07/17/2011	16:35	AMC01	SEAW-AN-ANT3-1	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 752	07/17/2011	16:20	AMC01	SEAW-AN-ANT3-2	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 753	07/17/2011	16:15	AMC01	SEAW-AN-ANT3-3	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
40	1	JDQ 754	07/17/2011	16:25	AMC01	SEAW-AN-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 755	07/15/2011	10:55	AMC01	SEAW-AS-AST1-1	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 756	07/15/2011	10:51	AMC01	SEAW-AS-AST1-2	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 757	07/15/2011	10:33	AMC01	SEAW-AS-AST1-3	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 758	07/16/2011	10:00	AMC01	SEAW-AS-AST2-1	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
45	1	JDQ 759	07/16/2011	10:00	AMC01	SEAW-AS-AST2-2	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 760	07/16/2011	10:15	AMC01	SEAW-AS-AST2-3	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 761	07/14/2011	14:25	AMC01	SEAW-AS-AST3-1	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 762	07/14/2011	14:45	AMC01	SEAW-AS-AST3-2	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1450						
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
Charlene Grace	7/25/11	10:55						

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COC: 11023622.1.4

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023622

Sampler(s):

49-64

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: WA - Water

Laboratory: University of Miami Tritium Laboratory
Address: 4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: 305.421.4000

	Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
	1	JDQ 763	07/14/2011	14:30	AMC01	SEAW-AS-AST3-3	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
50	1	JDQ 764	07/14/2011	14:40	AMC01	SEAW-AS-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 765	07/08/2011	16:47	AMC01	SEAW-CN-C2M-1A-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 766	07/08/2011	16:56	AMC01	SEAW-CN-C2M-1A-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 767	07/08/2011	17:10	AMC01	SEAW-CN-C2M-1B-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 768	07/08/2011	17:20	AMC01	SEAW-CN-C2M-1B-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
55	1	JDQ 769	07/06/2011	15:28	AMC01	SEAW-CN-C2M-1C-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 770	07/06/2011	15:35	AMC01	SEAW-CN-C2M-1C-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 773	07/03/2011	17:53	AMC01	SEAW-CN-C2M-1D-S ✓	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 774	07/03/2011	17:54	AMC01	SEAW-CN-C2M-1D-D ✓	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 777	07/03/2011	18:39	AMC01	SEAW-CN-C2M-1F-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
60	1	JDQ 778	07/03/2011	18:47	AMC01	SEAW-CN-C2M-1F-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 779	07/03/2011	19:03	AMC01	SEAW-CN-C2M-1SB-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 780	07/03/2011	18:59	AMC01	SEAW-CN-C2M-1SB-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 781	07/06/2011	14:25	AMC01	SEAW-CN-C2M-2A-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
64	1	JDQ 782	07/06/2011	14:35	AMC01	SEAW-CN-C2M-2A-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1450						
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
Charlene Grace	7/25/11	10:55						

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COC: 11023622.1.5

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023622

Sampler(s):

65-80

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: WA - Water

Laboratory: University of Miami Tritium Laboratory
Address: 4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: 305.421.4000

	Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
	1	JDQ 783	07/06/2011	14:43	AMC01	SEAW-CN-C2M-2B-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
66	1	JDQ 784	07/06/2011	14:57	AMC01	SEAW-CN-C2M-2B-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 785	07/06/2011	13:51	AMC01	SEAW-CN-C2M-2C-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 786	07/06/2011	14:00	AMC01	SEAW-CN-C2M-2C-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 787	07/06/2011	13:10	AMC01	SEAW-CN-C2M-2CAN-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
70	1	JDQ 788	07/06/2011	13:20	AMC01	SEAW-CN-C2M-2CAN-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 795	07/03/2011	19:11	AMC01	SEAW-CN-C2M-2SB-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 796	07/03/2011	19:16	AMC01	SEAW-CN-C2M-2SB-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 797	07/06/2011	14:10	AMC01	SEAW-CN-C2M-3A-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
75	1	JDQ 798	07/06/2011	14:18	AMC01	SEAW-CN-C2M-3A-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
75	1	JDQ 817	07/06/2011	13:30	AMC01	SEAW-CN-C2M-C4-1-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 818	07/06/2011	13:40	AMC01	SEAW-CN-C2M-C4-1-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 821	07/06/2011	15:14	AMC01	SEAW-CN-C2M-C5-1-S	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 822	07/06/2011	15:20	AMC01	SEAW-CN-C2M-C5-1-D	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
	1	JDQ 827	07/03/2011	19:13	AMC01	SEAW-CN-C2M-1SB-D-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
80	1	JDQ 828	07/03/2011	19:08	AMC01	SEAW-CN-C2M-1SB-S-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1450						
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
Charlene Grace	7/25/11	10:55						

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COC: 11023622.1.6

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023622

Sampler(s):

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: WA - Water

Laboratory: University of Miami Tritium Laboratory
Address: 4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: 305.421.4000

	Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
81	1	JDQ 829	07/06/2011	14:50	AMC01	SEAW-CN-C2M-2B-S-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓
82	1	JDQ 830	07/06/2011	15:05	AMC01	SEAW-CN-C2M-2B-D-DUP	HDPE 1 L	1	None	WA			N		Enrich H-3 ✓

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1450						
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
Charlene Grace	7/25/11	10:55						

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Lawrence Livermore National Laboratory

COC: 11023623.1.1

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023623

Sampler(s):

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna SO - Soil VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
7000 East Avenue; Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 845	06/23/2011	12:15	AMC05	FUCU-CN-CT1-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 846	06/23/2011	11:05	AMC05	FUCU-CN-CT1-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 847	06/23/2011	11:30	AMC05	FUCU-CN-CT1-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 854	06/23/2011	12:15	AMC05	FUCU-CN-DUP	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 855	06/22/2011	15:25	AMC05	FUCU-LS-LT1-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 856	06/22/2011	15:50	AMC05	FUCU-LS-LT1-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 857	06/22/2011	16:45	AMC05	FUCU-LS-LT1-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 858	06/22/2011	15:15	AMC05	FUCU-LS-LT2-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 859	06/22/2011	15:41	AMC05	FUCU-LS-LT2-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 860	06/22/2011	16:15	AMC05	FUCU-LS-LT2-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 864	06/22/2011	16:45	AMC05	FUCU-LS-DUP	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 865	06/20/2011	17:15	AMC05	FUCU-ML-MT1-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 866	06/21/2011	12:15	AMC05	FUCU-ML-MT1-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 868	06/20/2011	17:00	AMC05	FUCU-ML-MT2-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 869	06/21/2011	11:53	AMC05	FUCU-ML-MT2-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 870	06/21/2011	11:53	AMC05	FUCU-ML-MT2-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Laurence Smithwick	6/26/11	1245		6/22/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
	6/27/11	1200		6/27/11	1400			

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COC: 11023623.1.2

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023623

Sampler(s):

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna SO - Soil VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
7000 East Avenue; Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 874	06/20/2011	17:15	AMC05	FUCU-ML-DUP	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 895	06/21/2011	9:50	AMC05	STRL-AI-ML-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 896	06/22/2011	11:15	AMC05	STRL-AI-LT1-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 898	06/23/2011	13:45	AMC05	STRL-AI-CT1-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 901	06/21/2011	9:50	AMC05	SOIL-AI-ML-1	Plastic Bag	2	None	SO					G Spec 3 BAGS CONSTITUTE SAMPLE
1	JDQ 902	06/22/2011	11:15	AMC05	SOIL-AI-LT1-2	Plastic Bag	2	None	SO					G Spec
1	JDQ 903	06/23/2011	13:45	AMC05	SOIL-AI-CT1-3	Plastic Bag	2	None	SO					G Spec
1	JDQ 907	06/24/2011	12:00	AMC05	GWGU-AI-XXX-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 908	06/24/2011	12:00	AMC05	DOLL-AI-XXX-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 741	06/22/2011	17:20	AMC05	SEDI-LS-LT1-1	Plastic Bag	1	None	SO					G Spec,Am,Pu,Uiso
1	JET 742	06/20/2011	16:50	AMC05	SEDI-ML-MT1-1	Plastic Bag	1	None	SO					G Spec,Am,Pu,Uiso
1	JET 743	06/24/2011	11:00	AMC05	GOOS-AI-XXX-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Laurence Smithwick	6/26/11	1245		6/22/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
	6/27/11	1200		6/27/11	1400			

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Lawrence Livermore National Laboratory

COC: 11023623.1.1

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023623

Sampler(s):

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna SO - Soil VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
7000 East Avenue; Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 897	06/28/2011	16:50	AMC05	STRL-AD-XXX-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 899	06/29/2011	12:15	AMC05	STRL-AD-XXX-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 900	06/29/2011	19:25	AMC05	STRL-AD-XXX-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 904	06/28/2011	16:50	AMC05	SOIL-AD-XXX-1	Plastic Bag	1	None	SO					G Spec
1	JDQ 905	06/29/2011	16:15	AMC05	SOIL-AD-XXX-2	Plastic Bag	1	None	SO					G Spec
1	JDQ 906	06/29/2011	19:25	AMC05	SOIL-AD-XXX-3	Plastic Bag	1	None	SO					G Spec
1	JDQ 909	06/28/2011	16:50	AMC05	DOLL-AD-XXX-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	6/30/11	1400	[illegible]	7/1/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[illegible]	7/1/11	1200	[illegible]	7/1/11	1400			

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COC: 11023623.1.1

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023623

Sampler(s):

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna SO - Soil VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
7000 East Avenue; Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 848 X	07/08/2011	17:45	AMC05	FUCU-CN-CT2-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 849 X	07/08/2011	17:55	AMC05	FUCU-CN-CT2-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 850 X	07/12/2011	17:30	AMC05	FUCU-CN-CT2-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 851 X	07/08/2011	10:49	AMC05	FUCU-CN-CT3-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 852 X	07/08/2011	11:19	AMC05	FUCU-CN-CT3-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 853 X	07/08/2011	11:43	AMC05	FUCU-CN-CT3-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 861 X	07/02/2011	18:38	AMC05	FUCU-LS-LT3-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 862 X	07/02/2011	19:04	AMC05	FUCU-LS-LT3-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 863 X	07/02/2011	19:04	AMC05	FUCU-LS-LT3-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 867 X	07/09/2011	14:35	AMC05	FUCU-ML-MT1-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 871 X	07/10/2011	15:00	AMC05	FUCU-ML-MT3-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 872 X	07/10/2011	15:10	AMC05	FUCU-ML-MT3-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 873 X	07/10/2011	15:20	AMC05	FUCU-ML-MT3-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 875 X	07/19/2011	13:09	AMC05	FUCU-AN-ANT1-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 876 X	07/20/2011	11:06	AMC05	FUCU-AN-ANT1-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 877 X	07/20/2011	11:20	AMC05	FUCU-AN-ANT1-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1145	[illegible]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[illegible]	7/28/11	1200	[illegible]	7/28/11	1400			

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Lawrence Livermore National Laboratory

COC: 11023623.1.2

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023623

Sampler(s):

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna SO - Soil VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
7000 East Avenue; Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 878 X	07/18/2011	14:11	AMC05	FUCU-AN-ANT2-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 879 X	07/18/2011	16:57	AMC05	FUCU-AN-ANT2-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 880 X	07/18/2011	17:35	AMC05	FUCU-AN-ANT2-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 881 X	07/18/2011	9:02	AMC05	FUCU-AN-ANT3-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 882 X	07/18/2011	13:00	AMC05	FUCU-AN-ANT3-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 883 X	07/18/2011	13:35	AMC05	FUCU-AN-ANT3-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 884 X	07/18/2011	13:00	AMC05	FUCU-AN-DUP	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 885 X	07/16/2011	11:37	AMC05	FUCU-AS-AST1-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 886 X	07/16/2011	11:48	AMC05	FUCU-AS-AST1-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 887 X	07/16/2011	12:10	AMC05	FUCU-AS-AST1-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 888 X	07/16/2011	15:45	AMC05	FUCU-AS-AST2-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 889 X	07/16/2011	16:15	AMC05	FUCU-AS-AST2-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 890 X	07/16/2011	16:44	AMC05	FUCU-AS-AST2-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 891 X	07/14/2011	16:15	AMC05	FUCU-AS-AST3-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 892 X	07/14/2011	16:20	AMC05	FUCU-AS-AST3-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 893 X	07/14/2011	16:25	AMC05	FUCU-AS-AST3-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Laura Knightknight	7/21/11	1445	[signature]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[signature]	7/28/11	1200	[signature]	7/28/11	1400			

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COC: 11023623.1.3

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023623

Sampler(s):

Project: Amchitka
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna SO - Soil VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
7000 East Avenue; Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
Kob 1	JDQ 894 X	07/18/2011	1222	AMC05	FUCU-AS-DUP	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Laura Knightknight	7/21/11	1445	[signature]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[signature]	7/28/11	1200	[signature]	7/28/11	1400			

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Lawrence Livermore National Laboratory

COC: 11023624.1.1

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023624

Sampler(s):

Project: Amchitka, Cannikin
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 718 X	07/08/2011	10:30	AMC05	EUAL-CN-CT1-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 960 X	07/08/2011	10:50	AMC05	EUAL-CN-CT1-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 961 X	07/08/2011	10:50	AMC05	EUAL-CN-CT1-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 962 X	07/08/2011	16:15	AMC05	EUAL-CN-CT2-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 963 X	07/08/2011	16:25	AMC05	EUAL-CN-CT2-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 964 X	07/07/2011	10:45	AMC05	EUAL-CN-CT2-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 965 X	07/05/2011	15:15	AMC05	EUAL-CN-CT3-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 966 X	07/05/2011	15:40	AMC05	EUAL-CN-CT3-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 967 X	07/05/2011	15:30	AMC05	EUAL-CN-CT3-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 968 X	07/08/2011	9:35	AMC05	EUAL-CN-DUP	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDQ 969 X	07/08/2011	10:50	AMC05	CHIT-CN-CT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 970 X	07/07/2011	15:00	AMC05	CHIT-CN-CT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 971 X	07/05/2011	15:40	AMC05	CHIT-CN-CT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 972 X	07/08/2011	10:37	AMC05	HMUS-CN-CT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 973 X	07/07/2011	15:00	AMC05	HMUS-CN-CT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 974 X	07/05/2011	16:10	AMC05	HMUS-CN-CT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Laura Goodwright	7/21/11	1445	[signature]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[signature]	7/28/11	1200	[signature]	7/28/11	1400			

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COC: 11023624.1.2

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023624

Sampler(s):

Project: Amchitka, Cannikin
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDQ 975 X	07/08/2011	10:40	AMC05	URCH-CN-CT1-1	68 oz WM HDPE	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 976 X	07/07/2011	10:27	AMC05	URCH-CN-CT2-1	68 oz WM HDPE	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 977 X	07/05/2011	16:00	AMC05	URCH-CN-CT3-1	68 oz WM HDPE	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 978 X	07/08/2011	17:00	AMC05	OCTP-CN-C2M-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso 2 PACKAGES FOR SAMPLE (1 of 2 of 2)
1	JDQ 979 X	07/08/2011	14:30	AMC05	ROCK-CN-CT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 980 X	07/08/2011	14:45	AMC05	ROCK-CN-CT1-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 981 X	07/08/2011	15:00	AMC05	ROCK-CN-CT1-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 982 X	07/08/2011	14:30	AMC05	ROCK-CN-CT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 983 X	07/08/2011	15:00	AMC05	ROCK-CN-CT2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 984 X	07/08/2011	15:15	AMC05	ROCK-CN-CT2-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 985 X	07/08/2011	9:50	AMC05	ROCK-CN-CT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 986 X	07/08/2011	9:55	AMC05	ROCK-CN-CT3-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 987 X	07/08/2011	10:10	AMC05	ROCK-CN-CT3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 988 X	07/08/2011	10:20	AMC05	ROCK-CN-DUP	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 989 X	07/08/2011	10:50	AMC05	GREN-CN-CT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDQ 990 X	07/08/2011	10:25	AMC05	GREN-CN-CT1-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Laura Goodwright	7/21/11	1445	[signature]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[signature]	7/28/11	1200	[signature]	7/28/11	1400			

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Lawrence Livermore National Laboratory

COC: 11023624.1.3

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023624

Sampler(s):

Project: Amchitka, Cannikin
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis	
1	JDQ 991 X	07/08/2011	10:30	AMC05	GREN-CN-CT1-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JDQ 992 X	07/07/2011	14:40	AMC05	GREN-CN-CT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JDQ 993 X	07/07/2011	14:50	AMC05	GREN-CN-CT2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JDQ 994 X	07/07/2011	14:55	AMC05	GREN-CN-CT2-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JDQ 995 X	07/05/2011	15:30	AMC05	GREN-CN-CT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JDQ 996 X	07/05/2011	15:45	AMC05	GREN-CN-CT3-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JDQ 997 X	07/05/2011	16:00	AMC05	GREN-CN-CT3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JDQ 998 X	07/08/2011	14:25	AMC05	GREN-CN-DUP	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JDQ 999 X	07/05/2011	16:10	AMC05	IRLO-CN-CT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JDR 000 X	07/13/2011	8:30	AMC05	HALI-CN-C2M-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JDR 001 X	07/08/2011	14:55	AMC05	PCOD-CN-C2M-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	1 bag with 2 fish bagged ins
1	JET 746 X	07/05/2011	15:30	AMC05	IRLO-CN-CT3-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JET 747 X	07/07/2011	14:45	AMC05	IRLO-CN-CT2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JET 748 X	07/07/2011	10:40	AMC05	IRLO-CN-CT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JET 749 X	07/05/2011	15:40	AMC05	IRLO-CN-CT3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	
1	JET 750 X	07/07/2011	14:55	AMC05	IRLO-CN-CT2-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso	

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodenright	7/21/11	1445		7/22/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
	7/22/11	1200		7/22/11	1400			

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COC: 11023625.1.1

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023625

Sampler(s):

Project: Amchitka, Long Shot
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 002 X	07/04/2011	14:45	AMC02	EUAL-LS-LT1-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 003 X	07/04/2011	14:55	AMC02	EUAL-LS-LT1-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 004 X	07/04/2011	15:10	AMC02	EUAL-LS-LT1-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 005 X	07/03/2011	15:00	AMC02	EUAL-LS-LT2-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 006 X	07/03/2011	15:35	AMC02	EUAL-LS-LT2-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 007 X	07/03/2011	15:10	AMC02	EUAL-LS-LT2-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 008 X	07/02/2011	18:40	AMC02	EUAL-LS-LT3-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 009 X	07/02/2011	18:10	AMC02	EUAL-LS-LT3-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 010 X	07/02/2011	18:30	AMC02	EUAL-LS-LT3-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 011 X	07/03/2011	15:00	AMC02	EUAL-LS-DUP	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 012 X	07/04/2011	15:05	AMC02	CHIT-LS-LT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 013 X	07/03/2011	14:50	AMC05	CHIT-LS-LT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 014 X	07/03/2011	10:00	AMC02	CHIT-LS-LT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 015 X	07/05/2011	9:57	AMC02	HMUS-LS-LT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 016 X	07/04/2011	9:30	AMC02	HMUS-LS-LT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 017 X	07/03/2011	11:00 Void	AMC02	HMUS-LS-LT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodenright	7/21/11	1450		7/22/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
	7/22/11	1200		7/22/11	1400			

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Lawrence Livermore National Laboratory

COC: 11023625.1.2

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023625

Sampler(s):

Project: Amchitka, Long Shot
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 018 X	07/04/2011	15:02	AMC02	URCH-LS-LT1-1	68 oz HDPE WM	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 019 X	07/03/2011	16:00	AMC02	URCH-LS-LT2-1	68 oz HDPE WM	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 020 X	07/02/2011	18:10	AMC02	URCH-LS-LT3-1	68 oz HDPE WM	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 021 X	07/03/2011	15:25	AMC02	OCTP-LS-L2M-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 022 X	07/04/2011	15:00	AMC02	ROCK-LS-LT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 023 X	07/12/2011	16:05	AMC02	ROCK-LS-LT1-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 024 X	07/12/2011	16:30	AMC02	ROCK-LS-LT1-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 025 X	07/04/2011	9:30	AMC02	ROCK-LS-LT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 026 X	07/12/2011	15:10	AMC02	ROCK-LS-LT2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 027 X	07/12/2011	16:30	AMC02	ROCK-LS-DUP2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 028 X	07/02/2011	17:30	AMC02	ROCK-LS-LT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 029 X	07/12/2011	13:12	AMC02	ROCK-LS-LT3-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 030 X	07/03/2011	11:45	AMC02	ROCK-LS-LT3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 031 X	07/12/2011	13:17	AMC02	ROCK-LS-DUP	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 032 X	07/04/2011	15:10	AMC02	GREN-LS-LT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 033 X	07/04/2011	15:30	AMC02	GREN-LS-LT1-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1450	[illegible]	7/28/11	1900			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[illegible]	7/28/11	1200	[illegible]	7/28/11	1400			

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COC: 11023625.1.3

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023625

Sampler(s):

Project: Amchitka, Long Shot
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 034 X	07/05/2011	10:12	AMC02	GREN-LS-LT1-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 035 X	07/03/2011	12:20	AMC02	IRLO-LS-LT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 036 X	07/03/2011	13:45	AMC02	IRLO-LS-LT2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 037 X	07/03/2011	13:50	AMC01	IRLO-LS-LT2-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 038 X	07/03/2011	11:30	AMC02	GREN-LS-LT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 039 X	07/04/2011	14:45	AMC02	IRLO-LS-LT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 040 X	07/04/2011	14:55	AMC02	IRLO-LS-LT1-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 041 X	07/05/2011	10:15	AMC02	IRLO-LS-LT1-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 042 X	07/12/2011	12:10	AMC02	IRLO-LS-LT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 043 X	07/13/2011	9:29	AMC02	HALI-LS-L2M-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 044 X	07/04/2011	9:30	AMC02	PCOD-LS-L2M-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 751 X	D3 07/04/2011	12:15	AMC02	GREN-LS-LT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 752 X	07/03/2011	14:20	AMC02	GREN-LS-LT2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 753 X	07/03/2011	15:10	AMC02	GREN-LS-LT2-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 754 X	07/12/2011	13:10	AMC02	ROCK-LS-LT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 755 X	07/12/2011	12:15	AMC02	IRLO-LS-LT3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1450	[illegible]	7/28/11	1900			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[illegible]	7/28/11	1200	[illegible]	7/28/11	1400			

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Lawrence Livermore National Laboratory

COC: 11023626.1.1

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023626

Sampler(s):

Project: Amchitka, Milrow
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 045 X	07/09/2011	13:05	AMC03	EUAL-ML-MT1-1	Plastic Bag	1	None	VG			N		G Spec,Am,Pu,Uiso
1	JDR 046 X	07/09/2011	13:15	AMC03	EUAL-ML-MT1-2	Plastic Bag	1	None	VG			N		G Spec,Am,Pu,Uiso
1	JDR 047 X	07/09/2011	13:10	AMC03	EUAL-ML-MT1-3	Plastic Bag	1	None	VG			N		G Spec,Am,Pu,Uiso
1	JDR 048 X	07/10/2011	17:00	AMC03	EUAL-ML-MT2-1	Plastic Bag	1	None	VG			N		G Spec,Am,Pu,Uiso
1	JDR 049 X	07/10/2011	17:00	AMC03	EUAL-ML-MT2-2	Plastic Bag	1	None	VG			N		G Spec,Am,Pu,Uiso
1	JDR 050 X	07/10/2011	17:30	AMC03	EUAL-ML-MT2-3	Plastic Bag	1	None	VG			N		G Spec,Am,Pu,Uiso
1	JDR 051 X	07/10/2011	10:40	AMC03	EUAL-ML-MT3-1	Plastic Bag	1	None	VG			N		G Spec,Am,Pu,Uiso
1	JDR 052 X	07/10/2011	10:55	AMC03	EUAL-ML-MT3-2	Plastic Bag	1	None	VG			N		G Spec,Am,Pu,Uiso
1	JDR 053 X	07/10/2011	10:30	AMC03	EUAL-ML-MT3-3	Plastic Bag	1	None	VG			N		G Spec,Am,Pu,Uiso
1	JDR 054 X	07/09/2011	16:45	AMC03	EUAL-ML-DUP	Plastic Bag	1	None	VG			N		G Spec,Am,Pu,Uiso
1	JDR 055 X	07/09/2011	13:15	AMC03	CHIT-ML-MT1-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 056 X	07/10/2011	17:15	AMC03	CHIT-ML-MT2-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 057 X	07/10/2011	10:50	AMC03	CHIT-ML-MT3-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 058 X	07/09/2011	17:40	AMC03	HMUS-ML-MT1-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 059 X	07/11/2011	11:30	AMC03	HMUS-ML-MT2-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 060 X	07/10/2011	11:10	AMC03	HMUS-ML-MT3-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Hodknight	7/21/11	1450	[signature]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[signature]	7/28/11	1200	[signature]	7/28/11	1400			

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COC: 11023626.1.2

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023626

Sampler(s):

Project: Amchitka, Milrow
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 061 X	07/09/2011	13:10	AMC03	URCH-ML-MT1-1	68 oz WM HDPE	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 062 X	07/10/2011	17:20	AMC03	URCH-ML-MT2-1	68 oz WM HDPE	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 063 X	07/10/2011	11:20	AMC03	URCH-ML-MT3-1	68 oz WM HDPE	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 064 X	07/10/2011	17:00	AMC03	OCTP-ML-M2M-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 065 X	07/09/2011	12:20	AMC03	ROCK-ML-MT1-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 066 X	07/09/2011	13:15	AMC03	ROCK-ML-MT1-2	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 067 X	07/09/2011	15:00	AMC03	ROCK-ML-MT1-3	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 068 X	07/11/2011	10:00	AMC03	IRLO-ML-MT2-2	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 069 X	07/11/2011	10:20	AMC03	IRLO-ML-MT2-3	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 070 X	07/11/2011	14:00	AMC03	ROCK-ML-MT2-3	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 071 X	07/10/2011	10:15	AMC03	ROCK-ML-MT3-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 072 X	07/10/2011	14:30	AMC03	ROCK-ML-MT3-2	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 073 X	07/10/2011	14:25	AMC03	ROCK-ML-MT3-3	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 075 X	07/09/2011	15:10	AMC03	GREN-ML-MT1-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 076 X	07/09/2011	13:05	AMC03	GREN-ML-MT1-2	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JDR 077 X	07/09/2011	15:40	AMC03	GREN-ML-MT1-3	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Hodknight	7/21/11	1450	[signature]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[signature]	7/28/11	1200	[signature]	7/28/11	1400			

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Lawrence Livermore National Laboratory

COC: 11023626.1.3

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023626

Sampler(s):

Project: Amchitka, Milrow
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis	
1	JDR 078 X	07/11/2011	11:10	AMC03	GREN-ML-MT2-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JDR 079 X	07/11/2011	10:35	AMC03	GREN-ML-MT2-2	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JDR 080 X	07/11/2011	10:40	AMC03	GREN-ML-MT2-3	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JDR 081 X	07/10/2011	12:10	AMC03	GREN-ML-MT3-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JDR 082 X	07/10/2011	11:55	AMC03	GREN-ML-MT3-2	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JDR 083 X	07/10/2011	12:10	AMC03	GREN-ML-MT3-3	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JDR 084 X	07/10/2011	12:30	AMC03	GREN-ML-DUP	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JDR 085 X	07/09/2011	13:10	AMC03	IRLO-ML-MT1-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JDR 086 X	07/11/2011	15:30	AMC03	HALI-ML-M2M-1	Plastic Bag	2	None	FA			N		G Spec,Am,Pu,Uiso	2 packages for sample
1	JDR 087 X	07/10/2011	16:30	AMC03	PCOD-ML-M2M-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	4 fish constitute sample
1	JET 757 X	07/09/2011	13:00	AMC03	IRLO-ML-MT1-2	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JET 758 X	07/09/2011	12:30	AMC03	IRLO-ML-MT1-3	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JET 759 X	07/09/2011	16:00	AMC03	ROCK-ML-DUP	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JET 760 X	07/10/2011	11:00	AMC03	IRLO-ML-MT3-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JIV 539 X	07/10/2011	10:30	AMC03	IRLO-ML-MT3-2	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	
1	JIV 540 X	07/10/2011	11:00	AMC03	IRLO-ML-MT3-3	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso	

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1450	[illegible]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[illegible]	7/28/11	1200	[illegible]	7/28/11	[illegible]			

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COC: 11023626.1.4

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023626

Sampler(s):

Project: Amchitka, Milrow
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JIV 541 X	07/10/2011	17:15	AMC03	IRLO-ML-MT2-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JIV 555 X	07/11/2011	13:30	AMC03	ROCK-ML-MT2-1	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso
1	JIV 556 X	07/11/2011	13:45	AMC03	ROCK-ML-MT2-2	Plastic Bag	1	None	FA			N		G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1450	[illegible]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[illegible]	7/28/11	1200	[illegible]	7/28/11	[illegible]			

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Lawrence Livermore National Laboratory

COC: 11023627.1.1

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023627

Sampler(s):

Project: Adak North
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 088 X	07/19/2011	14:55	AMC01	EUAL-AN-ANT1-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 089 X	07/19/2011	14:50	AMC01	EUAL-AN-ANT1-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 090 X	07/19/2011	14:40	AMC01	EUAL-AN-ANT1-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 091 X	07/18/2011	16:15	AMC01	EUAL-AN-ANT2-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 092 X	07/18/2011	16:00	AMC01	EUAL-AN-ANT2-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 093 X	07/18/2011	15:30	AMC01	EUAL-AN-ANT2-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 094 X	07/17/2011	16:30	AMC01	EUAL-AN-ANT3-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 095 X	07/17/2011	16:25	AMC01	EUAL-AN-ANT3-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 096 X	07/17/2011	16:15	AMC01	EUAL-AN-ANT3-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 097 X	07/17/2011	16:25	AMC01	EUAL-AN-DUP	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 098 X	07/20/2011	10:00	AMC01	CHIT-AN-ANT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 099 X	07/18/2011	15:40	AMC01	CHIT-AN-ANT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 100 X	07/17/2011	16:30	AMC01	CHIT-AN-ANT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 101 X	07/20/2011	10:10	AMC01	HMUS-AN-ANT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 102 X	07/18/2011	16:00	AMC01	HMUS-AN-ANT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 103 X	07/18/2011	10:30	AMC01	HMUS-AN-ANT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1440	[illegible]	7/22/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[illegible]	7/22/11	1200	[illegible]	7/22/11	1400			

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COC: 11023627.1.2

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023627

Sampler(s):

Project: Adak North
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 104 X	07/19/2011	14:55	AMC01	URCH-AN-ANT1-1	68 OZ WM HDPE	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 105 X	07/18/2011	15:50	AMC01	URCH-AN-ANT2-1	68 OZ WM HDPE	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 106 X	07/17/2011	16:40	AMC01	URCH-AN-ANT3-1	68 OZ WM HDPE	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 107 X	07/18/2011	16:00	AMC01	OCTP-AN-AN2M-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 108 X	07/19/2011	16:00	AMC01	ROCK-AN-ANT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 111 X	07/18/2011	16:00	AMC01	ROCK-AN-ANT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 112 X	07/19/2011	16:10	AMC01	ROCK-AN-ANT2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 113 X	07/19/2011	14:47	AMC01	IRLO-AN-ANT1-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 114 X	07/17/2011	16:25	AMC01	ROCK-AN-ANT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 115 X	07/17/2011	16:10	AMC01	ROCK-AN-ANT3-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 116 X	07/17/2011	16:20	AMC01	ROCK-AN-ANT3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 118 X	07/19/2011	14:38	AMC01	GREN-AN-ANT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 119 X	07/19/2011	14:45	AMC01	GREN-AN-ANT1-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 120 X	07/19/2011	14:55	AMC01	GREN-AN-ANT1-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 121 X	07/18/2011	15:40	AMC01	GREN-AN-ANT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 122 X	07/18/2011	15:40	AMC01	GREN-AN-ANT2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1440	[illegible]	7/22/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[illegible]	7/22/11	1200	[illegible]	7/22/11	1400			

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Lawrence Livermore National Laboratory

COC: 11023627.1.3

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023627

Sampler(s):

Project: Adak North
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
700 East Avenue, Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 123 X	07/18/2011	15:43	AMC01	GREN-AN-ANT2-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 124 X	07/17/2011	16:15	AMC01	GREN-AN-ANT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 125 X	07/17/2011	16:40	AMC01	GREN-AN-ANT3-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 126 X	07/17/2011	16:10	AMC01	GREN-AN-ANT3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 127 X	07/17/2011	16:10	AMC01	GREN-AN-DUP	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 128 X	07/17/2011	16:40	AMC01	IRLO-AN-ANT3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 129 X	07/17/2011	14:30	AMC01	HALI-AN-AN2M-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 130 X	07/17/2011	15:30	AMC01	PCOD-AN-AN2M-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 761 X	07/17/2011	14:20	AMC01	HALI-AN-DUP	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 762 X	07/17/2011	16:10	AMC01	IRLO-AN-ANT3-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 763 X	07/17/2011	16:45	AMC01	IRLO-AN-ANT3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 764 X	07/19/2011	9:40	AMC01	IRLO-AN-ANT2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 765 X	07/19/2011	9:50	AMC01	IRLO-AN-ANT2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JIV 542 X	07/19/2011	9:15	AMC01	IRLO-AN-ANT2-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JIV 543 X	07/19/2011	15:05	AMC01	IRLO-AN-ANT1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JIV 544 X	07/19/2011	14:39	AMC01	IRLO-AN-ANT1-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1440	[signature]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[signature]	7/28/11	1200	[signature]	7/28/11	1400			

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COC: 11023628.1.1

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023628

Sampler(s):

Project: Adak South
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
7000 East Avenue; Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 131 X	07/15/2011	10:52	AMC01	EUAL-AS-AST1-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 132 X	07/15/2011	10:40	AMC01	EUAL-AS-AST1-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 133 X	07/15/2011	10:30	AMC01	EUAL-AS-AST1-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 134 X	07/16/2011	10:20	AMC01	EUAL-AS-AST2-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 135 X	07/16/2011	10:30	AMC01	EUAL-AS-AST2-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 136 X	07/16/2011	10:05	AMC01	EUAL-AS-AST2-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 137 X	07/14/2011	14:45	AMC01	EUAL-AS-AST3-1	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 138 X	07/14/2011	14:45	AMC01	EUAL-AS-AST3-2	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 139 X	07/14/2011	14:25	AMC01	EUAL-AS-AST3-3	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 140 X	07/14/2011	10:15	AMC01	EUAL-AS-DUP	Plastic Bag	1	None	VG					G Spec,Am,Pu,Uiso
1	JDR 141 X	07/15/2011	10:25	AMC01	CHIT-AS-AST1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 142 X	07/16/2011	10:20	AMC01	CHIT-AS-AST2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 143 X	07/14/2011	10:20	AMC01	CHIT-AS-AST3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 144 X	07/15/2011	10:37	AMC01	HMUS-AS-AST1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 145 X	07/16/2011	10:18	AMC01	HMUS-AS-AST2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 146 X	07/14/2011	14:40	AMC01	HMUS-AS-AST3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1440	[signature]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[signature]	7/28/11	1200	[signature]	7/28/11	[illegible]			

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Lawrence Livermore National Laboratory

COC: 11023628.1.2

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023628

Sampler(s):

Project: Adak South
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
7000 East Avenue; Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 147 X	07/15/2011	10:47	AMC01	URCH-AS-AST1-1	68 OZ WM HDPE	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 148 X	07/16/2011	10:15	AMC01	URCH-AS-AST2-1	68 OZ WM HDPE	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 149 X	07/14/2011	14:30	AMC01	URCH-AS-AST3-1	68 OZ WM HDPE	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 151 X	07/15/2011	10:45	AMC01	ROCK-AS-AST1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 152 X	07/15/2011	11:00	AMC01	ROCK-AS-AST1-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 153 X	07/15/2011	11:05	AMC01	ROCK-AS-AST1-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 154 X	07/16/2011	13:25	AMC01	ROCK-AS-AST2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 155 X	07/16/2011	13:30	AMC01	ROCK-AS-AST2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 156 X	07/16/2011	13:50	AMC01	ROCK-AS-AST2-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 157 X	07/14/2011	10:10	AMC01	ROCK-AS-AST3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 158 X	07/14/2011	10:16	AMC01	ROCK-AS-AST3-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 159 X	07/14/2011	10:29	AMC01	ROCK-AS-AST3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 160 X	07/14/2011	14:20	AMC01	ROCK-AS-DUP	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 161 X	07/15/2011	10:25	AMC01	GREN-AS-AST1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 162 X	07/15/2011	10:40	AMC01	GREN-AS-AST1-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 163 X	07/15/2011	10:47	AMC01	GREN-AS-AST1-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1440	[signature]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[signature]	7/28/11	1200	[signature]	7/28/11	1400			

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COC: 11023628.1.3

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023628

Sampler(s):

Project: Adak South
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
7000 East Avenue; Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JDR 164 X	07/16/2011	10:12	AMC01	GREN-AS-AST2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 165 X	07/16/2011	9:55	AMC01	GREN-AS-AST2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 166 X	07/16/2011	10:12	AMC01	GREN-AS-AST2-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 167 X	07/14/2011	10:10	AMC01	GREN-AS-AST3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso 2 FISH
1	JDR 168 X	07/14/2011	10:20	AMC01	GREN-AS-AST3-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 169 X	07/14/2011	14:20	AMC01	GREN-AS-AST3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 170 X	07/14/2011	14:30	AMC01	GREN-AS-DUP	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 171 X	07/14/2011	14:45	AMC01	IRLO-AS-AST3-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JDR 173 X	07/15/2011	14:50	AMC01	PCOD-AS-AS2M-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 766 X	07/14/2011	14:25	AMC01	IRLO-AS-AST3-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 767 X	07/14/2011	14:30	AMC01	IRLO-AS-AST3-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 768 X	07/15/2011	10:40	AMC01	IRLO-AS-AST1-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 769 X	07/15/2011	10:50	AMC01	IRLO-AS-AST1-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JET 770 X	07/15/2011	11:20	AMC01	IRLO-AS-AST1-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JIV 545 X	07/16/2011	14:40	AMC01	IRLO-AS-AST2-1	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso
1	JIV 546 X	07/16/2011	14:45	AMC01	IRLO-AS-AST2-2	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodknight	7/21/11	1440	[signature]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[signature]	7/28/11	1200	[signature]	7/28/11	1400			

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Lawrence Livermore National Laboratory

COC: 11023628.1.4

Stoller
Legacy Management Team

Chain of Custody / Sample Submittal Form

RIN: 11023628

Sampler(s):

Project: Adak South
Purchase Order:
Cost Number: 1-502-1-07-611-4-02
Turnaround (Days): 28
Matrix: FA - Fauna VG - Vegetation

Laboratory: Lawrence Livermore National Laboratory
Address: Mr. Michael Tamblin
7000 East Avenue; Livermore, CA 84550
Phone: 925-424-2619

Ship #	Ticket	Sample Date	Time	Site	Location	Container	# Cont.	Preservation	Matrix	Comp.	Grab	Filtered	QC	Analysis
1	JIV 547 X	07/16/2011	18:10	AMC01	IRLO-AS-AST2-3	Plastic Bag	1	None	FA					G Spec,Am,Pu,Uiso

Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time	Relinquished by (signature)	Date	Time
Lauren Goodwright	7/21/11	1440	[illegible]	7/28/11	1400			
Received by (signature)	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**	**Received by (signature)**	**Date**	**Time**
[illegible]	7/28/11	1200	[illegible]	7/28/11	1400			

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Appendix D

Laboratory Analytical Procedures

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D1 Sample Laboratory Preparation Methods

LLNL was tasked with processing and analyzing over 300 environmental samples for ^{137}Cs, ^{241}Am, plutonium and uranium isotopes, and within the analyte detection and quantification capabilities of specified measurement techniques. Initial sample processing included sample dissection, freeze or oven drying, and sample volume reduction (sample combustion) prior to wet chemistry and radiometric analysis. The range of environmental samples for analysis included those discussed previously in Section 4.

D1.1 Sample Shipping and Handling

Vegetation, fauna, marine sediment, and soil collected in the field were typically sealed inside plastic bags or 1 L HDPE containers, labeled, and stored in a freezer or cool place without preservation. All fauna samples were collected and shipped as whole animals with exception of halibut and Pacific cod.

Samples were shipped overnight from Alaska to the San José airport in northern California, and then immediately transported by road (approximately 30 miles) to LLNL. The preferred shipping container type was a polystyrene cooler (20 L). Each sample shipment was accompanied by COC documentation showing a listing of samples identified by a shipment number, a ticket identification number, a sample site code, a sample location code, container type, level of preservation (if any), and a matrix identification code along with a listing of any analytical requirements. Upon arrival of the samples at LLNL, a validation check was performed on the basis of the COC sample documentation and any variances identified (Hamilton et al. 2012a). The samples were generally received in good condition.

Overall, LLNL analyzed 193 fauna samples, 96 vegetation samples, 6 soil samples, and 2 sediment samples along with 21 duplicates.

D.1.2 Initial Sample Processing and Preparation Procedures

Biological samples, including chiton, horse mussel, sea urchin, rockfish, halibut, Pacific cod, Irish lord, octopus, gull eggs, and Dolly Varden, were dried by lyophilization in an industrial-size freeze dryer (Northstar model 3666, ~1.1 cubic meter capacity) containing a modified condenser system (–50 °C) and liquid nitrogen (LN) trap coupled to two large-capacity Sargent-Welch vacuum pumps running in series. The condenser and LN trap collect sublimed sample tissue water and require regular servicing to remove ice. Towards the end of the drying cycle, the freeze dryer chamber was opened up, and tissue samples were allowed to partially thaw at room temperature for several hours. This partial-thawing process allows residual tissue-bound water to migrate to the porous outer (dry) surface of the sample material and helps accelerate the drying process. The freeze dryer was otherwise operated continuously for a 16-week period with drying times for each load of samples varying between 3 to 6 weeks. Samples were considered dry after two or more consecutive weights showed little or no change based on self-imposed laboratory DQOs (<0.1% uncertainty) in reported normalization (dry/wet) weights. Biological samples were processed as received with the exceptions of rockweed and horse mussel. Rockweed samples were hand-picked after drying to remove foreign material. Horse mussels were sized, weighed, and then ‘shucked’ to remove soft tissue. Only the soft

tissue of horse mussel was processed for analysis. The shells of gull eggs were also discarded prior to analysis.

The majority of the large-volume dragon kelp and rockweed samples (up to 5 kilograms [kg] each) were dried using a modified procedure to reduce processing times based on initial tests performed using lyophilization freeze drying. The remaining samples were weighed and then allowed to thaw (24–36 hours) sitting inside large plastic funnels propped up inside 50 L plastic containment bins. The free water (including sea salts) was allowed to drain directly into glass beakers sitting inside the containment bins. The amount of free liquid recovered from these samples averaged between 2 and 3 kg. The beakers and residual biological material were then dried to constant weight in a fan-forced drying oven at 60 °C. Lichen samples were also oven dried to facilitate screening the samples for the presence of ^{134}Cs from Fukushima. In this instance, the dried lichen samples were homogenized in a laboratory blender, packed into standard geometry counting vials, and analyzed by high-resolution gamma spectrometry. The Marshall Islands Program gamma facility houses up to 24 high-resolution gamma detectors coupled to a DEC VAXStation operating under Canberra Nuclear Data Systems software. Details concerning detector calibration and quality assurance procedures are reported elsewhere (Brunk 1995; Hamilton et al. 2000).

Soil and sediments samples were also processed by oven drying to constant weight at 60 °C and then passed through a 2 millimeter (mm) stainless steel standard sieve. Soil samples contained varying quantities of gravel (≥2 mm size fraction) and easily partitioned organic debris consisting mostly of plant roots and grass. Table D1shows the size fractionation of soils and sediments. SOIL-AD-XXX-3 contained a majority portion of organic debris. Measurement data are reported for the <2 mm size fractions of soil and sediment only.

Table D1. Size Fractionation of Soils and Sediments

Ticket	Location	Total Sample Dry Mass (g)	Size fraction (%, dry weight)		
			<2 mm	≥2mm	Easily Partitioned Organic
JET-741	SEDI-LS-LT1-1	693.51	87	13.2	0.0
JET-742	SEDI-ML-MT1-1	520.22	98	1.9	0.0
JDQ-901	SOIL-AI-ML1-1	741.03	24	75.4	0.7
JDQ-902	SOIL-AI-LT1-2	61.69	73	20.1	6.8
JDL-903	SOIL-AI-CTI-3	124.57	95	3.0	1.8
JDQ-904	SOIL-AD-XXX-1	88.69	59	27.2	14.2
JDQ-905	SOIL-AD-XXX-2	143.63	67	21.2	12.2
JDQ-906	SOIL-AD-XXX-3	26.49	34	20.6	45.0

D.1.3 Sample Combustion

Analytical results of previous sampling events showed that background activity concentrations of selected target radionuclides in the vicinity of Amchitka Island were at or below levels of detection. Under Amchitka 2011, emphasis was placed on collecting an adequate number and larger-sized samples to support future trending analysis. The mean sample dry weight of material for analysis of target radionuclides ranged from 40 grams (g) for horse mussel to well over 1,000 g for halibut, Pacific cod, dragon kelp, and rockweed. To reduce the sample mass to a

more-manageable size for wet chemistry, it was necessary to reduce the volume of material by combustion in a muffle furnace.

Samples were typically loaded into aluminum pans or glass beakers and ashed at 450 °C for 3 to 4 days after slowly taking the muffle furnace up to temperature through a series of ramping steps. Rockweed was handpicked for foreign material prior to ashing. The foreign material included small rocks, snails, sea urchins and starfish, amphipods, and foreign plant species, and varied in mass between 1 and 44 g.

It was not always possible to produce a total organic-free ash, but experience had shown that residual trace quantities of organic material (largely charcoal) can be effectively destroyed by addition of hydrogen peroxide during the acid dissolution steps to follow. The full listing of normalization dry/wet weights as well as ash/dry weights is provided in Appendix A.

Special modified handling and drying procedures were employed for large-volume dragon kelp and rockweed to reduce drying times (Hamilton et al. 2012a). Also, previous experience had shown that allowing the free liquid and polysaccharide material to drain from these materials prior to combustion in a muffle furnace significantly helps reduce the tendency of the material to caramelize into hard clumps. In this case, the free liquid was processed separately and then recombined with the dry ash prior to wet sample and dissolution. Additional details concerning sample processing and handling, and size fractionation of marine sediment and soils are given elsewhere (Hamilton et al. 2012a).

Marine sediment, soil, and lichen were initially oven dried to constant weight at 60 °C. The dried lichen samples were homogenized in a laboratory blender, packed into standard geometry counting vials, and initially analyzed by high-resolution gamma spectrometry. The lichen material was recovered and used for subsequent analyses of uranium and plutonium isotopes and ^{241}Am. Dried samples of vegetation and fauna were rendered down to a manageable volume using dry ashing techniques (Hamilton et al. 2012a) and, after addition of known quantities of stable Cs, ^{242}Pu, ^{243}Am yield tracers, digested in concentrated nitric acid (HNO_3) with periodic additions of hydrogen peroxide. After several days of treatment to produce a relatively clear, bright solution with minimal particulate residue, the sample digest was filtered and evaporated to near dryness. The dried sample residue was then rehydrated in dilute hydrochloric acid (HCl). A small sub-aliquot of the original acid digest (<5 percent) was consumed during the analysis of uranium isotopes by direct aspiration ICP-MS with all the remaining material saved for sequential analysis of ^{137}Cs, plutonium isotopes, and ^{241}Am.

Table D2 provides a summary of the data for each biological species and matrix type. In general, sample dry and ash weights proved to be relatively consistent within the same biological species. Dried dragon kelp and rockweed contained visible quantities of sea salt. Additionally, the high salt content of samples tended to add to the tedious nature of performing wet chemistry separations on what were already very large, bulky samples. Because seawater contains macro quantities of uranium isotopes at about 3.3 microgram (µg) total uranium per liter, the presence of sea salt uranium should be evaluated as a possible contaminant in the final analysis.

The normalization dry/wet weights as well as ash/dry weights (as an indication of organic content) of lichen samples were highly variable. However, it is not clear how these findings can be used to provide a quantitative basis for normalizing activity concentrations of target radionuclides (specifically cesium isotopes) found in lichen across different sample sites.

Table D2. Summary Data of Total Sample Wet, Dry and Ash Weights (and Normalization Dry/Wet and Ash/Dry Weight Ratios) by Species or Matrix Type

Species or Sample Matrix	Mean Values					
	Number of Samples	Wet Wt (g)	Dry Wt (g)	Dry/wet (%)	Ash Wt (g)	Ash/dry (%)
Dragon kelp	50	5321	747	14.9 ± 1.6	234.7	31.4 ± 4.2
Chiton	15	638	135	21.4 ± 1.8	63.1	46.8 ± 2.4
Horse mussel	15	183	40	23.3 ± 7.1	6.4	16.1 ± 3.3
Sea urchin	15	647	172	26.5 ± 1.4	132.0	76.9 ± 2.3
Octopus	4	2608	421	18.8 ± 2.8	65.1	15.4 ± 3.9
Rockfish	46	1043	267	25.3 ± 8.9	43.8	16.4 ± 4.1
Rock greenling	50	620	134	21.5 ± 1.2	24.2	18.1 ± 2.3
Irish lord	45	688	147	21.5 ± 1.6	35.4	24.0 ± 4.0
Halibut	5	5993	1687	28.2 ± 1.9	150.8	8.9 ± 1.1
Pacific cod	5	5158	1046	20.3 ± 0.9	176.7	16.9 ± 1.3
Rockweed	50	5570	1041	18.8 ± 3.0	294.2	28.3 ± 4.6
Star Reindeer lichen	6	601	280	47.0 ± 15.0	13.4	4.8 ± 3.7
Gull eggs	1	1156	333	28.9	15.2	4.5
Dolly Varden	2	2972	747	25.2 ± 2.1	82.5	11.0 ± 1.5
Marine Sediment	2	839	616	73.1 ± 20.8	601	97.4 ± 1.6
Terrestrial Soil	6	443	197	35.9 ± 20.8	137	69.2 ± 23.1
Total Samples Processed	**318**					

D.2 Analytical Methods

D.2.1 Determination of ^{137}Cesuim

The bulk of the ^{137}Cs analyses were performed at LLNL using gas proportional beta-spectrometry. The remaining samples, including marine sediment, soil, and star reindeer lichen, were analyzed by high-resolution gamma-spectrometry. Cesium isotopes, including a known quantity of stable cesium carrier (10 milligrams [mg]), were first separated from solution by extraction on microcrystalline ammonium molybdophosphate and then chemically isolated and purified using ion-exchange chromatography on BIO-REX-40 cation exchange resin (Hamilton et al. 2008). The column elution containing the purified cesium isotopes was then evaporated to dryness, rehydrated in dilute sodium hydroxide solution, and cesium isotopes were precipitated as Cs_2PtCl_6 by addition of chloroplatinic acid (H_2PtCl_6). The purification of cesium is necessary to determine chemical recovery and remove naturally occurring potassium and rubidium from interfering with beta activity measurements of ^{137}Cs and ^{134}Cs. The precipitate was then collected on a pre-weighed filter paper, dried and reweighed to a constant weight. The filter containing the Cs_2PtCl_6 precipitate was subsequently mounted on a ring and disc holder, and counted on a gas-proportional beta-spectrometry system (Gamma Products, Inc., G5000 with upgrades).

D.2.2 Determination of ^{241}Americium

^{241}Am measurements were performed at LLNL using alpha spectrometry. Vegetation and fauna samples were first rendered down to manageable volumes using dry and wet ashing techniques as described previously. Americium and plutonium isotopes, including known quantities of ^{243}Am and ^{242}Pu added as isotopic dilution yield tracers, were first separated from the bulk sample digest solution by co-precipitation on aluminum phosphate. A secondary co-precipitation step was often employed for large, bulky samples. The analytes of interest, including plutonium isotopes and ^{241}Am, were then chemically isolated and purified using ion-exchange chromatography. For analysis of ^{241}Am, the effluent and washes from the TEVA plutonium column were taken to dryness, the residue rehydrated in a minimum volume of 2 moles (M) HNO_3, and the solution passed through a TRU column preconditioned with 3 column volumes of 2 M HNO_3. The TRU column was then washed with successive portions of 2 M HNO_3, 0.5 M HNO_3, and 9 M HCl, and americium eluted using 10 column volumes of 4 M HCl. The americium fraction in 4 M HCl was evaporated to dryness, the residue was rehydrated in 4 milliliter (mL) of 9 M HCl, the solution was passed through a two-layer ion-exchange column consisting of an upper layer of 2–3 mL Bio-Rad 50W-X8 cation-exchange resin (200–400 mesh) and a lower layer of 2–3 mL of Bio-Rad AG1-X8 anion-exchange resin (100–200 mesh), and the column was rinsed with five column volumes of 9 M HCl. The two-layer ion-exchange column was employed to provide further separation from interfering alpha emitters, including trace quantities of polonium, plutonium, uranium, and thorium, as well as iron. The purified americium fraction from the column effluent was evaporated to dryness with addition of concentrated HNO_3 and prepared for alpha-spectrometric detection and measurement by electrodeposition on stainless steel discs (modified after Wong et. al. 1994). Type I ultrapure water (resistivity 18.2 megohms [MΩ] per·centimeter (cm) at 25 °C; total organic carbon [TOC] < 10 parts per billion [ppb]) was used for preparation of all solutions (produced from a Milli-Q synthesis A10 water purification system).

The americium source plates were counted on an EG&G Ortec Octête PC alpha spectrometry system employing "ULTRA" ion-implanted-silicon charged-particle detectors and running on AlphaVision (version 5.3) and MAESTRO for Windows (model A65-B32; version 6.05). A counting time of approximately 72,000 seconds was originally established to yield a contract compliance minimum detectable activity (MDA) for ^{241}Am measurements of 0.03–0.06 picocurie (pCi). In practice, an effort was made to extend counting times to reduce minimum quantifiable values.

D.2.3 Determination of Plutonium Isotopes

Plutonium isotope analyses were performed at LLNL on a Thermo Electron XSeries quadrupole inductively coupled plasma mass spectrometer (ICP-MS) fitted with a concentric nebulizer. Americium and plutonium isotopes, including known quantities of ^{243}Am and ^{242}Pu added as isotopic dilution yield tracers, were first separated from the bulk sample digest solution by co-precipitation on aluminum phosphate. A secondary co-precipitation step was often employed for large, bulky samples. The analytes of interest, including plutonium isotopes and ^{241}Am, were then chemically isolated and purified using ion-exchange chromatography. The ion-exchange purification step for plutonium involved rehydrating the aluminum-ferric precipitate in a minimal volume of 2.5M HNO_3 to1 M aluminum nitrate solution, and passing the sample through a

preconditioned TEVA column. The TEVA column was then washed with 9M HCl followed by successive rinses of 8M HCl, and plutonium isotopes eluted into a glass beaker using 20 mL 0.01M HCl, 0.05 M hydrofluoric acid, and 0.1M ammonium iodide solution. The column effluent and washings were reserved for analysis of americium isotopes. The purified plutonium fraction was then evaporated to dryness, treated with successive portions of HNO_3, syringe filtered (0.45 micrometer [µm]) into a 15 mL conical tube, and then made up to volume for ICP-MS analysis. Corrections for hydride (^{238}UH) interference for ICP-MS detection and measurement of ^{239}Pu were assessed as an integral part of the analysis. Type I ultrapure water (resistivity 18.2 MΩ/cm at 25°C; TOC < 10 ppb) was used for preparations of all solutions (produced from a Milli-Q synthesis A10 water purification system). Target plutonium isotopes of interest included ^{239}Pu and ^{240}Pu.

D.2.4 Determination of Uranium Isotopes

Uranium isotope analyses were performed at LLNL on a Thermo Electron XSeries quadrupole ICP-MS fitted with a SeaSpray nebulizer. A direct dilute-and-shoot method was employed using 2 percent ultrapure HNO_3 as the sample matrix after addition of a known quality of uranium-233 (^{233}U) isotope dilution tracer. A typical sample analysis involved taking a small sub-aliquot (1−2 mL) of the original sample, digesting to dryness, and diluting the residue to volume (approximately 10 mL) in an ICP-MS tube in the presence of ^{233}U. All analyses were performed under established operational limitations set by the ICP-MS lab for total dissolved solids content (<1–2 percent) and total uranium content (<0.2 µg/mL). Type I ultrapure water (resistivity 18.2 MΩ/cm at 25 °C; TOC < 10 ppb) was used for preparations of all solutions (produced from a Milli-Q synthesis A10 water purification system).

Target uranium isotopes of interest included ^{238}U, (^{236}U), ^{235}U, and ^{234}U. ^{236}U was included in the analysis suite as a potential isotopic signature tracer of anthropogenic uranium, albeit at relatively high screening levels.

D.2.5 Determination of Enriched Tritium

Tritium concentrations are expressed in Tritium Units (TU), in which 1 TU indicates a Tritium/Hydrogen abundance ratio of 10^{-18}. The values refer to the tritium scale recommended by the National Institute of Science and Technology (NIST, formerly National Bureau of Standards), and International Atomic Energy Agency (IAEA). The TU-numbers are based on the NIST tritium water standard 4926E. Age corrections and conversions are made using the recommended half-life of 12.32 years (i.e., a decay rate of lambda = 5.626 percent per year [yr]). In this scale, 1 TU is equivalent to 7.151 disintegrations per minute per kilogram (dpm/kg) water, or 3.222 pCi/kg water, or 0.1192 becquerel per kilogram (Bq/kg) water (1 Bq = 1 disintegration per second or 60 dpm).

D.2.5.1 Distillation

The water sample is distilled with continuous reflux to dryness or near dryness. During the procedure, the still is vented to the ambient air through a drying agent to avoid contamination of the sample by atmospheric water vapor.

D.2.5.2 Electrolytic Enrichment

The object of this procedure is to reduce the volume of the sample while preserving a large fraction of the tritium. A portion of the sample is transferred to the electrolytic enrichment cell. To that portion, 2 mL of concentrated sodium hydroxide solution (made from dead water [i.e., tritium-free water] and sodium peroxide or oxide) is added, and the remainder of the sample is transferred to a container on top of the cell.

The sample is electrolyzed in a cold water bath. Once a day the solution in the cell is topped up, and the procedure is continued. This procedure takes 10 to 14 days, and the remaining amount of water typically contains 80 percent of the original amount of tritium. The enriched water sample is then vacuum distilled from the sodium hydroxide, and the yield is weighed to ±2 mg).

D.2.5.3 Preparation of Sampling Gas

About 3 mL of the enriched water sample is injected into a vacuum system. The water evaporates, and the vapor is reduced by hot magnesium metal to hydrogen gas, which is absorbed on activated charcoal at liquid nitrogen temperature in a stainless steel pressure cylinder. Approximately 4 L atmosphere of hydrogen is obtained this way.

D.2.5.4 Low-Level Counting

The low-level gas proportional counters have an active volume of 1 L and are shielded by 2.5 cm of selected lead, a ring of anti-coincidence Geiger counters, 10 cm of paraffin wax, boric acid and/or borated polyethylene, and at least 20 cm of iron, plus the walls and ceiling of the building. The counter is first filled with 10 pounds per square inch (psi) (67 kilopascals [kPa]) of propane. Thereafter, the sample hydrogen gas, under pressure in its cylinder, is added to the counter for a total pressure of 40 psi (300 kPa). The counter is then sealed off, and the gas amplification is set to specifications by adjusting working voltage. After that, counting proceeds until criteria for accuracy or sensitivity have been met. The pulses are sorted into several channels, of which some are used for continuous control of the gas amplification. Counting times are 6 to 20 hours. A 1 TU original sample enriched from 275 to 6 mL typically shows 0.6 counts per minute (cpm) in the tritium channel above a background of 0.40 cpm, known to ±0.02 cpm. The control of filling and counting procedures and calculation of results, as well as numerous checks on the performance of the machinery, are computerized.

When a sample is ready for activity measurement, the sample I.D. is merged with all the process information in the computer. Together, the data are entered into the particular sample file along with counter-fill data, sample pressure and temperature, a unique run number, and the time and date. Upon completion of the counting, temperature and pressure of the sample within the counter are again recorded for comparison and checked for computer input error. All records of the sample preparation information and counting results are stored in computer files.

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Appendix E

Individual Sample Listing of Wet Weights, Dry Weights, and Ash Weights

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Sample ID#	Location	Wet Weight (g)	Dry Weight (g)	Dry/Wet	Ash Weight (g)	Ash/Dry
JDR-098	CHIT-AN-ANT1-1	970.6	199.29	20.5%	89.17	44.7%
JDR-099	CHIT-AN-ANT2-1	894.4	178.44	20.0%	83.44	46.8%
JDR-100	CHIT-AN-ANT3-1	905.1	177.99	19.7%	85.37	48.0%
JDR-141	CHIT-AS-AST1-1	548.19	133.41	24.3%	70.12	52.6%
JDR-142	CHIT-AS-AST2-1	853.9	166.81	19.5%	79.46	47.6%
JDR-143	CHIT-AS-AST3-1	525.52	111.56	21.2%	51.75	46.4%
JDQ-969	CHIT-CN-CT1-1	501.37	107.05	21.4%	51.69	48.3%
JDQ-970	CHIT-CN-CT2-1	577.22	121.97	21.1%	52.10	42.7%
JDQ-971	CHIT-CN-CT3-1	496.58	101.17	20.4%	47.90	47.3%
JDR-012	CHIT-LS-LT1-1	506.89	102.19	20.2%	46.30	45.3%
JDR-013	CHIT-LS-LT2-1	555.0	118.48	21.3%	54.60	46.1%
JDR-014	CHIT-LS-LT3-1	655.6	137.69	21.0%	61.40	44.6%
JDR-055	CHIT-ML-MT1-1	493.8	130.95	26.5%	65.25	49.8%
JDR-056	CHIT-ML-MT2-1	563.41	121.34	21.5%	56.18	46.3%
JDR-057	CHIT-ML-MT3-1	518.3	114.22	22.0%	52.11	45.6%
JDQ-909	DOLL-AD-XXX-1	3330.2	816.48	24.5%	101.26	12.4%
JDQ-908	DOLL-AI-XXX-1	2614.53	678.37	25.9%	63.79	9.4%
JDR-088	EUAL-AN-ANT1-1	5073.38	604.55	11.9%	232.91	38.5%
JDR-089	EUAL-AN-ANT1-2	5133.44	752.86	14.7%	233.22	31.0%
JDR-090	EUAL-AN-ANT1-3	5564.65	720.27	12.9%	261.51	36.3%
JDR-091	EUAL-AN-ANT2-1	5285.04	724.8	13.7%	240.24	33.1%
JDR-092	EUAL-AN-ANT2-2	5646.31	885.76	15.7%	241.43	27.3%
JDR-093	EUAL-AN-ANT2-3	5132.64	738.51	14.4%	229.17	31.0%
JDR-094	EUAL-AN-ANT3-1	5044.63	675.00	13.4%	207.28	30.7%
JDR-095	EUAL-AN-ANT3-2	5543.63	813.06	14.7%	233.65	28.7%
JDR-096	EUAL-AN-ANT3-3	5657.35	843.32	14.9%	237.54	28.2%
JDR-097	EUAL-AN-DUP	5111.64	813.15	15.9%	224.53	27.6%
JDR-131	EUAL-AS-AST1-1	5251.6	797.42	15.2%	215.14	27.0%
JDR-132	EUAL-AS-AST1-2	4946.29	620.75	12.5%	191.03	30.8%
JDR-133	EUAL-AS-AST1-3	5422.4	564.96	10.4%	230.72	40.8%
JDR-134	EUAL-AS-AST2-1	5182.88	729.13	14.1%	228.8	31.4%
JDR-135	EUAL-AS-AST2-2	5413.26	764.88	14.1%	252.08	33.0%
JDR-136	EUAL-AS-AST2-3	5187.2	713.97	13.8%	265.96	37.3%
JDR-137	EUAL-AS-AST3-1	5594.65	765.64	13.7%	243.22	31.8%
JDR-138	EUAL-AS-AST3-2	5052.19	533.23	10.6%	228.45	42.8%
JDR-139	EUAL-AS-AST3-3	5308.22	601.8	11.3%	227.38	37.8%
JDR-140	EUAL-AS-DUP	5422.84	737.09	13.6%	240.29	32.6%
JDQ-718	EUAL-CN-CT1-1	5447.78	735.82	13.5%	237.23	32.2%

Sample ID#	Location	Wet Weight (g)	Dry Weight (g)	Dry/Wet	Ash Weight (g)	Ash/Dry
JDQ-960	EUAL-CN-CT1-2	5444.33	835.02	15.3%	250.31	30.0%
JDQ-961	EUAL-CN-CT1-3	5432.55	886.73	16.3%	229.3	25.9%
JDQ-962	EUAL-CN-CT2-1	5484.68	860.18	15.7%	255.18	29.7%
JDQ-963	EUAL-CN-CT2-2	5335.19	850.08	15.9%	235.35	27.7%
JDQ-964	EUAL-CN-CT2-3	5539.02	763.92	13.8%	247.12	32.3%
JDQ-965	EUAL-CN-CT3-1	5941.18	852.43	14.3%	260.88	30.6%
JDQ-966	EUAL-CN-CT3-2	5155.49	716.67	13.9%	241.06	33.6%
JDQ-967	EUAL-CN-CT3-3	5739.17	883.46	15.4%	233.79	26.5%
JDQ-968	EUAL-CN-DUP	5215.6	784.7	15.0%	213.15	27.2%
JDR-011	EUAL-LS-DUP	5279.49	879.03	16.6%	231.36	26.3%
JDR-002	EUAL-LS-LT1-1	5054.6	540.8	10.7%	214.55	39.7%
JDR-003	EUAL-LS-LT1-2	6142.17	987.84	16.1%	243.47	24.6%
JDR-004	EUAL-LS-LT1-3	5499.76	910.87	16.6%	241.5	26.5%
JDR-005	EUAL-LS-LT2-1	5069.43	837.9	16.5%	236.46	28.2%
JDR-006	EUAL-LS-LT2-2	4966.46	684.16	13.8%	205.11	30.0%
JDR-007	EUAL-LS-LT2-3	5700.19	787.96	13.8%	258.61	32.8%
JDR-008	EUAL-LS-LT3-1	5692.9	892.41	15.7%	265.53	29.8%
JDR-009	EUAL-LS-LT3-2	4981.48	699.5	14.0%	218.53	31.2%
JDR-010	EUAL-LS-LT3-3	5119.92	606.7	11.8%	218.3	36.0%
JDR-054	EUAL-ML-DUP	5486.47	728.24	13.3%	241.43	33.2%
JDR-045	EUAL-ML-MT1-1	5364.28	671.43	12.5%	258.08	38.4%
JDR-046	EUAL-ML-MT1-2	5163.77	694.37	13.4%	236.39	34.0%
JDR-047	EUAL-ML-MT1-3	5517.91	656.11	11.9%	243.63	37.1%
JDR-048	EUAL-ML-MT2-1	4754.8	637.69	13.4%	219.83	34.5%
JDR-049	EUAL-ML-MT2-2	5406.16	762.88	14.1%	249.95	32.8%
JDR-050	EUAL-ML-MT2-3	4989.72	662.15	13.3%	230.19	34.8%
JDR-051	EUAL-ML-MT3-1	5149.25	731.84	14.2%	222.07	30.3%
JDR-052	EUAL-ML-MT3-2	4968.25	680.45	13.7%	216.46	31.8%
JDR-053	EUAL-ML-MT3-3	5047.85	732.3	14.5%	215.3	29.4%
JDQ-875	FUCU-AN-ANT1-1	5313.65	1043.0	19.6%	321.32	30.8%
JDQ-876	FUCU-AN-ANT1-2	5218.8	809.2	15.5%	312.48	38.6%
JDQ-877	FUCU-AN-ANT1-3	5250.18	962.0	18.3%	256.79	26.7%
JDQ-878	FUCU-AN-ANT2-1	5108.75	809.1	15.8%	296.19	36.6%
JDQ-879	FUCU-AN-ANT2-2	5336.84	1003.6	18.8%	403.09	40.2%
JDQ-880	FUCU-AN-ANT2-3	5175.69	1227.0	23.7%	322.05	26.2%
JDQ-881	FUCU-AN-ANT3-1	5155.01	900.8	17.5%	329.87	36.6%
JDQ-882	FUCU-AN-ANT3-2	5034.65	1030.0	20.5%	305.68	29.7%
JDQ-883	FUCU-AN-ANT3-3	5279.71	1062.0	20.1%	314.64	29.6%

Sample ID#	Location	Wet Weight (g)	Dry Weight (g)	Dry/Wet	Ash Weight (g)	Ash/Dry
JDQ-884	FUCU-AN-DUP	5114.27	1099.1	21.5%	275.31	25.0%
JDQ-885	FUCU-AS-AST1-1	5230.61	848.2	16.2%	214.09	25.2%
JDQ-886	FUCU-AS-AST1-2	5253.3	946.8	18.0%	267.44	28.2%
JDQ-887	FUCU-AS-AST1-3	5139.53	946.8	18.4%	243.21	25.7%
JDQ-888	FUCU-AS-AST2-1	5258.51	1087.7	20.7%	347.72	32.0%
JDQ-889	FUCU-AS-AST2-2	5233.71	1034.0	19.8%	256.5	24.8%
JDQ-890	FUCU-AS-AST2-3	5167.78	1051.5	20.3%	257.04	24.4%
JDQ-891	FUCU-AS-AST3-1	5103.17	968.0	19.0%	321.62	33.2%
JDQ-892	FUCU-AS-AST3-2	5677.51	1152.7	20.3%	419.59	36.4%
JDQ-893	FUCU-AS-AST3-3	6915.73	1317.0	19.0%	499.92	38.0%
JDQ-894	FUCU-AS-DUP	5307.91	1027.0	19.3%	240.64	23.4%
JDQ-845	FUCU-CN-CT1-1	5369	931.0	17.3%	262.37	28.2%
JDQ-846	FUCU-CN-CT1-2	5177	821.8	15.9%	235.51	28.7%
JDQ-847	FUCU-CN-CT1-3	6072	1029.8	17.0%	263.60	25.6%
JDQ-848	FUCU-CN-CT2-1	5459.32	1320.8	24.2%	390.37	29.6%
JDQ-849	FUCU-CN-CT2-2	5582.24	1258.0	22.5%	279.91	22.3%
JDQ-850	FUCU-CN-CT2-3	5212.28	986.0	18.9%	311.29	31.6%
JDQ-851	FUCU-CN-CT3-1	5393.9	1001.0	18.6%	240.15	24.0%
JDQ-852	FUCU-CN-CT3-2	5312.29	905.2	17.0%	331.22	36.6%
JDQ-853	FUCU-CN-CT3-3	5502.41	867.3	15.8%	229.72	26.5%
JDQ-854	FUCU-CN-DUP	5413	838.7	15.5%	230.82	27.5%
JDQ-864	FUCU-LS-DUP	5446	990.9	18.2%	261.85	26.4%
JDQ-855	FUCU-LS-LT1-1	5413	1002.2	18.5%	246.79	24.6%
JDQ-856	FUCU-LS-LT1-2	5634	920.5	16.3%	240.56	26.1%
JDQ-857	FUCU-LS-LT1-3	6290	946.2	15.0%	230.71	24.4%
JDQ-858	FUCU-LS-LT2-1	7317	928.2	12.7%	277.78	29.9%
JDQ-859	FUCU-LS-LT2-2	7502	1035.3	13.8%	282.07	27.2%
JDQ-860	FUCU-LS-LT2-3	7455	1219.0	16.4%	330.12	27.1%
JDQ-861	FUCU-LS-LT3-1	5424.9	1120.2	20.6%	298.86	26.7%
JDQ-862	FUCU-LS-LT3-2	5356.43	1176.5	22.0%	383.77	32.6%
JDQ-863	FUCU-LS-LT3-3	5327.78	1454.0	27.3%	349.46	24.0%
JDQ-874	FUCU-ML-DUP	5745.0	1323.7	23.0%	368.37	27.8%
JDQ-865	FUCU-ML-MT1-1	5720	1373.1	24.0%	371.53	27.1%
JDQ-866	FUCU-ML-MT1-2	6042	995.9	16.5%	240.79	24.2%
JDQ-867	FUCU-ML-MT1-3	5309.26	1154.6	21.7%	345.71	29.9%
JDQ-868	FUCU-ML-MT2-1	5904	1144.2	19.4%	302.16	26.4%
JDQ-869	FUCU-ML-MT2-2	6049	861.3	14.2%	230.35	26.7%
JDQ-870	FUCU-ML-MT2-3	5666	815.8	14.4%	215.15	26.4%

Sample ID#	Location	Wet Weight (g)	Dry Weight (g)	Dry/Wet	Ash Weight (g)	Ash/Dry
JDQ-871	FUCU-ML-MT3-1	**5473.29**	**1127.0**	**20.6%**	**239.85**	**21.3%**
JDQ-872	FUCU-ML-MT3-2	**5475.05**	**1140.0**	**20.8%**	**250.86**	**22.0%**
JDQ-873	FUCU-ML-MT3-3	**5195.0**	**1029.4**	**19.8%**	**261.81**	**25.4%**
JET-744	GOOS-AI-XXX-1	**464.81**	**175.00**	**37.6%**	**5.05**	**2.9%**
JDR-118	GREN-AN-ANT1-1	**512.25**	**115.4**	**22.5%**	**20.54**	**17.8%**
JDR-119	GREN-AN-ANT1-2	**530.55**	**127.03**	**23.9%**	**18.89**	**14.9%**
JDR-120	GREN-AN-ANT1-3	**530.55**	**145.67**	**27.5%**	**25.94**	**17.8%**
JDR-121	GREN-AN-ANT2-1	**608.7**	**131.57**	**21.6%**	**27.60**	**21.0%**
JDR-122	GREN-AN-ANT2-2	**641.0**	**138.3**	**21.6%**	**27.21**	**19.7%**
JDR-123	GREN-AN-ANT2-3	**564.75**	**119.1**	**21.1%**	**16.28**	**13.7%**
JDR-124	GREN-AN-ANT3-1	**533.74**	**116.94**	**21.9%**	**21.49**	**18.4%**
JDR-125	GREN-AN-ANT3-2	**636.5**	**137.07**	**21.5%**	**20.13**	**14.7%**
JDR-126	GREN-AN-ANT3-3	**561.94**	**120.76**	**21.5%**	**22.93**	**19.0%**
JDR-127	GREN-AN-DUP	**530.7**	**111.42**	**21.0%**	**21.99**	**19.7%**
JDR-161	GREN-AS-AST1-1	**575.73**	**120.85**	**21.0%**	**24.36**	**20.2%**
JDR-162	GREN-AS-AST1-2	**598.24**	**126.8**	**21.2%**	**21.55**	**17.0%**
JDR-163	GREN-AS-AST1-3	**613.4**	**127.71**	**20.8%**	**20.66**	**16.2%**
JDR-164	GREN-AS-AST2-1	**886.9**	**220.81**	**24.9%**	**32.77**	**14.8%**
JDR-165	GREN-AS-AST2-2	**658.7**	**144.01**	**21.9%**	**25.39**	**17.6%**
JDR-166	GREN-AS-AST2-3	**708.5**	**152.13**	**21.5%**	**27.89**	**18.3%**
JDR-167	GREN-AS-AST3-1	**642.4**	**134.88**	**21.0%**	**23.12**	**17.1%**
JDR-168	GREN-AS-AST3-2	**500.65**	**106.36**	**21.2%**	**23.67**	**22.3%**
JDR-169	GREN-AS-AST3-3	**482.02**	**100.93**	**20.9%**	**19.42**	**19.2%**
JDR-170	GREN-AS-DUP	**602.3**	**120.11**	**19.9%**	**23.74**	**19.8%**
JDQ-989	GREN-CN-CT1-1	**623.4**	**129.32**	**20.7%**	**26.00**	**20.1%**
JDQ-990	GREN-CN-CT1-2	**533.21**	**112.27**	**21.1%**	**21.22**	**18.9%**
JDQ-991	GREN-CN-CT1-3	**659.2**	**144.66**	**21.9%**	**30.20**	**20.9%**
JDQ-992	GREN-CN-CT2-1	**769.6**	**157.9**	**20.5%**	**30.16**	**19.1%**
JDQ-993	GREN-CN-CT2-2	**616.8**	**134.43**	**21.8%**	**21.73**	**16.2%**
JDQ-994	GREN-CN-CT2-3	**703.6**	**152.47**	**21.7%**	**25.80**	**16.9%**
JDQ-995	GREN-CN-CT3-1	**643.1**	**141.11**	**21.9%**	**24.98**	**17.7%**
JDQ-996	GREN-CN-CT3-2	**697.2**	**160.06**	**23.0%**	**31.82**	**19.9%**
JDQ-997	GREN-CN-CT3-3	**806.6**	**175.66**	**21.8%**	**30.73**	**17.5%**
JDQ-998	GREN-CN-DUP	**569.31**	**118.05**	**20.7%**	**21.54**	**18.2%**
JIW-344	GREN-LS-DUP	**693.9**	**142.9**	**20.6%**	**31.17**	**21.8%**
JDR-032	GREN-LS-LT1-1	**598.15**	**126.9**	**21.2%**	**22.50**	**17.7%**
JDR-033	GREN-LS-LT1-2	**435.69**	**92.04**	**21.1%**	**16.14**	**17.5%**
JDR-034	GREN-LS-LT1-3	**483.21**	**103.18**	**21.4%**	**27.93**	**27.1%**

Sample ID#	Location	Wet Weight (g)	Dry Weight (g)	Dry/Wet	Ash Weight (g)	Ash/Dry
JET-751	GREN-LS-LT2-1	619.9	128.29	20.7%	25.17	19.6%
JET-752	GREN-LS-LT2-2	716.4	155.34	21.7%	27.14	17.5%
JET-753	GREN-LS-LT2-3	714.6	150.18	21.0%	27.93	18.6%
JDR-038	GREN-LS-LT3-1	787.9	177.5	22.5%	22.69	12.8%
JIW-342	GREN-LS-LT3-2	627.5	127.91	20.4%	25.44	19.9%
JIW-343	GREN-LS-LT3-3	588.25	121.66	20.7%	22.44	18.4%
JDR-084	GREN-ML-DUP	593.38	122.37	20.6%	23.07	18.9%
JDR-075	GREN-ML-MT1-1	729.3	167.43	23.0%	27.45	16.4%
JDR-076	GREN-ML-MT1-2	643.5	138.98	21.6%	26.88	19.3%
JDR-077	GREN-ML-MT1-3	770.3	159.53	20.7%	27.80	17.4%
JDR-078	GREN-ML-MT2-1	587.07	125.94	21.5%	20.66	16.4%
JDR-079	GREN-ML-MT2-2	540.79	115.52	21.4%	21.89	18.9%
JDR-080	GREN-ML-MT2-3	588.85	123.32	20.9%	24.07	19.5%
JDR-081	GREN-ML-MT3-1	635.8	131.1	20.6%	20.47	15.6%
JDR-082	GREN-ML-MT3-2	525.71	108.96	20.7%	18.58	17.1%
JDR-083	GREN-ML-MT3-3	575.79	121.53	21.1%	23.23	19.1%
JDQ-907	GWGU-AI-XXX-1	1155.5	333.4	28.9%	15.15	4.5%
JDR-129	HALI-AN-AN2M-1	7205.13	2158.06	30.0%	181.15	8.4%
JET-761	HALI-AN-DUP	4949.03	1493.29	30.2%	136.01	9.1%
JDR-000	HALI-CN-C2M-1	6284.2	1623.96	25.8%	175.77	10.8%
JDR-043	HALI-LS-L2M-1	5746.66	1496.83	26.0%	114.59	7.7%
JDR-086	HALI-ML-M2M-1	5782	1664.2	28.8%	146.43	8.8%
JDR-101	HMUS-AN-ANT1-1	220.01	40.24	18.3%	7.06	17.5%
JDR-102	HMUS-AN-ANT2-1	199.67	43.48	21.8%	6.32	14.5%
JDR-103	HMUS-AN-ANT3-1	241.29	54.14	22.4%	7.15	13.2%
JDR-144	HMUS-AS-AST1-1	176.1	35.15	20.0%	5.16	14.7%
JDR-145	HMUS-AS-AST2-1	227.55	35.87	15.8%	6.34	17.7%
JDR-146	HMUS-AS-AST3-1	178.8	35.07	19.6%	5.31	15.1%
JDQ-972	HMUS-CN-CT1-1	165.51	40.26	24.3%	7.7	19.1%
JDQ-973	HMUS-CN-CT2-1	178.81	39.46	22.1%	7.37	18.7%
JDQ-974	HMUS-CN-CT3-1	207.61	50.61	24.4%	8.18	16.2%
JDR-015	HMUS-LS-LT1-1	185.11	43.21	23.3%	7.13	16.5%
JDR-016	HMUS-LS-LT2-1	241.85	59.2	24.5%	8.66	14.6%
JDR-017	HMUS-LS-LT3-1	13.38	6.38	47.7%	0.36	5.6%
JDR-058	HMUS-ML-MT1-1	180.03	39.59	22.0%	7.15	18.1%
JDR-059	HMUS-ML-MT2-1	161.01	35.8	22.2%	6.18	17.3%
JDR-060	HMUS-ML-MT3-1	161.45	35.17	21.8%	5.45	15.5%
JIV-543	IRLO-AN-ANT1-1	624.7	133.1	21.3%	36.79	27.6%

Sample ID#	Location	Wet Weight (g)	Dry Weight (g)	Dry/Wet	Ash Weight (g)	Ash/Dry
JIV-544	IRLO-AN-ANT1-2	532.25	119.9	22.5%	30.63	25.5%
JDR-113	IRLO-AN-ANT1-3	962.8	219.1	22.8%	56.37	25.7%
JET-764	IRLO-AN-ANT2-1	638.2	134.6	21.1%	39.17	29.1%
JET-765	IRLO-AN-ANT2-2	733.3	158.3	21.6%	42.01	26.5%
JIV-542	IRLO-AN-ANT2-3	1076.9	225.9	21.0%	65.00	28.8%
JDR-128	IRLO-AN-ANT3-1	716.6	149.4	20.8%	38.19	25.6%
JET-762	IRLO-AN-ANT3-2	799.45	177.2	22.2%	38.81	21.9%
JET-763	IRLO-AN-ANT3-3	789.0	175.6	22.3%	44.22	25.2%
JET-768	IRLO-AS-AST1-1	500.13	113.6	22.7%	28.07	24.7%
JET-769	IRLO-AS-AST1-2	584.68	125.4	21.4%	32.90	26.2%
JET-770	IRLO-AS-AST1-3	539.68	118.4	21.9%	35.20	29.7%
JIV-545	IRLO-AS-AST2-1	554.09	118.4	21.4%	35.72	30.2%
JIV-546	IRLO-AS-AST2-2	524.08	123.1	23.5%	32.46	26.4%
JIV-547	IRLO-AS-AST2-3	668.8	132.2	19.8%	30.72	23.2%
JDR-171	IRLO-AS-AST3-1	936.1	208.5	22.3%	43.9	21.1%
JET-766	IRLO-AS-AST3-2	796.5	188.5	23.7%	38.31	20.3%
JET-767	IRLO-AS-AST3-3	993.8	217.8	21.9%	36.21	16.6%
JIV-536	IRLO-CN-CT1-1	507.0	112.5	22.2%	22.19	19.7%
JIV-537	IRLO-CN-CT1-2	779.9	155.6	20.0%	51.31	33.0%
JIV-538	IRLO-CN-CT1-3	478.21	101.8	21.3%	28.03	27.5%
JET-748	IRLO-CN-CT2-1	787.0	167.0	21.2%	48.85	29.3%
JET-747	IRLO-CN-CT2-2	610.4	133.6	21.9%	36.49	27.3%
JET-750	IRLO-CN-CT2-3	820.0	166.6	20.3%	35.18	21.1%
JDQ-999	IRLO-CN-CT3-1	483.81	93.9	19.4%	24.56	26.2%
JET-746	IRLO-CN-CT3-2	799.0	164.8	20.6%	34.98	21.2%
JET-749	IRLO-CN-CT3-3	724.4	151.1	20.9%	35.43	23.4%
JDR-039	IRLO-LS-LT1-1	498.0	105.6	21.2%	17.17	16.3%
JDR-040	IRLO-LS-LT1-2	448.49	94.8	21.1%	15.49	16.3%
JDR-041	IRLO-LS-LT1-3	806.0	152.0	18.9%	38.43	25.3%
JDR-035	IRLO-LS-LT2-1	547.48	126.5	23.1%	28.82	22.8%
JDR-036	IRLO-LS-LT2-2	518.71	125.2	24.1%	24.85	19.8%
JDR-037	IRLO-LS-LT2-3	474.0	107	22.6%	32.95	30.8%
JDR-042	IRLO-LS-LT3-1	823.6	173.6	21.1%	37.00	21.3%
JET-755	IRLO-LS-LT3-3	1030.4	186.5	18.1%	43.58	23.4%
JDR-085	IRLO-ML-MT1-1	744.1	174.3	23.4%	38.01	21.8%
JET-757	IRLO-ML-MT1-2	737.5	155.5	21.1%	40.37	26.0%
JET-758	IRLO-ML-MT1-3	447.37	95.5	21.3%	23.50	24.6%
JIV-541	IRLO-ML-MT2-1	727.8	168.9	23.2%	44.00	26.1%

Sample ID#	Location	Wet Weight (g)	Dry Weight (g)	Dry/Wet	Ash Weight (g)	Ash/Dry
JDR-068	IRLO-ML-MT2-2	433.0	100.5	23.2%	24.68	24.6%
JDR-069	IRLO-ML-MT2-3	447.79	94.4	21.1%	23.91	25.3%
JET-760	IRLO-ML-MT3-1	820.8	145.6	17.7%	34.02	23.4%
JIV-539	IRLO-ML-MT3-2	766.7	158.8	20.7%	30.81	19.4%
JIV-540	IRLO-ML-MT3-3	887.4	158.3	17.8%	34.89	22.0%
JDR-107	OCTP-AN-AN2M-1	1517.8	299.9	19.8%	27.14	9.0%
JDQ-978	OCTP-CN-C2M-1	1374.2	280.4	20.4%	31.76	11.3%
JDR-021	OCTP-LS-L2M-1	6882.0	965.6	14.0%	186.16	19.3%
JDR-064	OCTP-ML-M2M-1	658.8	139.69	21.2%	15.35	11.0%
JDR-130	PCOD-AN-AN2M-1	5034.0	1034.94	20.6%	179.2	17.3%
JDR-173	PCOD-AS-AS2M-1	5514.1	1102.12	20.0%	198.75	18.0%
JDR-001	PCOD-CN-C2M-1	5106.53	1115.28	21.8%	170.06	15.2%
JDR-044	PCOD-LS-L2M-1	5019.89	1008.8	20.1%	156.15	15.5%
JDR-087	PCOD-ML-M2M-1	5116.53	967.59	18.9%	179.32	18.5%
JDR-108	ROCK-AN-ANT1-1	1328.5	359.1	27.0%	43.58	12.1%
JDR-111	ROCK-AN-ANT2-1	2479.6	678.63	27.4%	106.83	15.7%
JDR-112	ROCK-AN-ANT2-2	1704.4	417.08	24.5%	80.67	19.3%
JDR-114	ROCK-AN-ANT3-1	1044.91	293.25	28.1%	43.61	14.9%
JDR-115	ROCK-AN-ANT3-2	1171.3	303.62	25.9%	40.52	13.3%
JDR-116	ROCK-AN-ANT3-3	587.76	149.73	25.5%	25.85	17.3%
JDR-151	ROCK-AS-AST1-1	525.14	146.07	27.8%	21.08	14.4%
JDR-152	ROCK-AS-AST1-2	840.6	224.36	26.7%	43.73	19.5%
JDR-153	ROCK-AS-AST1-3	1592.6	369.9	23.2%	56.48	15.3%
JDR-154	ROCK-AS-AST2-1	815.7	212.69	26.1%	35.27	16.6%
JDR-155	ROCK-AS-AST2-2	1233.9	332.2	26.9%	44.05	13.3%
JDR-156	ROCK-AS-AST2-3	968.4	250.95	25.9%	43.46	17.3%
JDR-157	ROCK-AS-AST3-1	775.2	189.07	24.4%	34.46	18.2%
JDR-158	ROCK-AS-AST3-2	530.0	125.0	23.6%	22.43	17.9%
JDR-159	ROCK-AS-AST3-3	1260.0	290.35	23.0%	61.77	21.3%
JDR-160	ROCK-AS-DUP	1501.78	383.6	25.5%	65.53	17.1%
JDQ-979	ROCK-CN-CT1-1	842.7	213.3	25.3%	41.23	19.3%
JDQ-980	ROCK-CN-CT1-2	1161.2	301.09	25.9%	48.46	16.1%
JDQ-981	ROCK-CN-CT1-3	991.1	246.64	24.9%	44.85	18.2%
JDQ-982	ROCK-CN-CT2-1	1181.4	334.51	28.3%	38.43	11.5%
JDQ-983	ROCK-CN-CT2-2	953.8	260.54	27.3%	40.61	15.6%
JDQ-984	ROCK-CN-CT2-3	1000.8	244.66	24.4%	29.99	12.3%
JDQ-985	ROCK-CN-CT3-1	1103.5	258.39	23.4%	51.10	19.8%
JDQ-986	ROCK-CN-CT3-2	1203	313.09	26.0%	39.34	12.6%

Sample ID#	Location	Wet Weight (g)	Dry Weight (g)	Dry/Wet	Ash Weight (g)	Ash/Dry
JDQ-987	ROCK-CN-CT3-3	878.5	210.2	23.9%	39.68	18.9%
JDQ-988	ROCK-CN-DUP	868.7	216.29	24.9%	29.54	13.7%
JDR-031	ROCK-LS-DUP	976.1	250.3	25.6%	31.25	12.5%
JDR-027	ROCK-LS-DUP2	1083.3	253.15	23.4%	37.60	14.9%
JDR-022	ROCK-LS-LT1-1	556.6	119.86	21.5%	25.79	21.5%
JDR-023	ROCK-LS-LT1-2	868.7	210.3	24.2%	38.41	18.3%
JDR-024	ROCK-LS-LT1-3	944.3	228.8	24.2%	41.13	18.0%
JDR-025	ROCK-LS-LT2-1	996.9	248.56	24.9%	35.19	14.2%
JDR-026	ROCK-LS-LT2-2	855.8	216.86	25.3%	37.61	17.3%
JDR-028	ROCK-LS-LT3-1	1352.3	303.19	22.4%	81.83	27.0%
JET-754	ROCK-LS-LT3-1	977.1	222.01	22.7%	30.79	13.9%
JDR-029	ROCK-LS-LT3-2	1128.32	265.97	23.6%	45.84	17.2%
JDR-030	ROCK-LS-LT3-3	1094.3	317.17	29.0%	41.75	13.2%
JET-759	ROCK-ML-DUP	881.6	199.42	22.6%	40.37	20.2%
JDR-065	ROCK-ML-MT1-1	1114.8	253.26	22.7%	33.88	13.4%
JDR-066	ROCK-ML-MT1-2	765.5	174.4	22.8%	27.97	16.0%
JDR-067	ROCK-ML-MT1-3	922.8	218.00	23.6%	38.43	17.6%
JIV-555	ROCK-ML-MT2-1	846.3	225.49	26.6%	43.15	19.1%
JIV-556	ROCK-ML-MT2-2	763.2	188.61	24.7%	35.47	18.8%
JDR-070	ROCK-ML-MT2-3	837.5	185.9	22.2%	41.03	22.1%
JDR-071	ROCK-ML-MT3-1	734.7	155.69	21.2%	37.10	23.8%
JDR-072	ROCK-ML-MT3-2	1290.0	358.47	27.8%	56.70	15.8%
JDR-073	ROCK-ML-MT3-3	1322.0	568.13	43.0%	80.81	14.2%
JET-741	SEDI-LS-LT1-1	860.9	704.8	81.9%	697.54	99.0%
JET-742	SEDI-ML-MT1-1	817.1	526.47	64.4%	504.62	95.8%
JDQ-904	SOIL-AD-XXX-1	230.55	89.29	38.7%	65.42	73.3%
JDQ-905	SOIL-AD-XXX-2	304.33	144.94	47.6%	32.71	22.6%
JDQ-906	SOIL-AD-XXX-3	176.1	26.38	15.0%	7.40	28.1%
JDQ-903	SOIL-AI-CT1-3	365.32	123.35	33.8%	85.10	69.0%
JDQ-902	SOIL-AI-LT1-2	496.06	61.81	12.5%	45.44	73.5%
JDQ-901	SOIL-AI-ML-1	1085.6	739.06	68.1%	584.31	79.1%
JDQ-897	STRL-AD-XXX-1	660.18	340.82	51.6%	9.84	6.7%
JDQ-899	STRL-AD-XXX-2	703.76	290.34	21.0%	13.28	9.1%
JDQ-900	STRL-AD-XXX-3	611.64	389.92	30.3%	16.36	11.2%
JDQ-898	STRL-AI-CT1-1	443.88	283.5	63.9%	34.9	23.8%
JDQ-896	STRL-AI-LT1-2	677.57	228.92	33.8%	3.54	2.4%
JDQ-895	STRL-AI-ML-1	510.77	146.51	28.7%	2.28	1.6%
JDR-104	URCH-AN-ANT1-1	763.7	224.12	29.3%	166.64	74.4%

Sample ID#	Location	Wet Weight (g)	Dry Weight (g)	Dry/Wet	Ash Weight (g)	Ash/Dry
JDR-105	URCH-AN-ANT2-1	**754.8**	**207.2**	**27.5%**	**160.68**	**77.5%**
JDR-106	URCH-AN-ANT3-1	**720.1**	**189.43**	**26.3%**	**142.38**	**75.2%**
JDR-147	URCH-AS-AST1-1	**577.99**	**152.17**	**26.3%**	**121.39**	**79.8%**
JDR-148	URCH-AS-AST2-1	**479.6**	**118.8**	**24.8%**	**86.18**	**72.5%**
JDR-149	URCH-AS-AST3-1	**537.38**	**143.91**	**26.8%**	**111.06**	**77.2%**
JDQ-975	URCH-CN-CT1-1	**737.5**	**183.81**	**24.9%**	**143.79**	**78.2%**
JDQ-976	URCH-CN-CT2-1	**534.9**	**156.1**	**29.2%**	**112.91**	**72.3%**
JDQ-977	URCH-CN-CT3-1	**718.1**	**187.47**	**26.1%**	**146.08**	**77.9%**
JDR-018	URCH-LS-LT1-1	**641.2**	**164.14**	**25.6%**	**126.11**	**76.8%**
JDR-019	URCH-LS-LT2-1	**567.4**	**147.68**	**26.0%**	**115.11**	**77.9%**
JDR-020	URCH-LS-LT3-1	**624.4**	**160.3**	**25.7%**	**123.08**	**76.8%**
JDR-061	URCH-ML-MT1-1	**795.0**	**214.3**	**27.0%**	**171.39**	**80.0%**
JDR-062	URCH-ML-MT2-1	**686.25**	**183.75**	**26.8%**	**144.13**	**78.4%**
JDR-063	URCH-ML-MT3-1	**562.49**	**141.69**	**25.2%**	**109.75**	**77.5%**

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Appendix F

Laboratory Quality Assurance and Data Validation Procedures

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F.1 Cesium-137 Isotope

The beta-spectrometry system was calibrated using stock solutions of ^{137}Cs prepared by serial dilution of a Standard Reference Material 4233D supplied by NIST. Data validation procedures included the analysis of archive water samples obtained under the DOE Mixed Analyte Performance Evaluation Program (MAPEP) and are shown in Table F1. The average measurement bias across three test water samples each measured in triplicate was –3.4 percent. All performance test measurements easily satisfied the MAPEP acceptance range test criteria.

Table F1. Beta Spectrometric Measurements of Cesium Isotope Activity in MAPEP Performance Test Samples

Sample ID	Test Cs Isotope Activity Level[a] (pCi)	Cs Isotopes Present	Measured Cs Isotope Activity Level (pCi)	Reference Value[a] (pCi L^{-1})	Measured Value (pCi L^{-1})	MAPEP Acceptance Range[a] (pCi L^{-1})	Test	Bias
MAPEPW22_01	46.5	^{137}Cs	44.1 ± 1.6	1551	1432 ± 53	1095-2016	PASS	–7.7%
MAPEPW22_02	46.5	^{137}Cs	45.8 ± 1.7	1551	1485 ± 55	1095-2016	PASS	–4.2%
MAPEPW22_03	46.5	^{137}Cs	48.5 ± 1.8	1551	1572 ± 58	1095-2016	PASS	1.4%
MAPEPW23_01	47.2	$^{137}Cs/^{134}Cs$	46.4 ± 1.8	1573	1505 ± 57	1118-2059	PASS	–4.4%
MAPEPW23_02	47.2	$^{137}Cs/^{134}Cs$	46.5 ± 1.8	1573	1508 ± 57	1118-2059	PASS	–4.2%
MAPEPW23_03	47.2	$^{137}Cs/^{134}Cs$	46.1 ± 1.7	1573	1495 ± 57	1118-2059	PASS	–5.0%
MAPEPW24_02	33.3	$^{137}Cs/^{134}Cs$	34.1 ± 1.4	1111	1107 ± 44	797-1464	PASS	–0.4%
MAPEPW24_02	33.3	$^{137}Cs/^{134}Cs$	32.4 ± 1.3	1111	1051 ± 42	797-1464	PASS	–5.4%
MAPEPW24_03	33.3	$^{137}Cs/^{134}Cs$	34.2 ± 1.4	1111	1108 ± 44	797-1464	PASS	–0.3%

[a] Decay corrected to count date.

The analyte detection and quantification capabilities of the ^{137}Cs measurements based on beta spectrometry were assessed using a graphical technique (Habaux and Vos 1970). A 6-point calibration curve was prepared in triplicate using sub-aliquots of MAPEPW22. Test levels ranged in activity between 0 and 47 pCi. The response curve yielded a straight-line calibration (r^2= 0.9999) with a zero point intercept of −0.07 pCi and an estimated MDA of 0.65 pCi. For the purpose of this study, measurement MDAs for individual samples are expressed as activity concentrations (or the MDC [minimum detectable concentration]) in units of picocuries per kilogram wet weight, to account for variances in sample mass and analyte recovery.

During the data validation process, the purified beta spectrometry sources were pooled according to species type and counted by high-resolution gamma-spectrometry. These semiquantitative measurements were performed as a precautionary measure to check for the presence of ^{134}Cs (half-life = 2.05 years) beta activity fallout originating from the Fukushima Dai-Ichi nuclear facility in Japan following the earthquake and tsunami on March 11, 2011. These measurements clearly identified the presence of ^{134}Cs in Dolly Varden and pooled samples of rockweed. Trace quantities of ^{134}Cs were also observed in pooled samples of Irish lord. In view of these findings, the associated measurement data for Dolly Varden, rockweed, and Irish lord were posted with a data qualifier indicating the presence of a known interference (Hamilton et al. 2012b). Because the Amchitka 2011 sampling event occurred soon after the Fukushima nuclear accident, all the reported ^{137}Cs beta spectrometry measurements may be variously affected by the same data qualifier and should therefore only be used as a conservative measure of ^{137}Cs activity concentrations for input into associated human health and ecological assessment models. By

analogy, a conservative estimate of the activity concentration of ^{134}Cs in fauna for the 2011 sampling event could be made by assuming the cesium isotope activity observed at the time of the sampling was dominated by a Fukushima source-term, that is, $^{134}Cs/^{137}Cs$ activity ratio ≈1, and multiplying the reported ^{137}Cs activity concentration by an isotope ratio-decay factor (assuming the time between sampling and the original analysis date was approximately 12 months) equal to the reported activity concentration of ^{137}Cs (0.59 pCi kg^{-1}).

F.2 Americium-241 Isotope

A conservative estimate of the MDA was calculated based on a Stapleton approximation (adopted from MARLAP 2004) by using the mean background count rate for the alpha spectrometry system rather than a mean blank count rate. This approximation was made because a series of 10 replicate blank measurements all returned a zero count rate in the specific region of interest for ^{241}Am. With this assumption, the largest number of ^{241}Am counts likely to be observed in a background count was 2, yielding an estimated MDA for measurement of ^{241}Am by alpha spectrometry of 0.01 pCi. For the purposes of this report, measurement MDAs for individual samples are expressed as activity concentrations (or the MDC) in units of picocuries per kilogram wet weight, to account for the variances in the sample mass and analyte recovery. The vast majority of samples analyzed for the 2011 sampling event contained ^{241}Am levels that were at or below the MDA. Where time permitted, the counting times for source plates were extended to improve on the minimum quantifiable values; nonetheless, in many cases this still proved to be inadequate in providing a reasonable level of measurement precision. The reproducibility of the per-kilogram counts on source plates was assessed using a small number of cross counts on different detectors. The cross counts satisfied internal laboratory quality requirements with a mean measurement bias (N = 8) of 28 percent compared with an average individual sample measurement uncertainty (±1 sigma [σ]) for the same source plates of 24 percent. By excluding duplicate counts on one outlier source plate (No. 6) containing ^{241}Am levels at or below the reported MDAs, the mean bias between cross counts is further improved to 16.1 percent, as shown in Table F2.

Table F2. Cross-Count Data for Determination of ^{241}Am by Alpha Spectrometry

No	Location	^{241}Am pCi kg^{-1} Wet	%CV	MDA
1	CHIT-CN-CT2-1	0.066 ± 0.010	3	0.003
		0.071 ± 0.013		0.004
2	URCH-CN-CT2-1	0.13 ± 0.02	12	0.004
		0.10 ± 0.04		0.01
3	OCTP-CN-C2M-1	0.015 ± 0.005	8	0.003
		0.017 ± 0.005		0.003
4	ROCK-CN-CT2-3	0.007 ± 0.006	26	0.007
		0.004 ± 0.003		0.003
5	CHIT-AN-ANT1-1	0.066 ± 0.005	9	0.002
		0.079 ± 0.012		0.003
6	ROCK-AS-AST1-1	–0.001 ± 0.001	116	0.008
		0.013 ± 0.007		0.007
7	PCOD-AS-AS2M-1	0.002 ± 0.001	38	0.001
		0.001 ± 0.001		0.001
8	IRLO-ML-MT1-3	0.010 ± 0.008	13	0.009
		0.012 ± 0.007		0.007
		Average %CV	**28.4 (16.1)%**	

CV = coefficient of variation

F3 Plutonium Isotopes

The minimal detectable signal of the ICP-MS instrument for plutonium isotope measurements was estimated in a fashion similar to that described for uranium isotopes using procedures adopted from MARLAP (2004). Based on the standard deviation of 10 reported replicate blank measurements, the MDA defined by units of activity for measurement of ^{239}Pu and ^{240}Pu by ICP-MS is estimated to be around 0.03 and 0.02 pCi, respectively. For the purpose of this study, measurement MDAs for individual samples are expressed as activity concentrations (or the MDC) in units of picocuries per kilogram wet weight, to account for the variances in the sample mass.

Mass bias and concentration performance test measurements were performed using certified reference materials (CRMs) traceable to the NIST, namely CRM 128 containing a ^{239}Pu/^{242}Pu atom ratio of 0.9989, and CRM 138 containing a ^{240}Pu/^{239}Pu atom ratio of 0.2409. Each of these materials was originally certified as a primary isotopic ratio standard, but as the material was diluted to a known volume, they are subsequently also used in LLNL as laboratory concentration control standards. The performance tests samples as analyzed were prepared in the sub-nanogram concentration range to mimic expected activity concentrations in the Amchitka samples. Table F3 shows the average ^{239}Pu/^{240}Pu bias on six replicates measurements of test solutions of CRM 138 containing 0.004 nanogram per gram ng g^{-1} (0.24 pCi g^{-1}) ^{239}Pu and 0.00034 ng/g (0.08 pCi g^{-1}) ^{240}Pu was –0.6 percent. Table F4 shows the replicate analyses (N=10) of test solutions of CRM 128 containing 0.25 ng (or 16 pCi) of ^{239}Pu also met laboratory performance criteria for accuracy and precision. In this example, the mean measurement bias as reported for the ^{239}Pu concentration in the stock solution was 4.5 percent but satisfies laboratory performance acceptance criteria by falling within 3 σ of the mean individual measurement uncertainty or ± 5.3 percent.

In Table F5, a series of nonrandom Amchitka samples (N=48) were selected to run in duplicate on separate ICP-MS runs to assess the effects of run variability on the precision and accuracy of the plutonium isotopic measurements (Table F4). There were two considerations given to selection of the samples (1) a reasonable cross section of samples based on the different vegetation and fauna species, and (2) a reasonable selection of samples where the initial measurement provided quantifiable data for either ^{239}Pu or ^{240}Pu, or both. The criteria applied for inclusion of the duplicate data in the statistical summary was also selective. In this case, only those duplicate measures in which the individual measurements exceeded the Critical Concentration (defined by half the reported MDC, or MDC/2) were included (N=25). Otherwise, the results of both measurements are shown as an MDA with no uncertainty.

Table F3. Mass Bias Performance Test Measurements of Plutonium Isotopes in Certified reference Material CRM 138 Based on ICP-MS Detection

Sample	^{240}Pu/^{239}Pu Mass Ratio	Bias
CRM138 #1	0.084 ± 0.002	–2.2%
CRM138#2	0.086 ± 0.001	0.1%
CRM138#3	0.086 ± 0.002	0.3%
CRM138#4	0.086 ± 0.002	0.5%
CRM138#5	0.087 ± 0.002	0.9%
CRM138 #6	0.083 ± 0.002	–3.2%
Measured Mean Value	**0.0854 ± 0.0014**	**–0.6%**
Reference Value	**0.0859 ± 0.0001**	

Table F4. Concentration Performance Test Measurement of ^{239}Pu Isotopes in Certified Reference Material CRM 128 Based on ICP-MS Detection

Sample	^{239}Pu ng g^{-1}	Bias
CRM128 #1	27.5 ± 0.4	5.8%
CRM128 #2	27.5 ± 0.3	5.7%
CRM128 #3	27.3 ± 0.4	5.3%
CRM128 #4	27.5 ± 0.7	5.9%
CRM128 #5	26.8 ± 0.5	3.3%
CRM128 #6	27.1 ± 0.4	4.5%
CRM128 #7	27.1 ± 0.3	4.4%
CRM128 #8	26.8 ± 0.3	3.4%
CRM128 #9	26.8 ± 0.6	3.1%
CRM128 #10	27.0 ± 0.8	3.9%
Measured Mean Value	**27.1 ± 0.3**	**4.5%**
Reference Value	**25.96**	

Table F5. Replicate Measurements of Plutonium Isotopes Based on ICP-MS

No.	Ticket Number	^{239}Pu, pCi kg^{-1} Wet		^{240}Pu, pCi kg^{-1} Wet		^{240}Pu/^{239}Pu atom ratio	
		Value	%CV	Value	%CV	Value	%CV
1	CHIT-AS-AST3-1	0.056 ± 0.004	2.3	0.03	-	-	-
		0.054 ± 0.004		0.03		-	
2	CHIT-CN-CT1-1	0.06	-	0.04	-	-	-
		0.06		0.04		-	
3	CHIT-CN-CT2-1	0.052 ± 0.006	12	0.03	-	-	-
		0.066 ± 0.005		0.03		-	
4	CHIT-CN-CT3-1	0.07	-	0.04	-	-	-
		0.07		0.04		-	
5	CHIT-LS-LT2-1	0.031 ± 0.001	21	0.03	-	-	-
		0.021 ± 0.004		0.03		-	
6	DOLL-AI-XXX-1	0.01	-	0.01	-	-	-
		0.01		0.01		-	
7	EUAL-AN-ANT-1	0.051 ± 0.001	2.5	0.040 ± 0.001	5.3	0.21 ± 0.01	2.9
		0.048 ± 0.004		0.036 ± 0.002		0.20 ± 0.03	
8	EUAL-AS-AST3-1	0.100 ± 0.001	2.0	0.081 ± 0.002	2.5	0.22 ± 0.01	0.5
		0.104 ± 0.002		0.085 ± 0.003		0.22 ± 0.02	
9	EUAL-AS-AST3-3	0.104 ± 0.001	2.3	0.086 ± 0.002	0.5	0.23 ± 0.01	-
		0.108 ± 0.001		0.085 ± 0.004		0.22 ± 0.02	
10	EUAL-CN-CT1-1	0.074 ± 0.001	1.0	0.061 ± 0.002	3.3	0.23 ± 0.01	4.2
		0.075 ± 0.004		0.057 ± 0.001		0.21 ± 0.01	
11	EUAL-CN-CT1-2	0.0113 ± 0.0003	8.1	0.007 ± 0.001	0.0	0.18 ± 0.05	8.1
		0.0133 ± 0.0005		0.007 ± 0.001		0.15 ± 0.05	
12	EUAL-CN-CT2-3	0.061 ± 0.001	0.7	0.052 ± 0.002	0.8	0.23 ± 0.02	0.2
		0.060 ± 0.001		0.051 ± 0.002		0.23 ± 0.02	
13	EUAL-LS-LT1-1	0.064 ± 0.001	0.7	0.051 ± 0.002	0.0	0.22 ± 0.02	0.7
		0.065 ± 0.004		0.051 ± 0.003		0.22 ± 0.02	
14	EUAL-LS-LT1-2	0.005	-	0.003	-	-	-
		0.005		0.003		-	
15	EUAL-ML-MT1-3	0.094 ± 0.001	0.8	0.078 ± 0.002	0.0	0.23 ± 0.01	0.8
		0.096 ± 0.004		0.078 ± 0.002		0.23 ± 0.01	
16	EAUL-ML-MT2-1	0.116 ± 0.001	0.3	0.096 ± 0.003	1.0	0.23 ± 0.01	1.4
		0.117 ± 0.001		0.094 ± 0.004		0.22 ± 0.02	
17	EAUL-ML-MT2-2	0.100 ± 0.001	0.0	0.085 ± 0.002	2.8	0.23 ± 0.01	2.8
		0.100 ± 0.001		0.081 ± 0.003		0.22 ± 0.02	
18	EUAL-ML-MT3-2	0.0351 ± 0.0004	1.6	0.026 ± 0.001	3.4	0.20 ± 0.02	1.9
		0.036 ± 0.001		0.028 ± 0.002		0.21 ± 0.03	
19	FUCU-AN-ANT1-1	0.0190 ± 0.0003	22	0.011 ± 0.001	0.0	0.15 ± 0.03	22
		0.012 ± 0.001		0.011 ± 0.001		0.24 ± 0.06	
20	FUCU-AN-ANT2-3	0.006	-	0.003	-	-	-
		0.006		0.003		-	
21	FUCU-AN-ANT3-1	0.006	-	0.003	-	-	-
		0.006		0.003		-	
22	FUCU-AS-AST3-1	0.006	-	0.003	-	-	-
		0.006		0.003		-	
23	FUCU-CN-CT2-2	0.006	-	0.003	-	-	-
		0.006		0.003		-	
24	FUCU-LS-LT1-1	0.006	-	0.003	-	-	-
		0.006		0.003		-	

Table F5 (continued). Replicate Measurements of Plutonium Isotopes Based on ICP-MS

No.	Ticket Number	^{239}Pu, pCi kg^{-1} Wet		^{240}Pu, pCi kg^{-1} Wet		^{240}Pu/^{239}Pu atom ratio	
		Value	%CV	Value	%CV	Value	%CV
25	FUCU-LS-LT2-1	0.05	-	0.03	-	-	-
		0.05		0.03		-	
26	GREN-CN-CT3-1	0.05	-	0.03	-	-	-
		0.05		0.03		-	
27	GREN-CN-CT3-2	0.05	-	0.02	-	-	-
		0.05		0.02		-	
28	GREN-LS-LT3-1	0.04	-	0.02	-	-	-
		0.04		0.02		-	
29	GWGU-AI-XXX-1	0.04	-	0.02	-	-	-
		0.04		0.02		-	
30	HALI-CN-C2M-1	0.005	-	0.003	-	-	-
		0.005		0.003		-	
31	HALI-LS-L2M-1	0.006	-	0.003	-	-	-
		0.006		0.003		-	
32	HMUS-AN-ANT1-1	0.073 ± 0.005	17	0.08	-	-	-
		0.052 ± 0.008		0.08		-	
33	HMUS-ML-MT1-1	0.114 ± 0.0006	1.7	0.10	-	-	-
		0.110 ± 0.0006		0.10		-	
34	IRLO-AS-AST2-3	0.05	-	0.03	-	-	-
		0.05		0.03		-	
35	IRLO-LS-LT2-3	0.07	-	0.04	-	-	-
		0.07		0.04		-	
36	OCTP-AN-AN2M-1	0.02	-	0.01	-	-	-
		0.02		0.01		-	
37	OCTP-CN-C2M-1	0.031 ± 0.002	5.5	0.01	-	-	-
		0.027 ± 0.003		0.01		-	
38	OCTP-ML-M2M-1	0.027 ± 0.004	8.0	0.03	-	-	-
		0.023 ± 0.003		0.03		-	
39	PCOD-AN-AN2M-1	0.006	-	0.003	-	-	-
		0.006		0.003		-	
40	STRL-AD-XXX-3	0.237 ± 0.004	3.6	0.13 ± 0.01	6.7	0.16 ± 0.03	3.0
		0.255 ± 0.005		0.15 ± 0.02		0.17 ± 0.04	
41	URCH-AN-ANT2-1	0.04	-	0.02	-	-	-
		0.04		0.02		-	
42	URCH-CN-CT1-1	0.090 ± 0.002	12.2	0.065 ± 0.006	10.5	0.20 ± 0.04	1.7
		0.070 ± 0.003		0.053 ± 0.006		0.20 ± 0.05	
43	URCH-CN-CT2-1	0.006	-	0.003	-	-	-
		0.006		0.003		-	
44	URCH-CN-CT3-1	0.033 ± 0.002	28	0.02	-	-	-
		0.019 ± 0.005		0.02		-	
45	URCH-LS-LT1-1	0.130 ± 0.005	21.7	0.03	-	-	-
		0.084 ± 0.003		0.03		-	
46	URCH-LS-LT3-1	0.05	-	0.03	-	-	-
		0.05		0.03		-	
47	URCH-ML-MT1-1	0.102 ± 0.002	18	0.02	-	-	-
		0.071 ± 0.003		0.02		-	
48	URCH-ML-MT2-1	0.149 ± 0.005	8.2	0.03	-	-	-
		0.126 ± 0.002		0.03		-	
		Average CV	**8.0%**		**2.6%**		**3.8%**

The mean CVs obtained on duplicate measurements of ^{239}Pu, ^{240}Pu, and $^{240}Pu/^{239}Pu$ atom ratios meeting this criterion were 8.0, 2.6, and 3.8 percent, respectively. The mean individual measurement uncertainty for each measure at the 1 σ level was 3.2, 5.2, and 12 percent, respectively. The duplicate measurements were therefore within acceptable data quality performance criteria based on a 3 sigma rule. Under the reporting criterion given above, the plutonium isotope measurements performed for this sampling event based on ICP-MS appear to satisfy internal laboratory performance requirements for precision, accuracy, and quantification capability. In addition, individual data are provided (Appendix E, taken from Hamilton et al. 2012c) in which quantifiable data were obtained with a reasonable level of precision even if these values fall below the reported MDA. In this example, the duplicate measurements provide some evidence that quantifiable plutonium isotope data falling at or below the measurement MDA could be misleading, as a number of the initial measures showing quantifiable concentrations of the analyte could not be replicated in the subsequent analysis, supporting the use of the reported MDA value in any decision-making rule or assessment. This was especially true of measurements of ^{239}Pu in rockweed, where many reported results fall below the MDA of 0.006 pCi kg^{-1} wet weight.

F4 Uranium Isotopes

The minimal detectable signal of the ICP-MS instrument for uranium isotope measurements was defined by the standard deviation (σ 0) of 10 reported replicate blank measurements based on a noncentral t distribution function, and assuming the variance of the signal between measurements was approximately constant (using procedures adopted from MARLAP 2004). The MDA defined by units of activity for measurement of ^{234}U, ^{235}U, (^{236}U), and ^{238}U by ICP-MS is estimated to be around 0.007, 2×10^{-6}, 3×10^{-5}, and 1×10^{-5} pCi, respectively. As a small, sub-aliquot of the sample was used for these measurements, the effective measurement MDA for each of the uranium isotopes is significantly high when accounting for the full mass of sample material as supplied. In this case, the mean effective MDA for measurement of ^{234}U, ^{235}U, (^{236}U), and ^{238}U in the suite of Amchitka samples was around 2.5, 0.0009, 0.02, and 0.004 pCi, respectively.

The achievable quantifiable limits of uranium detection and measurement using this direct aspiration method was therefore less than what was expected but still appear to have satisfied measurement quality objectives to provide uranium isotopic data with reasonable precision and accuracy. For example, the mean, standard deviation, minimum and maximum $^{235}U/^{238}U$ mass ratios observed across the whole sample analysis suite (N=310) excluding one outlier was 0.0072, 0.0001, 0.0064, and 0.0075, respectively. The expected $^{235}U/^{238}U$ mass ratio of naturally occurring uranium in the environment is 0.0072.

For the purpose of this study, measurement MDAs for individual samples are expressed as activity concentrations (or the MDC) in units of picocuries per kilogram wet weight to account for variances in the sample mass. In Table F6 and Table F7, mass bias and concentration performance test measurements were performed using a CRM traceable to the NIST, NBL CRM-129A, originally purchased from the Isotope Products Laboratories (now Eckert and Ziegler AG). The performance tests were performed at the nanogram total uranium level to mimic expected concentrations in samples. The mass fraction bias for ^{234}U, ^{235}U, and ^{238}U was 2.1, 0.7, and −0.01%, respectively, or well within the expected tolerance limits for environmental measurements.

Table F7 shows replicate analyses of the reference material and also shows that the accuracy and precision of the ICP-MS measurements satisfied laboratory performance measures with the mean measurement bias for ^{234}U, ^{235}U, and ^{238}U falling within 3 σ of the individual measurement uncertainty.

Table F6. Mass Bias Performance Test Measurement of Uranium Isotopes in Certified Reference Material CRM129A Based on ICP-MS Detection

Mass Fraction (x 100)	Reference Value	Measured Value	Bias
^{234}U	0.005208 ± 0.000004	0.00532 ± 0.00005	2.1%
^{235}U	0.71183 ± 0.0004	0.717 ± 0.0055	0.7%
^{236}U	0.0000096 ± 0.0000012	$<1 \times 10^{-4}$	–
^{238}U	99.2830 ± 0.0004	99.3 ± 0.92	–0.01%

Table F7. Concentration Performance Test Measurements of Uranium Isotopes in Certified Reference Material CRM 129A Based on ICP-MS Detection

Sample	^{234}U, ng	Bias	^{235}U, ng	Bias	^{238}U, ng	Bias
CRM129A #1	0.059 ± 0.002	3.5%	7.99 ± 0.06	2.6%	1107 ± 5	1.9%
CRM129A #2	0.0595 ± 0.0016	4.4%	7.99 ± 0.06	2.6%	1115 ± 7	2.6%
CRM129A #3	0.057 ± 0.002	3.5%	7.96 ± 0.08	2.2%	1109 ± 9	2.1%
CRM129A #4	0.06 ± 0.002	5.3%	7.96 ± 0.07	2.2%	1102 ± 8	1.4%
CRM129A #5	0.0585 ± 0.0012	2.7%	7.98 ± 0.08	2.4%	1108 ± 5	2.0%
CRM129A #6	0.059 ± 0.002	3.5%	7.95 ± 0.05	2.1%	1098 ± 6	1.1%
CRM129A #7	0.058 ± 0.002	1.8%	7.98 ± 0.05	2.4%	1101 ± 5	1.3%
CRM129A #8	0.0595 ± 0.0018	4.4%	7.97 ± 0.06	2.3%	1099 ± 5	1.2%
CRM129A #9	0.0609 ± 0.0008	6.9%	7.95 ± 0.07	2.1%	1095 ± 8	0.8%
CRM129A #10	0.0589 ± 0.0014	3.4%	7.88 ± 0.05	2.3%	1091 ± 3	0.4%
Measured Mean Value	**0.0590 ± 0.0011**	**3.6%**	**7.96 ± 0.032**	**2.2%**	**1103 ± 7**	**1.5%**
Reference Value	**0.0570**		**7.789**		**1086.4**	

A series of Amchitka samples were analyzed in duplicate (N=26) on separate ICP-MS runs to assess the effects of run variability on the precision and accuracy of the uranium isotopic measurements. F8shows the results. The relative difference in the two duplicate measurements can be expressed as a coefficient of variation (CV). The mean CVs obtained for duplicate measurements of ^{234}U, ^{235}U, and ^{238}U were 4.1 percent, 2.0 percent, and 1.6 percent, respectively. The CV values closely mirror typical individual sample measurement precision for the each of the uranium isotopes, and are therefore within acceptable laboratory quality performance criteria based on a 3 σ rule. The highest level of variability was observed for ^{234}U measurements (mean 4.1 percent, range 0–10.5 percent). Moreover, there is some evidence for a positive bias for ^{234}U measurements because $^{234}U/^{238}U$ activity ratios (not reported) on samples of marine origin consistently fall above the characteristic ratio of 1.14 observed in seawater.

Table F8. Replicate Measurements of Uranium Isotopes Based on ICP-MS

No.	Ticket Number	^{238}U, pCi kg^{-1} Wet		^{235}U, pCi kg^{-1} Wet		^{234}U, pCi kg^{-1} Wet	
		Value	%CV	Value	%CV	Value	%CV
1	FUCU-ML-MT1-1	79.9 ± 0.2	2.4	3.38 ± 0.01	3.7	96.7 ± 1.8	2.4
		76.1 ± 0.5		3.14 ± 0.04		92.2 ± 2.7	
2	FUCU-AS-DUP	95.2 ± 0.2	0.3	4.01 ± 0.02	0.0	115 ± 2	0.7
		95.7 ± 0.5		4.0 ± 0.1		116 ± 3	
3	HMUS-CN-CT1-1	20.2 ± 0.1	0.1	0.850 ± 0.0007	0.3	23.4 ± 1.2	1.9
		20.2 ± 0.1		0.856 ± 0.006		24.3 ± 1.2	
4	HMUS-CN-CT3-1	41.9 ± 0.3	0.9	1.78 ± 0.02	0.8	52.9 ± 2.1	2.6
		41.2 ± 0.2		1.75 ± 0.02		50.2 ± 1.1	
5	URCH-CN-CT1-1	16.3 ± 0.1	0.5	0.70 ± 0.01	0.0	24.6 ± 3.5	2.4
		16.4 ± 0.2		0.70 ± 0.04		23.4 ± 2.3	
6	ROCK-CN-CT1-2	3.3 ± 0.1	0.3	0.143 ± 0.003	1.6	4.8 ± 0.6	2.7
		3.31 ± 0.02		0.139 ± 0.004		4.6 ± 0.6	
7	GREN-CN-CT1-2	5.7 ± 0.1	5.4	0.247 ± 0.004	6.7	7.2 ± 0.8	0.1
		5.1 ± 0.1		0.216 ± 0.005		7.2 ± 0.8	
8	IRLO-LS-LT1-3	4.20 ± 0.01	0.1	0.179 ± 0.003	0.1	5.3 ± 0.8	4.6
		4.21 ± 0.03		0.178 ± 0.002		5.8 ± 0.9	
9	EUAL-ML-MT2-3	18.09 ± 0.04	1.2	0.770 ± 0.01	0.4	21.9 ± 0.6	0.0
		18.5 ± 0.2		0.78 ± 0.04		21.8 ± 1.1	
10	HMUS-ML-MT2-1	34.5 ± 0.1	0.0	1.46 ± 0.01	0.5	40.1 ± 0.8	3.6
		34.5 ± 0.4		1.44 ± 0.02		43.1 ± 3.3	
11	ROCK-ML-MT1-3	7.96 ± 0.04	0.7	0.340 ± 0.003	0.7	10.2 ± 1.0	4.2
		8.1 ± 0.1		0.345 ± 0.006		9.4 ± 1.4	
12	GREN-ML-MT3-1	8.4 ± 0.1	3.1	0.364 ± 0.006	4.5	11.4 ± 1.8	5.1
		7.9 ± 0.1		0.333 ± 0.007		10.3 ± 0.8	
13	PCOD-AN-AN2M-1	1.18 ± 0.01	0.3	0.050 ± 0.001	0.1	1.9 ± 0.5	10.7
		1.19 ± 0.02		0.051 ± 0.001		1.5 ± 0.6	
14	EUAL-AS-AST1-2	15.1 ± 0.1	0.0	0.638 ± 0.005	0.4	17.8 ± 1.2	4.2
		15.1 ± 0.1		0.643 ± 0.007		19.4 ± 0.7	
15	EUAL-AS-AST2-1	13.1 ± 0.2	0.0	0.56 ± 0.01	0.4	15.3 ± 1.0	3.2
		13.1 ± 0.1		0.557 ± 0.008		16.3 ± 0.7	
16	EUAL-AS-AST3-1	20.89 ± 0.03	0.2	0.882 ± 0.006	0.5	27.0 ± 1.2	2.4
		21.0 ± 0.1		0.89 ± 0.01		25.7 ± 1.1	
17	CHIT-AS-AST2-1	3.60 ± 0.02	0.7	0.153 ± 0.002	1.3	5.1 ± 1.9	4.0
		3.7 ± 0.1		0.156 ± 0.005		4.7 ± 1.4	
18	URCH-AS-AST2-1	19.3 ± 0.2	0.8	0.83 ± 0.01	0.2	26.0 ± 2.0	3.5
		19.6 ± 0.2		0.83 ± 0.01		24.2 ± 2.3	
19	GREN-AS-AST1-2	2.91 ± 0.02	0.2	0.123 ± 0.002	0.7	3.9 ± 0.6	10.5
		2.92 ± 0.01		0.125 ± 0.001		3.1 ± 0.7	
20	GREN-AS-AST3-1	2.15 ± 0.04	0.5	0.093 ± 0.005	1.4	2.9 ± 0.7	4.8
		2.13 ± 0.04		0.090 ± 0.002		2.6 ± 0.5	
21	IRLO-CN-CT2-2	8.8 ± 0.1	7.6	0.377 ± 0.002	8.3	12.3 ± 1.9	10.1
		7.6 ± 0.1		0.319 ± 0.009		10.0 ± 1.5	
22	ROCK-LS-LT3-1	13.64 ± 0.03	0.1	0.574 ± 0.002	0.7	17.2 ± 1.2	1.7
		13.66 ± 0.03		0.582 ± 0.005		17.8 ± 0.6	
23	ROCK-ML-DUP	14.2 ± 0.1	12.9	0.598 ± 0.007	13.3	19.5 ± 1.0	6.6
		18.4 ± 0.1		0.781 ± 0.007		22.2 ± 1.7	
24	IRLO-ML-MT3-1	8.16 ± 0.03	0.2	0.348 ± 0.003	0.2	10.2 ± 0.6	3.1
		8.13 ± 0.03		0.347 ± 0.005		10.8 ± 1.2	
25	IRLO-ML-MT3-3	6.46 ± 0.04	3.3	0.281 ± 0.003	4.4	8.2 ± 0.8	3.4
		6.05 ± 0.03		0.257 ± 0.004		7.7 ± 0.9	
26	IRLO-AN-ANT2-3	10.31 ± 0.04	0.0	0.434 ± 0.005	0.0	12.3 ± 1.2	7.1
		10.3 ± 0.1		0.435 ± 0.004		14.2 ± 1.1	
		Average % CV	**1.6%**		**2.0%**		**4.1%**

F5 Tritium in Seawater

At least once weekly each counter counts dead hydrogen gas (from petroleum). In addition, water from the deep Floridan aquifer (more than 10,000 year old water) is reduced to occasionally check on the tank hydrogen gas. This procedure sets the background count of the counting equipment. A further check on process blanks is that at least once a week a sample of dead water (from the Floridan aquifer) goes through all the same procedures, including enrichment, as the unknown samples. In order to check on the efficiency of the enrichment procedure, at least once a week a sample of known activity is processed through the entire system of enrichment, reduction, and counting. The efficiency of each counter is determined by counting hydrogen gas made by reduction of standard water in the regular preparation system. This standard water is prepared from NIST Standard Reference Material 4926 by dilution by weighing. The dependence of factors such as background and efficiency on parameters such as pressure, gas composition, and gas amplification is known, and the appropriate corrections are applied by the software of the computing system.

Periodically, usually about every 6 weeks, all measurements in all counters for the preceding time period are recomputed, applying statistical tests, and scrutinized for flaws in quality. Recomputation includes all measurements of unknowns, backgrounds, blanks, enrichment factors, and efficiencies. Only after this step is the result considered final. The results are then reported in Data Releases, one for each project or job.

Water samples for tritium analysis are received and inventoried using the chain of custody form supplied by the client. A computer worksheet listing sample name, volume, sample collection date, and date of arrival into lab, as well as client information, is generated. At this time, each order is given a unique job number, and each sample decimal numbered within that job. For example, the job-sample number (JB number) 123.05 indicates the fifth sample in the listing for job 123. The computer input is proofread, and the worksheet and labels are printed. An abbreviated copy of the worksheet listing is given to administrative personnel to be filed with the client's records. The preparation technician uses the worksheet to keep track of the progress of the samples. Preliminary results are recorded on this sheet as they become available through the computer. From the time the worksheet is printed, the sample is referred to by its JB number. Triple copy labels are attached to each sample bottle.

When processing begins, one of the labels bearing the JB number is attached to the processing vessel; the label then "follows" the sample through the preparation steps; i.e., it is physically transferred to the next process container. The same label is used from the beginning distillation through electrolytic enrichment, vacuum distillation, and reduction to hydrogen gas and is eventually attached to the face of the pressure gauge of the counter in which the sample is counted. During each step of sample preparation, a yellow preparation card reports the distillation date and unit number; electrolysis starting date; volume and cell number; and freeze-out date and unit number. Recorded also are the order number through the reduction system and the cylinder number used to store the gas sample prior to counting.

Appendix G

Activity Concentration of ^{137}Cs

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Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
^{137}Cs (pCi/kg)										
Amchitka Site (AMC01)										
Dolly Varden - whole	DOLL-AI-XXX-1	FAUNA	6/24/2011	98 ± 8	1	377.705 ± 30.833	3.854	J	51.468283	179.108052
Goose Egg – no shell	GOOS-AI-XXX-1	FAUNA	6/24/2011	12 ± 2	2	31.873 ± 5.312	5.312		51.491305	179.0595
Glaucous-winged Gull Egg – no shell	GWGU-AI-XXX-1	FAUNA	6/24/2011	4.2 ± 1	1.5	14.556 ± 3.466	5.199	J	51.456388	179.167
Amchitka Site (Long Shot) (AMC02)										
Chiton	CHIT-LS-LT1-1	FAUNA	7/4/2011	-0.04 ± 0.4	1.6	-0.198 ± 1.984	7.936	U	51.457555	179.195138
	CHIT-LS-LT2-1	FAUNA	7/3/2011	1.6 ± 0.4	1.2	7.495 ± 1.874	5.621	J	51.44925	179.205583
	CHIT-LS-LT3-1	FAUNA	7/3/2011	0.002 ± 0.6	1.7	0.01 ± 2.857	8.094	U	51.43	179.22667
Dragon Kelp	EUAL-LS-DUP	VEG	7/3/2011	1.4 ± 0.2	0.3	8.408 ± 1.201	1.802		51.44925	179.205583
	EUAL-LS-LT1-1	VEG	7/4/2011	0.5 ± 0.2	0.4	4.672 ± 1.869	3.738	J	51.457555	179.195138
	EUAL-LS-LT1-2	VEG	7/4/2011	2.2 ± 0.4	0.5	13.677 ± 2.487	3.108		51.457555	179.195138
	EUAL-LS-LT1-3	VEG	7/4/2011	0.7 ± 0.2	0.4	4.226 ± 1.207	2.415	J	51.457555	179.195138
	EUAL-LS-LT2-1	VEG	7/3/2011	0.5 ± 0.1	0.2	3.024 ± 0.605	1.21	J	51.44925	179.205583
	EUAL-LS-LT2-2	VEG	7/3/2011	1.3 ± 0.2	0.4	9.438 ± 1.452	2.904		51.44925	179.205583
	EUAL-LS-LT2-3	VEG	7/3/2011	0.24 ± 0.06	0.1	1.736 ± 0.434	0.723	J	51.44925	179.205583
	EUAL-LS-LT3-1	VEG	7/2/2011	2.2 ± 0.4	0.4	14.041 ± 2.553	2.553		51.43	179.22667
	EUAL-LS-LT3-2	VEG	7/2/2011	3 ± 0.6	0.7	21.347 ± 4.269	4.981		51.43	179.22667
	EUAL-LS-LT3-3	VEG	7/2/2011	1.2 ± 0.2	0.3	10.122 ± 1.687	2.53		51.43	179.22667
Rockweed	FUCU-LS-DUP	VEG	6/22/2011	3.6 ± 0.4	0.3	19.784 ± 2.198	1.649	J	51.447472	179.190888
	FUCU-LS-LT1-1	VEG	6/22/2011	2.2 ± 0.4	0.4	11.885 ± 2.161	2.161	J	51.447527	179.189361
	FUCU-LS-LT1-2	VEG	6/22/2011	3.2 ± 0.4	0.3	19.575 ± 2.447	1.835	J	51.447527	179.189361
	FUCU-LS-LT1-3	VEG	6/22/2011	2.9 ± 0.4	0.3	19.282 ± 2.66	1.995	J	51.448777	179.189305
	FUCU-LS-LT2-1	VEG	6/22/2011	5.2 ± 0.6	0.3	41 ± 4.731	2.365	J	51.447222	179.199361
	FUCU-LS-LT2-2	VEG	6/22/2011	3.4 ± 0.4	0.2	24.644 ± 2.899	1.45	J	51.44625	179.196972
	FUCU-LS-LT2-3	VEG	6/22/2011	4.2 ± 0.4	0.3	25.686 ± 2.446	1.835	J	51.446722	179.191888
	FUCU-LS-LT3-1	VEG	7/2/2011	3.7 ± 0.4	0.3	17.922 ± 1.938	1.453	J	51.433611	179.219305
	FUCU-LS-LT3-2	VEG	7/2/2011	5.8 ± 0.6	0.2	26.393 ± 2.73	0.91	J	51.430166	179.218694
	FUCU-LS-LT3-3	VEG	7/2/2011	4.2 ± 0.6	0.4	15.39 ± 2.199	1.466	J	51.430166	179.218694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-LS-DUP	FAUNA	7/12/2011	3.7 ± 1	2.2	17.967 ± 4.856	10.683	J	51.434527	179.234416
	GREN-LS-LT1-1	FAUNA	7/4/2011	2.5 ± 0.8	2.1	11.784 ± 3.771	9.898	J	51.457555	179.195138
	GREN-LS-LT1-2	FAUNA	7/4/2011	3.3 ± 1	2.8	15.621 ± 4.734	13.254	J	51.457555	179.195138
	GREN-LS-LT1-3	FAUNA	7/5/2011	1.9 ± 0.6	1.7	8.898 ± 2.81	7.961	J	51.457555	179.195138
	GREN-LS-LT2-1	FAUNA	7/3/2011	2 ± 0.8	2.1	9.664 ± 3.866	10.147	U	51.432194	179.230277
	GREN-LS-LT2-2	FAUNA	7/3/2011	4.4 ± 1	2.2	20.292 ± 4.612	10.146	J	51.432194	179.230277
	GREN-LS-LT2-3	FAUNA	7/3/2011	2.4 ± 0.8	1.8	11.42 ± 3.807	8.565	J	51.432194	179.230277
	GREN-LS-LT3-1	FAUNA	7/3/2011	4.5 ± 0.8	1.5	19.975 ± 3.551	6.658		51.43	179.22667
	GREN-LS-LT3-2	FAUNA	7/12/2011	5.6 ± 1	2.2	27.472 ± 4.906	10.793	J	51.434527	179.234416
	GREN-LS-LT3-3	FAUNA	7/12/2011	2.3 ± 0.8	1.9	11.121 ± 3.868	9.187	J	51.434527	179.234416
Halibut - whole	HALI-LS-L2M-1	FAUNA	7/13/2011	1 ± 0.2	0.1	3.839 ± 0.768	0.384		51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-LS-LT1-1	FAUNA	7/5/2011	2.2 ± 1.2	3.7	9.425 ± 5.141	15.851	U	51.457555	179.195138
	HMUS-LS-LT2-1	FAUNA	7/4/2011	1.4 ± 0.8	2.6	5.719 ± 3.268	10.622	U	51.44925	179.205583
	HMUS-LS-LT3-1	FAUNA	7/3/2011	44 ± 22	60	92.276 ± 46.138	125.831	U	51.44925	179.205583
Irish Lord - whole	IRLO-LS-LT1-1	FAUNA	7/4/2011	2.7 ± 0.8	1.8	12.733 ± 3.773	8.489	J	51.457555	179.195138
	IRLO-LS-LT1-2	FAUNA	7/4/2011	2 ± 0.8	2.2	9.462 ± 3.785	10.408	U	51.457555	179.195138
	IRLO-LS-LT1-3	FAUNA	7/5/2011	2.5 ± 0.8	2.3	13.257 ± 4.242	12.196	J	51.457555	179.195138
	IRLO-LS-LT2-1	FAUNA	7/3/2011	6.3 ± 1.2	2.5	27.266 ± 5.193	10.82	J	51.432194	179.230277
	IRLO-LS-LT2-2	FAUNA	7/3/2011	1.7 ± 0.6	1.4	7.043 ± 2.486	5.8	J	51.432194	179.230277
	IRLO-LS-LT2-3	FAUNA	7/3/2011	3.3 ± 1.2	3.5	14.619 ± 5.316	15.505	J	51.432194	179.230277
	IRLO-LS-LT3-1	FAUNA	7/2/2011	0.7 ± 0.2	0.8	3.122 ± 0.892	3.568	U	51.43	179.22667
	IRLO-LS-LT3-2	FAUNA	7/12/2011	1.7 ± 0.8	1.9	8.065 ± 3.795	9.014	U	51.434944	179.2315
	IRLO-LS-LT3-3	FAUNA	7/12/2011	2.3 ± 0.8	1.8	12.707 ± 4.42	9.945	J	51.434944	179.2315
Octopus	OCTP-LS-L2M-1	FAUNA	7/3/2011	0.23 ± 0.06	0.2	1.639 ± 0.428	1.425	J	51.44925	179.205583
Pacific Cod - whole	PCOD-LS-L2M-1	FAUNA	7/4/2011	2.1 ± 0.2	0.2	10.45 ± 0.995	0.995		51.451805	179.196972
Rockfish - whole	ROCK-LS-DUP	FAUNA	7/12/2011	2.4 ± 0.8	1.8	9.359 ± 3.12	7.019	J	51.434944	179.2315
	ROCK-LS-DUP2	FAUNA	7/12/2011	1.3 ± 0.4	0.7	5.563 ± 1.712	2.995	J	51.465472	179.206722
	ROCK-LS-LT1-1	FAUNA	7/4/2011	2 ± 0.8	2.2	9.288 ± 3.715	10.216	U	51.457555	179.195138
	ROCK-LS-LT1-2	FAUNA	7/12/2011	3.4 ± 0.6	1.3	14.045 ± 2.478	5.37	J	51.465472	179.206722
	ROCK-LS-LT1-3	FAUNA	7/12/2011	4.1 ± 0.8	1.4	16.921 ± 3.302	5.778	J	51.465472	179.206722
	ROCK-LS-LT2-1	FAUNA	7/4/2011	4.8 ± 0.8	1.5	19.251 ± 3.209	6.016		51.44925	179.205583
	ROCK-LS-LT2-2	FAUNA	7/12/2011	5.3 ± 1	2	20.916 ± 3.946	7.893	J	51.44625	179.223416
	ROCK-LS-LT3-1	FAUNA	7/12/2011	2.3 ± 0.8	1.9	10.123 ± 3.521	8.362	J	51.434944	179.2315
	ROCK-LS-LT3-2	FAUNA	7/12/2011	2.8 ± 0.6	1.4	11.878 ± 2.545	5.939	J	51.434944	179.2315
	ROCK-LS-LT3-3	FAUNA	7/3/2011	1.2 ± 0.2	0.7	4.14 ± 0.69	2.415	J	51.43	179.22667

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-LT1-2	VEG	6/22/2011	404 ± 14	8	1224.835 ± 42.445	24.254		51.447361	179.189111
Sea Urchin - whole	URCH-LS-LT1-1	FAUNA	7/4/2011	1.1 ± 0.6	1.7	4.297 ± 2.344	6.641	U	51.457555	179.195138
	URCH-LS-LT2-1	FAUNA	7/3/2011	1.8 ± 0.6	1.6	6.916 ± 2.305	6.147	J	51.44925	179.205583
	URCH-LS-LT3-1	FAUNA	7/2/2011	9.9 ± 2.7	4.3	38.562 ± 10.517	16.749	J	51.43	179.22667
Amchitka Site (Milrow) (AMC03)										
Chiton	CHIT-ML-MT1-1	FAUNA	7/9/2011	0.6 ± 0.4	1.2	2.263 ± 1.508	4.525	U	51.408472	179.139166
	CHIT-ML-MT2-1	FAUNA	7/10/2011	2.1 ± 0.8	2.2	9.751 ± 3.715	10.215	U	51.389416	179.173138
	CHIT-ML-MT3-1	FAUNA	7/10/2011	0.3 ± 0.4	1.4	1.361 ± 1.815	6.353	U	51.387805	179.184
Dragon Kelp	EUAL-ML-DUP	VEG	7/9/2011	0.5 ± 0.2	0.3	3.768 ± 1.507	2.261	J	51.408472	179.139166
	EUAL-ML-MT1-1	VEG	7/9/2011	1.4 ± 0.2	0.3	11.192 ± 1.599	2.398		51.408472	179.139166
	EUAL-ML-MT1-2	VEG	7/9/2011	0.4 ± 0.2	0.3	2.976 ± 1.488	2.232	J	51.408472	179.139166
	EUAL-ML-MT1-3	VEG	7/9/2011	0.35 ± 0.1	0.2	2.944 ± 0.841	1.682	J	51.408472	179.139166
	EUAL-ML-MT2-1	VEG	7/10/2011	0.9 ± 0.2	0.4	6.708 ± 1.491	2.981	J	51.389416	179.173138
	EUAL-ML-MT2-2	VEG	7/10/2011	0.5 ± 0.2	0.3	3.543 ± 1.417	2.126	J	51.389416	179.173138
	EUAL-ML-MT2-3	VEG	7/10/2011	2.4 ± 0.4	0.6	18.091 ± 3.015	4.523		51.389416	179.173138
	EUAL-ML-MT3-1	VEG	7/10/2011	0.63 ± 0.1	0.2	4.432 ± 0.703	1.407		51.387805	179.184
	EUAL-ML-MT3-2	VEG	7/10/2011	0.8 ± 0.2	0.4	5.845 ± 1.461	2.922	J	51.387805	179.184
	EUAL-ML-MT3-3	VEG	7/10/2011	1 ± 0.2	0.3	6.896 ± 1.379	2.069		51.387805	179.184
Rockweed	FUCU-ML-DUP	VEG	6/20/2011	1.8 ± 0.2	0.3	7.81 ± 0.868	1.302	J	51.412449	179.160843
	FUCU-ML-MT1-1	VEG	6/20/2011	2.1 ± 0.2	0.2	8.749 ± 0.833	0.833	J	51.412449	179.160843
	FUCU-ML-MT1-2	VEG	6/21/2011	2.3 ± 0.2	0.3	13.952 ± 1.213	1.82	J	51.417083	179.134083
	FUCU-ML-MT1-3	VEG	7/9/2011	1.7 ± 0.2	0.4	7.814 ± 0.919	1.839	J	51.417083	179.134083
	FUCU-ML-MT2-1	VEG	6/20/2011	2.9 ± 0.4	0.3	14.966 ± 2.064	1.548	J	51.403305	179.167166
	FUCU-ML-MT2-2	VEG	6/21/2011	3.4 ± 0.4	0.2	23.887 ± 2.81	1.405	J	51.405694	179.161361
	FUCU-ML-MT2-3	VEG	6/21/2011	2.9 ± 0.4	0.3	20.137 ± 2.777	2.083	J	51.405694	179.161361
	FUCU-ML-MT3-1	VEG	7/10/2011	3.1 ± 0.4	0.3	15.054 ± 1.943	1.457	J	51.389416	179.173138
	FUCU-ML-MT3-2	VEG	7/10/2011	2.4 ± 0.2	0.3	11.526 ± 0.961	1.441	J	51.389416	179.173138
	FUCU-ML-MT3-3	VEG	7/10/2011	1.9 ± 0.4	0.5	9.592 ± 2.019	2.524	J	51.389416	179.173138

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-ML-DUP	FAUNA	7/10/2011	7.7 ± 2	2.4	37.338 ± 9.698	11.638		51.387805	179.184
	GREN-ML-MT1-1	FAUNA	7/9/2011	4.9 ± 1	2.2	21.344 ± 4.356	9.583	J	51.408472	179.139166
	GREN-ML-MT1-2	FAUNA	7/9/2011	3.2 ± 0.8	1.9	14.817 ± 3.704	8.797	J	51.408472	179.139166
	GREN-ML-MT1-3	FAUNA	7/9/2011	5.7 ± 1	2	27.523 ± 4.829	9.657	J	51.408472	179.139166
	GREN-ML-MT2-1	FAUNA	7/11/2011	6.7 ± 1	1.7	31.232 ± 4.662	7.925		51.396944	179.1435
	GREN-ML-MT2-2	FAUNA	7/11/2011	2.5 ± 0.8	2.2	11.703 ± 3.745	10.299	J	51.396944	179.1435
	GREN-ML-MT2-3	FAUNA	7/11/2011	3.4 ± 0.8	2.1	16.235 ± 3.82	10.027	J	51.396944	179.1435
	GREN-ML-MT3-1	FAUNA	7/10/2011	5.5 ± 0.8	1.5	26.674 ± 3.88	7.275		51.387805	179.184
	GREN-ML-MT3-2	FAUNA	7/10/2011	7.8 ± 1.4	2.7	37.633 ± 6.755	13.027	J	51.387805	179.184
	GREN-ML-MT3-3	FAUNA	7/10/2011	3.9 ± 1	2.2	18.478 ± 4.738	10.423	J	51.387805	179.184
Halibut - whole	HALI-ML-M2M-1	FAUNA	7/11/2011	0.82 ± 0.1	0.1	2.849 ± 0.347	0.347		51.365055	179.111472
Horse Mussel - soft tissue only	HMUS-ML-MT1-1	FAUNA	7/9/2011	7 ± 1.8	4.6	31.832 ± 8.185	20.918	J	51.408472	179.139166
	HMUS-ML-MT2-1	FAUNA	7/11/2011	5.9 ± 2	5.4	26.535 ± 8.995	24.286	J	51.389416	179.173138
	HMUS-ML-MT3-1	FAUNA	7/10/2011	6.7 ± 2.4	6.1	30.757 ± 11.017	28.002	J	51.387805	179.184
Irish Lord - whole	IRLO-ML-MT1-1	FAUNA	7/9/2011	1.2 ± 0.4	1.1	5.123 ± 1.708	4.696	J	51.408472	179.139166
	IRLO-ML-MT1-2	FAUNA	7/9/2011	2.8 ± 0.8	1.8	13.28 ± 3.794	8.537	J	51.408472	179.139166
	IRLO-ML-MT1-3	FAUNA	7/9/2011	6.4 ± 1.2	2.7	29.981 ± 5.621	12.648	J	51.408472	179.139166
	IRLO-ML-MT2-1	FAUNA	7/10/2011	4.6 ± 0.8	1.8	19.822 ± 3.447	7.756	J	51.389416	179.173138
	IRLO-ML-MT2-2	FAUNA	7/11/2011	6.1 ± 1.4	2.9	26.282 ± 6.032	12.495	J	51.396944	179.1435
	IRLO-ML-MT2-3	FAUNA	7/11/2011	0.2 ± 0.6	1.7	0.949 ± 2.846	8.064	U	51.396944	179.1435
	IRLO-ML-MT3-1	FAUNA	7/10/2011	9.5 ± 1.6	1.2	53.555 ± 9.02	6.765	J	51.387805	179.184
	IRLO-ML-MT3-2	FAUNA	7/10/2011	1.8 ± 0.4	1.2	8.691 ± 1.931	5.794	J	51.387805	179.184
	IRLO-ML-MT3-3	FAUNA	7/10/2011	2.1 ± 0.6	1.5	11.772 ± 3.363	8.409	J	51.387805	179.184
Octopus	OCTP-ML-M2M-1	FAUNA	7/10/2011	1.1 ± 0.4	1.1	5.188 ± 1.886	5.188	J	51.389416	179.173138
Pacific Cod - whole	PCOD-ML-M2M-1	FAUNA	7/10/2011	2.8 ± 0.2	0.3	14.806 ± 1.058	1.586		51.408472	179.139166
Rockfish - whole	ROCK-ML-DUP	FAUNA	7/9/2011	3.6 ± 0.8	1.7	15.915 ± 3.537	7.515	J	51.408472	179.139166
	ROCK-ML-MT1-1	FAUNA	7/9/2011	1.1 ± 0.4	0.9	4.842 ± 1.761	3.962		51.408472	179.139166
	ROCK-ML-MT1-2	FAUNA	7/9/2011	5 ± 0.8	1.4	21.947 ± 3.511	6.145		51.408472	179.139166
	ROCK-ML-MT1-3	FAUNA	7/9/2011	1.9 ± 0.4	0.8	8.043 ± 1.693	3.386	J	51.408472	179.139166
	ROCK-ML-MT2-1	FAUNA	7/11/2011	0.5 ± 0.4	1.1	1.877 ± 1.501	4.128	U	51.365055	179.111472
	ROCK-ML-MT2-2	FAUNA	7/11/2011	4 ± 0.8	1.9	16.186 ± 3.237	7.688	J	51.365055	179.111472
	ROCK-ML-MT2-3	FAUNA	7/11/2011	5.2 ± 1	2.1	23.427 ± 4.505	9.461	J	51.365055	179.111472
	ROCK-ML-MT3-1	FAUNA	7/10/2011	0.6 ± 0.4	1.2	2.831 ± 1.888	5.663	U	51.387805	179.184
	ROCK-ML-MT3-2	FAUNA	7/10/2011	2.8 ± 0.6	1.1	10.076 ± 2.159	3.958	J	51.387805	179.184
	ROCK-ML-MT3-3	FAUNA	7/10/2011	3.9 ± 0.8	1.4	9.075 ± 1.862	3.258	J	51.387805	179.184

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-ML-1	VEG	6/21/2011	550 ± 14	8	1968.354 ± 50.104	28.631		51.402583	179.183972
Sea Urchin - whole	URCH-ML-MT1-1	FAUNA	7/9/2011	2.3 ± 0.6	1.6	8.532 ± 2.226	5.936	J	51.408472	179.139166
	URCH-ML-MT2-1	FAUNA	7/10/2011	0.7 ± 0.6	1.6	2.614 ± 2.241	5.976	U	51.389416	179.173138
	URCH-ML-MT3-1	FAUNA	7/10/2011	-0.1 ± 0.4	1.1	-0.397 ± 1.588	4.367	U	51.387805	179.184
Amchitka Site (Cannikin) (AMC05)										
Chiton	CHIT-CN-CT1-1	FAUNA	7/8/2011	2.8 ± 1	2.8	13.114 ± 4.684	13.114	U	51.482972	179.123833
	CHIT-CN-CT2-1	FAUNA	7/7/2011	4.1 ± 0.8	1.8	19.403 ± 3.786	8.518	J	51.472611	179.151111
	CHIT-CN-CT3-1	FAUNA	7/5/2011	2.6 ± 1	2.5	12.762 ± 4.908	12.271	J	51.471416	179.172861
Dragon Kelp	EUAL-CN-CT1-1	VEG	7/8/2011	1.8 ± 0.2	0.3	13.324 ± 1.48	2.221		51.482972	179.123833
	EUAL-CN-CT1-2	VEG	7/8/2011	2.5 ± 0.4	0.5	16.299 ± 2.608	3.26		51.482972	179.123833
	EUAL-CN-CT1-3	VEG	7/8/2011	3.2 ± 0.6	0.7	19.6 ± 3.675	4.288	J	51.482972	179.123833
	EUAL-CN-CT2-1	VEG	7/6/2011	1.8 ± 0.2	0.4	11.48 ± 1.276	2.551		51.472611	179.151111
	EUAL-CN-CT2-2	VEG	7/6/2011	2.7 ± 0.4	0.3	16.946 ± 2.511	1.883		51.472611	179.151111
	EUAL-CN-CT2-3	VEG	7/7/2011	1.4 ± 0.2	0.4	10.15 ± 1.45	2.9		51.472611	179.151111
	EUAL-CN-CT3-1	VEG	7/5/2011	2.5 ± 0.4	0.6	17.433 ± 2.789	4.184	J	51.471416	179.172861
	EUAL-CN-CT3-2	VEG	7/5/2011	1.9 ± 0.4	0.5	13.66 ± 2.876	3.595		51.471416	179.172861
	EUAL-CN-CT3-3	VEG	7/5/2011	2.5 ± 0.4	0.5	16.249 ± 2.6	3.25		51.471416	179.172861
	EUAL-CN-DUP	VEG	7/6/2011	3.1 ± 0.4	0.4	20.598 ± 2.658	2.658		51.471416	179.172861
Rockweed	FUCU-CN-CT1-1	VEG	6/23/2011	3 ± 0.4	0.2	17.301 ± 2.307	1.153	J	51.481888	179.118138
	FUCU-CN-CT1-2	VEG	6/23/2011	3.2 ± 0.4	0.3	20.154 ± 2.519	1.889	J	51.481888	179.118138
	FUCU-CN-CT1-3	VEG	6/23/2011	5.4 ± 0.6	0.3	31.834 ± 3.537	1.769	J	51.481888	179.118138
	FUCU-CN-CT2-1	VEG	7/8/2011	3.3 ± 0.4	0.4	13.637 ± 1.653	1.653	J	51.476638	179.135277
	FUCU-CN-CT2-2	VEG	7/8/2011	4.2 ± 0.4	0.3	18.636 ± 1.775	1.331	J	51.476638	179.135277
	FUCU-CN-CT2-3	VEG	7/12/2011	1.3 ± 0.2	0.3	6.872 ± 1.057	1.586	J	51.467583	179.153583
	FUCU-CN-CT3-1	VEG	7/6/2011	3.3 ± 0.4	0.3	17.782 ± 2.155	1.617	J	51.465027	179.173166
	FUCU-CN-CT3-2	VEG	7/6/2011	5.4 ± 0.6	0.3	31.696 ± 3.522	1.761	J	51.465472	179.170583
	FUCU-CN-CT3-3	VEG	7/6/2011	3 ± 0.4	0.5	19.038 ± 2.538	3.173	J	51.464638	179.159305
	FUCU-CN-DUP	VEG	6/23/2011	3.3 ± 0.2	0.2	21.291 ± 1.29	1.29	J	51.481888	179.118138

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-CN-CT1-1	FAUNA	7/8/2011	6.6 ± 1.2	2.2	31.816 ± 5.785	10.605		51.482972	179.123833
	GREN-CN-CT1-2	FAUNA	7/8/2011	5.5 ± 1	2.1	26.121 ± 4.749	9.974	J	51.482972	179.123833
	GREN-CN-CT1-3	FAUNA	7/8/2011	6.4 ± 1	1.9	29.164 ± 4.557	8.658		51.482972	179.123833
	GREN-CN-CT2-1	FAUNA	7/7/2011	5.1 ± 1	2.2	24.857 ± 4.874	10.723	J	51.472611	179.151111
	GREN-CN-CT2-2	FAUNA	7/7/2011	5.4 ± 1	1.8	24.777 ± 4.588	8.259		51.472611	179.151111
	GREN-CN-CT2-3	FAUNA	7/7/2011	3.9 ± 0.8	2	17.997 ± 3.692	9.229	J	51.472611	179.151111
	GREN-CN-CT3-1	FAUNA	7/5/2011	7.7 ± 1	1.8	35.092 ± 4.557	8.203		51.471416	179.172861
	GREN-CN-CT3-2	FAUNA	7/5/2011	4.9 ± 1	2	21.344 ± 4.356	8.712	J	51.471416	179.172861
	GREN-CN-CT3-3	FAUNA	7/5/2011	4.8 ± 1	2	22.041 ± 4.592	9.184	J	51.471416	179.172861
	GREN-CN-DUP	FAUNA	7/8/2011	2.7 ± 0.8	2	13.021 ± 3.858	9.645	J	51.482972	179.123833
Halibut - whole	HALI-CN-C2M-1	FAUNA	7/13/2011	1.5 ± 0.2	0.2	5.805 ± 0.774	0.774		51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-CN-CT1-1	FAUNA	7/8/2011	14 ± 4	5	57.554 ± 16.444	20.555	J	51.482972	179.123833
	HMUS-CN-CT2-1	FAUNA	7/7/2011	11 ± 2	5	49.846 ± 9.063	22.657	J	51.472611	179.151111
	HMUS-CN-CT3-1	FAUNA	7/5/2011	11 ± 2	5	45.124 ± 8.204	20.511	J	51.471416	179.172861
Irish Lord - whole	IRLO-CN-CT1-1	FAUNA	7/8/2011	1.7 ± 0.6	1.8	7.661 ± 2.704	8.112	U	51.482972	179.123833
	IRLO-CN-CT1-2	FAUNA	7/8/2011	1.6 ± 0.6	1.5	8.02 ± 3.007	7.518	J	51.482972	179.123833
	IRLO-CN-CT1-3	FAUNA	7/8/2011	3.4 ± 1.4	3.9	15.972 ± 6.577	18.32	U	51.482972	179.123833
	IRLO-CN-CT2-1	FAUNA	7/7/2011	1.4 ± 0.6	1.5	6.598 ± 2.828	7.069	U	51.472611	179.151111
	IRLO-CN-CT2-2	FAUNA	7/7/2011	-0.2 ± 0.4	1.7	-0.914 ± 1.828	7.767	U	51.472611	179.151111
	IRLO-CN-CT2-3	FAUNA	7/7/2011	2.6 ± 0.8	2.2	12.797 ± 3.938	10.828	J	51.472611	179.151111
	IRLO-CN-CT3-1	FAUNA	7/5/2011	2.7 ± 1	2.5	13.911 ± 5.152	12.881	J	51.471416	179.172861
	IRLO-CN-CT3-2	FAUNA	7/5/2011	2 ± 0.8	1.9	9.697 ± 3.879	9.212	J	51.471416	179.172861
	IRLO-CN-CT3-3	FAUNA	7/5/2011	0.3 ± 0.4	1.3	1.438 ± 1.918	6.232	U	51.471416	179.172861
Octopus	OCTP-CN-C2M-1	FAUNA	7/8/2011	2.1 ± 0.4	0.7	10.292 ± 1.96	3.431		51.482972	179.123833
Pacific Cod - whole	PCOD-CN-C2M-1	FAUNA	7/6/2011	3.8 ± 0.6	0.5	17.399 ± 2.747	2.289		51.483527	179.187583
Rockfish - whole	ROCK-CN-CT1-1	FAUNA	7/8/2011	3.3 ± 0.8	1.7	13.038 ± 3.161	6.716	J	51.482972	179.123833
	ROCK-CN-CT1-2	FAUNA	7/8/2011	3.3 ± 0.6	1.2	12.727 ± 2.314	4.628	J	51.482972	179.123833
	ROCK-CN-CT1-3	FAUNA	7/8/2011	4.5 ± 0.6	1.1	18.083 ± 2.411	4.42		51.482972	179.123833
	ROCK-CN-CT2-1	FAUNA	7/6/2011	3.2 ± 0.6	1.3	11.302 ± 2.119	4.591	J	51.472611	179.151111
	ROCK-CN-CT2-2	FAUNA	7/6/2011	3.3 ± 0.6	1.2	12.081 ± 2.197	4.393	J	51.472611	179.151111
	ROCK-CN-CT2-3	FAUNA	7/6/2011	1.9 ± 0.6	1.6	7.772 ± 2.454	6.545	J	51.472611	179.151111
	ROCK-CN-CT3-1	FAUNA	7/6/2011	3.7 ± 0.8	1.5	15.802 ± 3.417	6.406	J	51.471416	179.172861
	ROCK-CN-CT3-2	FAUNA	7/6/2011	4.5 ± 0.6	1.2	17.291 ± 2.305	4.611		51.471416	179.172861
	ROCK-CN-CT3-3	FAUNA	7/6/2011	6.4 ± 1	2	26.748 ± 4.179	8.359		51.471416	179.172861
	ROCK-CN-DUP	FAUNA	7/6/2011	4 ± 1	2.1	16.065 ± 4.016	8.434	J	51.471416	179.172861

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-CT1-1	VEG	6/23/2011	1523 ± 27	15	2414.39 ± 42.803	23.779		51.480583	179.109472
Sea Urchin - whole	URCH-CN-CT1-1	FAUNA	7/8/2011	0.7 ± 0.4	1.3	2.809 ± 1.605	5.216	U	51.482972	179.123833
	URCH-CN-CT2-1	FAUNA	7/7/2011	7.2 ± 1	1.7	24.672 ± 3.427	5.825		51.472611	179.151111
	URCH-CN-CT3-1	FAUNA	7/5/2011	2.3 ± 0.6	1.2	8.81 ± 2.298	4.597	J	51.471416	179.172861
Amchitka Site (Adak Island) (AMC13)										
Dolly Varden - whole	DOLL-AD-XXX-1	FAUNA	6/28/2011	447 ± 37	1	1823.192 ± 150.913	4.079	J	51.8375	-176.672555
Reindeer Lichen	STRL-AD-XXX-1	VEG	6/28/2011	6236 ± 82	33	12206.851 ± 160.513	64.597		51.837527	-176.670694
	STRL-AD-XXX-2	VEG	6/29/2011	3238 ± 37	16	8000.474 ± 91.42	39.533		51.872833	-176.707444
	STRL-AD-XXX-3	VEG	6/29/2011	2855 ± 39	19	4535.668 ± 61.958	30.185		51.900805	-176.688527
Amchitka Site (Adak Island North) (AMC14)										
Chiton	CHIT-AN-ANT1-1	FAUNA	7/20/2011	0.9 ± 0.2	0.7	4.383 ± 0.974	3.409	J	51.838722	-176.582805
	CHIT-AN-ANT2-1	FAUNA	7/18/2011	0.8 ± 0.2	0.7	4.01 ± 1.002	3.509	J	51.848361	-176.506277
	CHIT-AN-ANT3-1	FAUNA	7/17/2011	1.3 ± 0.6	1.4	6.611 ± 3.051	7.119	J	51.853722	-176.470694
Dragon Kelp	EUAL-AN-ANT1-1	VEG	7/19/2011	0.4 ± 0.2	0.3	3.354 ± 1.677	2.516	J	51.835694	-176.542138
	EUAL-AN-ANT1-2	VEG	7/19/2011	1 ± 0.2	0.3	6.817 ± 1.363	2.045		51.835694	-176.542138
	EUAL-AN-ANT1-3	VEG	7/19/2011	0.8 ± 0.2	0.4	6.183 ± 1.546	3.092	J	51.835694	-176.542138
	EUAL-AN-ANT2-1	VEG	7/18/2011	0.7 ± 0.2	0.3	5.103 ± 1.458	2.187	J	51.848361	-176.506277
	EUAL-AN-ANT2-2	VEG	7/18/2011	0.35 ± 0.08	0.2	2.23 ± 0.51	1.274	J	51.848361	-176.506277
	EUAL-AN-ANT2-3	VEG	7/18/2011	0.24 ± 0.08	0.2	1.667 ± 0.556	1.389	J	51.848361	-176.506277
	EUAL-AN-ANT3-1	VEG	7/17/2011	1.2 ± 0.2	0.4	8.969 ± 1.495	2.99		51.853722	-176.470694
	EUAL-AN-ANT3-2	VEG	7/17/2011	2 ± 0.4	0.4	13.638 ± 2.728	2.728		51.853722	-176.470694
	EUAL-AN-ANT3-3	VEG	7/17/2011	0.9 ± 0.2	0.3	6.04 ± 1.342	2.013		51.853722	-176.470694
	EUAL-AN-DUP	VEG	7/17/2011	1.5 ± 0.4	0.8	9.432 ± 2.515	5.03	J	51.853722	-176.470694
Rockweed	FUCU-AN-ANT1-1	VEG	7/19/2011	5.5 ± 0.6	0.3	28.022 ± 3.057	1.528	J	51.841444	-176.546083
	FUCU-AN-ANT1-2	VEG	7/20/2011	4.1 ± 0.4	0.3	26.45 ± 2.58	1.935	J	51.8395	-176.591305
	FUCU-AN-ANT1-3	VEG	7/20/2011	6.7 ± 1	0.4	36.564 ± 5.457	2.183	J	51.8395	-176.591305
	FUCU-AN-ANT2-1	VEG	7/18/2011	3.3 ± 0.4	0.3	20.84 ± 2.526	1.895	J	51.837666	-176.517527
	FUCU-AN-ANT2-2	VEG	7/18/2011	3.3 ± 0.4	0.3	17.542 ± 2.126	1.595	J	51.841444	-176.546083
	FUCU-AN-ANT2-3	VEG	7/18/2011	5.6 ± 0.6	0.3	23.623 ± 2.531	1.266	J	51.8395	-176.591305
	FUCU-AN-ANT3-1	VEG	7/18/2011	7.3 ± 0.8	0.3	41.766 ± 4.577	1.716	J	51.839944	-176.515916
	FUCU-AN-ANT3-2	VEG	7/18/2011	6.6 ± 1	0.4	32.263 ± 4.888	1.955	J	51.828972	-176.448305
	FUCU-AN-ANT3-3	VEG	7/18/2011	2.9 ± 0.4	0.3	14.418 ± 1.989	1.492	J	51.830833	-176.456361
	FUCU-AN-DUP	VEG	7/18/2011	3.5 ± 0.4	0.4	16.287 ± 1.861	1.861	J	51.828972	-176.448305

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-AN-ANT1-1	FAUNA	7/19/2011	6.5 ± 1.2	2.4	28.853 ± 5.327	10.653	J	51.835694	-176.542138
	GREN-AN-ANT1-2	FAUNA	7/19/2011	3.2 ± 0.8	2.1	13.365 ± 3.341	8.771	J	51.835694	-176.542138
	GREN-AN-ANT1-3	FAUNA	7/19/2011	4 ± 1.4	3.6	14.569 ± 5.099	13.112	J	51.835694	-176.542138
	GREN-AN-ANT2-1	FAUNA	7/18/2011	2.5 ± 0.6	1.6	11.566 ± 2.776	7.402	J	51.848361	-176.506277
	GREN-AN-ANT2-2	FAUNA	7/18/2011	2.6 ± 0.8	2.2	12.051 ± 3.708	10.197	J	51.848361	-176.506277
	GREN-AN-ANT2-3	FAUNA	7/18/2011	2.5 ± 0.8	2	11.855 ± 3.793	9.484	J	51.848361	-176.506277
	GREN-AN-ANT3-1	FAUNA	7/17/2011	0.9 ± 0.6	1.7	4.108 ± 2.739	7.759	J	51.853722	-176.470694
	GREN-AN-ANT3-2	FAUNA	7/17/2011	3.2 ± 0.8	2.1	14.86 ± 3.715	9.752	J	51.853722	-176.470694
	GREN-AN-ANT3-3	FAUNA	7/17/2011	2.5 ± 0.8	2	11.633 ± 3.723	9.307	J	51.853722	-176.470694
	GREN-AN-DUP	FAUNA	7/17/2011	5.8 ± 1.2	2.4	27.626 ± 5.716	11.431	J	51.853722	-176.470694
Halibut - whole	HALI-AN-AN2M-1	FAUNA	7/17/2011	1 ± 0.2	0.2	3.339 ± 0.668	0.668		51.853722	-176.470694
	HALI-AN-DUP	FAUNA	7/17/2011	0.8 ± 0.2	0.3	2.651 ± 0.663	0.994	J	51.853722	-176.470694
Horse Mussel - soft tissue only	HMUS-AN-ANT1-1	FAUNA	7/20/2011	15 ± 2	4.2	82.012 ± 10.935	22.963		51.838722	-176.582805
	HMUS-AN-ANT2-1	FAUNA	7/18/2011	7.2 ± 1.8	4.5	33.064 ± 8.266	20.665	J	51.848361	-176.506277
	HMUS-AN-ANT3-1	FAUNA	7/18/2011	3.4 ± 1	2.7	15.153 ± 4.457	12.033	J	51.853722	-176.470694
Irish Lord - whole	IRLO-AN-ANT1-1	FAUNA	7/19/2011	3.3 ± 1	2.5	15.488 ± 4.693	11.734	J	51.835694	-176.542138
	IRLO-AN-ANT1-2	FAUNA	7/19/2011	0.7 ± 0.6	1.6	3.107 ± 2.663	7.103	U	51.835694	-176.542138
	IRLO-AN-ANT1-3	FAUNA	7/19/2011	4.4 ± 0.8	1.6	19.335 ± 3.515	7.031	J	51.835694	-176.542138
	IRLO-AN-ANT2-1	FAUNA	7/19/2011	0.5 ± 0.4	1.4	2.371 ± 1.897	6.638	U	51.848361	-176.506277
	IRLO-AN-ANT2-2	FAUNA	7/19/2011	4.1 ± 0.8	1.7	18.993 ± 3.706	7.875	J	51.848361	-176.506277
	IRLO-AN-ANT2-3	FAUNA	7/19/2011	0.2 ± 0.2	0.9	0.953 ± 0.953	4.29	U	51.848361	-176.506277
	IRLO-AN-ANT3-1	FAUNA	7/17/2011	4.4 ± 1	1.9	21.105 ± 4.797	9.113	J	51.853722	-176.470694
	IRLO-AN-ANT3-2	FAUNA	7/17/2011	13 ± 2	2.3	58.65 ± 9.023	10.377	J	51.853722	-176.470694
	IRLO-AN-ANT3-3	FAUNA	7/17/2011	2.6 ± 0.6	1.7	11.682 ± 2.696	7.638	J	51.853722	-176.470694
Octopus	OCTP-AN-AN2M-1	FAUNA	7/18/2011	0.7 ± 0.2	0.5	3.543 ± 1.012	2.531	J	51.848361	-176.506277
Pacific Cod - whole	PCOD-AN-AN2M-1	FAUNA	7/17/2011	2 ± 0.2	0.2	9.728 ± 0.973	0.973		51.853722	-176.470694
Rockfish - whole	ROCK-AN-ANT1-1	FAUNA	7/19/2011	2.4 ± 0.4	0.8	8.879 ± 1.48	2.96		51.835694	-176.542138
	ROCK-AN-ANT2-1	FAUNA	7/18/2011	3.4 ± 0.4	0.7	12.423 ± 1.462	2.558		51.848361	-176.506277
	ROCK-AN-ANT2-2	FAUNA	7/18/2011	3 ± 0.4	0.9	12.26 ± 1.635	3.678		51.848361	-176.506277
	ROCK-AN-ANT3-1	FAUNA	7/17/2011	3.2 ± 0.8	1.7	11.402 ± 2.851	6.057	J	51.853722	-176.470694
	ROCK-AN-ANT3-2	FAUNA	7/17/2011	4.2 ± 0.6	0.9	16.203 ± 2.315	3.472		51.853722	-176.470694
	ROCK-AN-ANT3-3	FAUNA	7/17/2011	4.6 ± 1	2.1	18.057 ± 3.925	8.243	J	51.853722	-176.470694
Sea Urchin - whole	URCH-AN-ANT1-1	FAUNA	7/19/2011	1.3 ± 0.6	1.6	4.43 ± 2.045	5.452	U	51.835694	-176.542138
	URCH-AN-ANT2-1	FAUNA	7/18/2011	1.2 ± 0.4	1.3	4.371 ± 1.457	4.736	U	51.848361	-176.506277
	URCH-AN-ANT3-1	FAUNA	7/17/2011	9.4 ± 2.4	3.7	35.733 ± 9.123	14.065	J	51.853722	-176.470694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Amchitka Site (Adak Island South) (AMC15)										
Chiton	CHIT-AS-AST1-1	FAUNA	7/15/2011	-0.4 ± 0.4	4	-1.644 ± 1.644	16.436	U	51.737472	-176.48025
	CHIT-AS-AST2-1	FAUNA	7/16/2011	1.3 ± 0.4	1.2	6.655 ± 2.048	6.143	J	51.745666	-176.507055
	CHIT-AS-AST3-1	FAUNA	7/14/2011	1.5 ± 0.6	1.9	7.066 ± 2.826	8.95	U	51.688333	-176.63375
Dragon Kelp	EUAL-AS-AST1-1	VEG	7/15/2011	1.3 ± 0.2	0.5	8.567 ± 1.318	3.295	J	51.737472	-176.48025
	EUAL-AS-AST1-2	VEG	7/15/2011	0.33 ± 0.08	0.2	2.628 ± 0.637	1.593	J	51.737472	-176.48025
	EUAL-AS-AST1-3	VEG	7/15/2011	0.8 ± 0.2	0.2	7.677 ± 1.919	1.919		51.737472	-176.48025
	EUAL-AS-AST2-1	VEG	7/16/2011	0.8 ± 0.2	0.2	5.688 ± 1.422	1.422		51.745666	-176.507055
	EUAL-AS-AST2-2	VEG	7/16/2011	1.6 ± 0.2	0.5	11.321 ± 1.415	3.538		51.745666	-176.507055
	EUAL-AS-AST2-3	VEG	7/16/2011	0.8 ± 0.2	0.3	5.812 ± 1.453	2.179	J	51.745666	-176.507055
	EUAL-AS-AST3-1	VEG	7/14/2011	1.8 ± 0.4	0.4	13.148 ± 2.922	2.922		51.688333	-176.63375
	EUAL-AS-AST3-2	VEG	7/14/2011	0.2 ± 0.2	0.3	1.896 ± 1.896	2.844	J	51.688333	-176.63375
	EUAL-AS-AST3-3	VEG	7/14/2011	0.46 ± 0.08	0.2	4.056 ± 0.705	1.763	J	51.688333	-176.63375
	EUAL-AS-DUP	VEG	7/14/2011	0.5 ± 0.2	0.2	3.679 ± 1.472	1.472	J	51.688333	-176.63375
Rockweed	FUCU-AS-AST1-1	VEG	7/16/2011	5.1 ± 0.6	0.3	31.46 ± 3.701	1.851	J	51.733666	-176.470805
	FUCU-AS-AST1-2	VEG	7/16/2011	1.8 ± 0.2	0.4	9.985 ± 1.109	2.219	J	51.733666	-176.470805
	FUCU-AS-AST1-3	VEG	7/16/2011	1.4 ± 0.2	0.4	7.599 ± 1.086	2.171	J	51.733666	-176.470805
	FUCU-AS-AST2-1	VEG	7/16/2011	1 ± 0.2	0.3	4.834 ± 0.967	1.45	J	51.745666	-176.507055
	FUCU-AS-AST2-2	VEG	7/16/2011	4.1 ± 0.4	0.4	20.754 ± 2.025	2.025	J	51.745666	-176.507055
	FUCU-AS-AST2-3	VEG	7/16/2011	4.3 ± 0.6	0.4	21.124 ± 2.948	1.965	J	51.745666	-176.507055
	FUCU-AS-AST3-1	VEG	7/14/2011	2.7 ± 0.4	0.5	14.234 ± 2.109	2.636	J	51.688333	-176.63375
	FUCU-AS-AST3-2	VEG	7/14/2011	2.3 ± 0.4	0.4	11.326 ± 1.97	1.97	J	51.688333	-176.63375
	FUCU-AS-AST3-3	VEG	7/14/2011	3.2 ± 0.4	0.3	16.804 ± 2.101	1.575	J	51.688333	-176.63375
	FUCU-AS-DUP	VEG	7/16/2011	2.6 ± 0.2	0.3	13.438 ± 1.034	1.551	J	51.733666	-176.470805
Greenling - whole	GREN-AS-AST1-1	FAUNA	7/15/2011	4.3 ± 1	2.1	20.485 ± 4.764	10.004	J	51.737472	-176.48025
	GREN-AS-AST1-2	FAUNA	7/15/2011	7.4 ± 1.8	2.1	34.913 ± 8.492	9.908		51.737472	-176.48025
	GREN-AS-AST1-3	FAUNA	7/15/2011	2.2 ± 0.6	1.4	10.567 ± 2.882	6.724	J	51.737472	-176.48025
	GREN-AS-AST2-1	FAUNA	7/16/2011	4.4 ± 0.8	1.5	17.673 ± 3.213	6.025	J	51.745666	-176.507055
	GREN-AS-AST2-2	FAUNA	7/16/2011	1.8 ± 0.6	1.3	8.233 ± 2.744	5.946	J	51.745666	-176.507055
	GREN-AS-AST2-3	FAUNA	7/16/2011	4.1 ± 1	2.1	19.095 ± 4.657	9.78	J	51.745666	-176.507055
	GREN-AS-AST3-1	FAUNA	7/14/2011	5.2 ± 1	2.2	24.766 ± 4.763	10.478	J	51.688333	-176.63375
	GREN-AS-AST3-2	FAUNA	7/14/2011	3.5 ± 1	2.7	16.475 ± 4.707	12.709	J	51.688333	-176.63375
	GREN-AS-AST3-3	FAUNA	7/14/2011	3.6 ± 1	2.7	17.193 ± 4.776	12.895	J	51.688333	-176.63375
	GREN-AS-DUP	FAUNA	7/14/2011	3.3 ± 0.8	2	16.548 ± 4.012	10.029	J	51.688333	-176.63375

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Horse Mussel - soft tissue only	HMUS-AS-AST1-1	FAUNA	7/15/2011	11 ± 2	5	55.11 ± 10.02	25.05	J	51.737472	-176.48025
	HMUS-AS-AST2-1	FAUNA	7/16/2011	14 ± 4	5	88.812 ± 25.375	31.719	J	51.745666	-176.507055
	HMUS-AS-AST3-1	FAUNA	7/14/2011	5.6 ± 1.8	4.8	28.551 ± 9.177	24.472	J	51.688333	-176.63375
Irish Lord - whole	IRLO-AS-AST1-1	FAUNA	7/15/2011	-0.1 ± 0.4	1.8	-0.44 ± 1.761	7.925	U	51.737472	-176.48025
	IRLO-AS-AST1-2	FAUNA	7/15/2011	3.9 ± 0.8	1.6	18.184 ± 3.73	7.46	J	51.737472	-176.48025
	IRLO-AS-AST1-3	FAUNA	7/15/2011	1.4 ± 0.6	1.9	6.381 ± 2.735	8.66	U	51.737472	-176.48025
	IRLO-AS-AST2-1	FAUNA	7/16/2011	1.4 ± 0.8	2.5	6.552 ± 3.744	11.7	U	51.745666	-176.507055
	IRLO-AS-AST2-2	FAUNA	7/16/2011	1.5 ± 0.6	1.9	6.386 ± 2.554	8.089	U	51.745666	-176.507055
	IRLO-AS-AST2-3	FAUNA	7/16/2011	0.3 ± 0.6	1.9	1.518 ± 3.035	9.612	U	51.745666	-176.507055
	IRLO-AS-AST3-1	FAUNA	7/14/2011	2.6 ± 0.6	1.7	11.673 ± 2.694	7.632	J	51.688333	-176.63375
	IRLO-AS-AST3-2	FAUNA	7/14/2011	1.9 ± 0.6	1.4	8.028 ± 2.535	5.916	J	51.688333	-176.63375
	IRLO-AS-AST3-3	FAUNA	7/14/2011	1.8 ± 0.6	1.6	8.213 ± 2.738	7.301	J	51.688333	-176.63375
Pacific Cod - whole	PCOD-AS-AS2M-1	FAUNA	7/15/2011	3 ± 0.4	0.3	15.01 ± 2.001	1.501	J	51.737472	-176.48025
Rockfish - whole	ROCK-AS-AST1-1	FAUNA	7/15/2011	6.4 ± 1.2	2.2	23.009 ± 4.314	7.909	J	51.737472	-176.48025
	ROCK-AS-AST1-2	FAUNA	7/15/2011	5.7 ± 1	1.9	21.356 ± 3.747	7.119		51.737472	-176.48025
	ROCK-AS-AST1-3	FAUNA	7/15/2011	2.2 ± 0.4	0.6	9.472 ± 1.722	2.583		51.737472	-176.48025
	ROCK-AS-AST2-1	FAUNA	7/16/2011	1.8 ± 0.6	1.8	6.903 ± 2.301	6.903	U	51.745666	-176.507055
	ROCK-AS-AST2-2	FAUNA	7/16/2011	4 ± 0.6	1.2	14.857 ± 2.229	4.457		51.745666	-176.507055
	ROCK-AS-AST2-3	FAUNA	7/16/2011	3.9 ± 0.8	1.6	15.05 ± 3.087	6.174	J	51.745666	-176.507055
	ROCK-AS-AST3-1	FAUNA	7/14/2011	1.2 ± 0.4	1	4.92 ± 1.64	4.1	J	51.688333	-176.63375
	ROCK-AS-AST3-2	FAUNA	7/14/2011	9.4 ± 2.2	2.4	39.856 ± 9.328	10.176		51.688333	-176.63375
	ROCK-AS-AST3-3	FAUNA	7/14/2011	2.4 ± 0.4	0.5	10.415 ± 1.736	2.17		51.688333	-176.63375
	ROCK-AS-DUP	FAUNA	7/14/2011	1 ± 0.2	0.5	3.915 ± 0.783	1.957	J	51.688333	-176.63375
Sea Urchin - whole	URCH-AS-AST1-1	FAUNA	7/15/2011	1.6 ± 0.6	1.7	6.077 ± 2.279	6.457	U	51.737472	-176.48025
	URCH-AS-AST2-1	FAUNA	7/16/2011	0.3 ± 0.4	1.2	1.211 ± 1.615	4.844	U	51.745666	-176.507055
	URCH-AS-AST3-1	FAUNA	7/14/2011	2.7 ± 0.6	1.6	10.082 ± 2.24	5.975	J	51.688333	-176.63375

Qualifier definitions:
U - Analytical result below detection limit
J - Estimated

Appendix H

Activity Concentration of ^{241}Am

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Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
^{241}Am (pCi/kg)										
Amchitka Site (AMC01)										
Dolly Varden - whole	DOLL-AI-XXX-1	FAUNA	6/24/2011	0.001 ± 0.002	0.002	0.004 ± 0.008	0.008	U	51.468283	179.108052
Goose Egg - no shell	GOOS-AI-XXX-1	FAUNA	6/24/2011	-0.004 ± 0.008	0.04	-0.011 ± 0.021	0.106	U	51.491305	179.0595
Glaucous-winged Gull Egg - no shell	GWGU-AI-XXX-1	FAUNA	6/24/2011	0.008 ± 0.016	0.01	0.028 ± 0.055	0.035	U	51.456388	179.167
Amchitka Site (Long Shot) (AMC02)										
Chiton	CHIT-LS-LT1-1	FAUNA	7/4/2011	0.08 ± 0.04	0.01	0.397 ± 0.198	0.05		51.457555	179.195138
	CHIT-LS-LT2-1	FAUNA	7/3/2011	0.08 ± 0.04	0.006	0.375 ± 0.187	0.028		51.44925	179.205583
	CHIT-LS-LT3-1	FAUNA	7/3/2011	0.14 ± 0.02	0.002	0.667 ± 0.095	0.01		51.43	179.22667
Dragon Kelp	EUAL-LS-DUP	VEG	7/3/2011	0.001 ± 0.002	0.001	0.006 ± 0.012	0.006	U	51.44925	179.205583
	EUAL-LS-LT1-1	VEG	7/4/2011	0.001 ± 0.002	0.002	0.009 ± 0.019	0.019	U	51.457555	179.195138
	EUAL-LS-LT1-2	VEG	7/4/2011	0.004 ± 0.002	0.0004	0.025 ± 0.012	0.002		51.457555	179.195138
	EUAL-LS-LT1-3	VEG	7/4/2011	-0.0007 ± 0.0014	0.004	-0.004 ± 0.008	0.024	UJ	51.457555	179.195138
	EUAL-LS-LT2-1	VEG	7/3/2011	0.023 ± 0.004	0.0009	0.139 ± 0.024	0.005		51.44925	179.205583
	EUAL-LS-LT2-2	VEG	7/3/2011	0.012 ± 0.002	0.0003	0.087 ± 0.015	0.002		51.44925	179.205583
	EUAL-LS-LT2-3	VEG	7/3/2011	0.005 ± 0.004	0.002	0.036 ± 0.029	0.014	U	51.44925	179.205583
	EUAL-LS-LT3-1	VEG	7/2/2011	0.006 ± 0.002	0.0004	0.038 ± 0.013	0.003		51.43	179.22667
	EUAL-LS-LT3-2	VEG	7/2/2011	0.033 ± 0.008	0.001	0.235 ± 0.057	0.007		51.43	179.22667
	EUAL-LS-LT3-3	VEG	7/2/2011	0.007 ± 0.004	0.0008	0.059 ± 0.034	0.007		51.43	179.22667
Rockweed	FUCU-LS-DUP	VEG	6/22/2011	0.001 ± 0.002	0.002	0.005 ± 0.011	0.011	U	51.447472	179.190888
	FUCU-LS-LT1-1	VEG	6/22/2011	0.003 ± 0.002	0.0009	0.016 ± 0.011	0.005		51.447527	179.189361
	FUCU-LS-LT1-2	VEG	6/22/2011	0.003 ± 0.004	0.004	0.018 ± 0.024	0.024	U	51.447527	179.189361
	FUCU-LS-LT1-3	VEG	6/22/2011	0.003 ± 0.002	0.0009	0.02 ± 0.013	0.006		51.448777	179.189305
	FUCU-LS-LT2-1	VEG	6/22/2011	0.0008 ± 0.0012	0.0007	0.006 ± 0.009	0.006	U	51.447222	179.199361
	FUCU-LS-LT2-2	VEG	6/22/2011	0.002 ± 0.002	0.001	0.014 ± 0.014	0.007	U	51.44625	179.196972
	FUCU-LS-LT2-3	VEG	6/22/2011	0.0003 ± 0.0006	0.0009	0.002 ± 0.004	0.006	U	51.446722	179.191888
	FUCU-LS-LT3-1	VEG	7/2/2011	0.002 ± 0.002	0.001	0.01 ± 0.01	0.005	U	51.433611	179.219305
	FUCU-LS-LT3-2	VEG	7/2/2011	0.004 ± 0.002	0.002	0.018 ± 0.009	0.009	J	51.430166	179.218694
	FUCU-LS-LT3-3	VEG	7/2/2011	-0.0004 ± 0.0006	0.002	-0.001 ± 0.002	0.007	U	51.430166	179.218694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-LS-DUP	FAUNA	7/12/2011	0.01 ± 0.02	0.01	0.049 ± 0.097	0.049	U	51.434527	179.234416
	GREN-LS-LT1-1	FAUNA	7/4/2011	0.03 ± 0.02	0.01	0.141 ± 0.094	0.047		51.457555	179.195138
	GREN-LS-LT1-2	FAUNA	7/4/2011	0.02 ± 0.02	0.02	0.095 ± 0.095	0.095	U	51.457555	179.195138
	GREN-LS-LT1-3	FAUNA	7/5/2011	0.005 ± 0.014	0.01	0.023 ± 0.066	0.047	U	51.457555	179.195138
	GREN-LS-LT2-1	FAUNA	7/3/2011	0.009 ± 0.018	0.02	0.043 ± 0.087	0.097	U	51.432194	179.230277
	GREN-LS-LT2-2	FAUNA	7/3/2011	0.01 ± 0.02	0.007	0.046 ± 0.092	0.032	U	51.432194	179.230277
	GREN-LS-LT2-3	FAUNA	7/3/2011	0.005 ± 0.01	0.006	0.024 ± 0.048	0.029	U	51.432194	179.230277
	GREN-LS-LT3-1	FAUNA	7/3/2011	0.005 ± 0.012	0.007	0.022 ± 0.053	0.031	U	51.43	179.22667
	GREN-LS-LT3-2	FAUNA	7/12/2011	0.001 ± 0.016	0.02	0.005 ± 0.078	0.098	U	51.434527	179.234416
	GREN-LS-LT3-3	FAUNA	7/12/2011	0.001 ± 0.014	0.02	0.005 ± 0.068	0.097	U	51.434527	179.234416
Halibut - whole	HALI-LS-L2M-1	FAUNA	7/13/2011	0.001 ± 0.002	0.002	0.004 ± 0.008	0.008	U	51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-LS-LT1-1	FAUNA	7/5/2011	0.11 ± 0.04	0.01	0.471 ± 0.171	0.043		51.457555	179.195138
	HMUS-LS-LT2-1	FAUNA	7/4/2011	0.14 ± 0.02	0.005	0.572 ± 0.082	0.02		51.44925	179.205583
	HMUS-LS-LT3-1	FAUNA	7/3/2011	0.4 ± 0.8	0.8	0.839 ± 1.678	1.678	U	51.44925	179.205583
Irish Lord - whole	IRLO-LS-LT1-1	FAUNA	7/4/2011	0.01 ± 0.02	0.01	0.047 ± 0.094	0.047	U	51.457555	179.195138
	IRLO-LS-LT1-2	FAUNA	7/4/2011	0.02 ± 0.02	0.009	0.095 ± 0.095	0.043	U	51.457555	179.195138
	IRLO-LS-LT1-3	FAUNA	7/5/2011	0.01 ± 0.01	0.004	0.053 ± 0.053	0.021	U	51.457555	179.195138
	IRLO-LS-LT2-1	FAUNA	7/3/2011	0.01 ± 0.02	0.01	0.043 ± 0.087	0.043	U	51.432194	179.230277
	IRLO-LS-LT2-2	FAUNA	7/3/2011	0.05 ± 0.04	0.02	0.207 ± 0.166	0.083	U	51.432194	179.230277
	IRLO-LS-LT2-3	FAUNA	7/3/2011	0.01 ± 0.02	0.02	0.044 ± 0.089	0.089	U	51.432194	179.230277
	IRLO-LS-LT3-1	FAUNA	7/2/2011	0.006 ± 0.004	0.002	0.027 ± 0.018	0.009		51.43	179.22667
	IRLO-LS-LT3-2	FAUNA	7/12/2011	-0.002 ± 0.014	0.02	-0.009 ± 0.066	0.095	U	51.434944	179.2315
	IRLO-LS-LT3-3	FAUNA	7/12/2011	0.009 ± 0.016	0.02	0.05 ± 0.088	0.11	U	51.434944	179.2315
Octopus	OCTP-LS-L2M-1	FAUNA	7/3/2011	0.019 ± 0.002	0.0004	0.135 ± 0.014	0.003		51.44925	179.205583
Pacific Cod - whole	PCOD-LS-L2M-1	FAUNA	7/4/2011	0.003 ± 0.004	0.002	0.015 ± 0.02	0.01	U	51.451805	179.196972
Rockfish - whole	ROCK-LS-DUP	FAUNA	7/12/2011	0.006 ± 0.012	0.02	0.023 ± 0.047	0.078	U	51.434944	179.2315
	ROCK-LS-DUP2	FAUNA	7/12/2011	0.012 ± 0.01	0.004	0.051 ± 0.043	0.017	U	51.465472	179.206722
	ROCK-LS-LT1-1	FAUNA	7/4/2011	0.012 ± 0.016	0.007	0.056 ± 0.074	0.033	U	51.457555	179.195138
	ROCK-LS-LT1-2	FAUNA	7/12/2011	0.013 ± 0.018	0.008	0.054 ± 0.074	0.033	U	51.465472	179.206722
	ROCK-LS-LT1-3	FAUNA	7/12/2011	0.008 ± 0.016	0.01	0.033 ± 0.066	0.041	U	51.465472	179.206722
	ROCK-LS-LT2-1	FAUNA	7/4/2011	0.001 ± 0.012	0.02	0.004 ± 0.048	0.08	UJ	51.44925	179.205583
	ROCK-LS-LT2-2	FAUNA	7/12/2011	0.01 ± 0.02	0.01	0.039 ± 0.079	0.039	U	51.44625	179.223416
	ROCK-LS-LT3-1	FAUNA	7/12/2011	-0.0004 ± 0.0008	0.004	-0.002 ± 0.004	0.018	U	51.434944	179.2315
	ROCK-LS-LT3-2	FAUNA	7/12/2011	-0.004 ± 0.008	0.02	-0.017 ± 0.034	0.085	UJ	51.434944	179.2315
	ROCK-LS-LT3-3	FAUNA	7/3/2011	0.008 ± 0.006	0.003	0.028 ± 0.021	0.01	U	51.43	179.22667

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-LT1-2	VEG	6/22/2011	0.06 ± 0.06	0.03	0.182 ± 0.182	0.091	U	51.447361	179.189111
Sea Urchin - whole	URCH-LS-LT1-1	FAUNA	7/4/2011	0.11 ± 0.04	0.005	0.43 ± 0.156	0.02		51.457555	179.195138
	URCH-LS-LT2-1	FAUNA	7/3/2011	0.09 ± 0.02	0.004	0.346 ± 0.077	0.015		51.44925	179.205583
	URCH-LS-LT3-1	FAUNA	7/2/2011	0.08 ± 0.02	0.004	0.312 ± 0.078	0.016		51.43	179.22667
Amchitka Site (Milrow) (AMC03)										
Chiton	CHIT-ML-MT1-1	FAUNA	7/9/2011	0.07 ± 0.04	0.008	0.264 ± 0.151	0.03		51.408472	179.139166
	CHIT-ML-MT2-1	FAUNA	7/10/2011	0.07 ± 0.02	0.002	0.325 ± 0.093	0.009		51.389416	179.173138
	CHIT-ML-MT3-1	FAUNA	7/10/2011	0.09 ± 0.04	0.006	0.408 ± 0.182	0.027		51.387805	179.184
Dragon Kelp	EUAL-ML-DUP	VEG	7/9/2011	0.003 ± 0.004	0.002	0.023 ± 0.03	0.015	U	51.408472	179.139166
	EUAL-ML-MT1-1	VEG	7/9/2011	0.017 ± 0.002	0.0003	0.136 ± 0.016	0.002		51.408472	179.139166
	EUAL-ML-MT1-2	VEG	7/9/2011	0.009 ± 0.002	0.0004	0.067 ± 0.015	0.003		51.408472	179.139166
	EUAL-ML-MT1-3	VEG	7/9/2011	0.003 ± 0.002	0.001	0.025 ± 0.017	0.008	J	51.408472	179.139166
	EUAL-ML-MT2-1	VEG	7/10/2011	0.009 ± 0.004	0.0008	0.067 ± 0.03	0.006		51.389416	179.173138
	EUAL-ML-MT2-2	VEG	7/10/2011	0.002 ± 0.002	0.002	0.014 ± 0.014	0.014	U	51.389416	179.173138
	EUAL-ML-MT2-3	VEG	7/10/2011	0.0002 ± 0.0018	0.003	0.002 ± 0.014	0.023	U	51.389416	179.173138
	EUAL-ML-MT3-1	VEG	7/10/2011	0.024 ± 0.004	0.0004	0.169 ± 0.028	0.003		51.387805	179.184
	EUAL-ML-MT3-2	VEG	7/10/2011	0.013 ± 0.006	0.001	0.095 ± 0.044	0.007		51.387805	179.184
	EUAL-ML-MT3-3	VEG	7/10/2011	0.025 ± 0.004	0.0006	0.172 ± 0.028	0.004		51.387805	179.184
Rockweed	FUCU-ML-DUP	VEG	6/20/2011	-0.0004 ± 0.0006	0.002	-0.002 ± 0.003	0.009	U	51.412449	179.160843
	FUCU-ML-MT1-1	VEG	6/20/2011	-0.0006 ± 0.0008	0.002	-0.002 ± 0.003	0.008	U	51.412449	179.160843
	FUCU-ML-MT1-2	VEG	6/21/2011	0.001 ± 0.002	0.002	0.006 ± 0.012	0.012	U	51.417083	179.134083
	FUCU-ML-MT1-3	VEG	7/9/2011	0.0006 ± 0.001	0.0006	0.003 ± 0.005	0.003	U	51.417083	179.134083
	FUCU-ML-MT2-1	VEG	6/20/2011	-0.0002 ± 0.0004	0.001	-0.001 ± 0.002	0.005	U	51.403305	179.167166
	FUCU-ML-MT2-2	VEG	6/21/2011	-0.002 ± 0.004	0.006	-0.014 ± 0.028	0.042	UJ	51.405694	179.161361
	FUCU-ML-MT2-3	VEG	6/21/2011	0.002 ± 0.004	0.004	0.014 ± 0.028	0.028	UJ	51.405694	179.161361
	FUCU-ML-MT3-1	VEG	7/10/2011	0.002 ± 0.002	0.001	0.01 ± 0.01	0.005	U	51.389416	179.173138
	FUCU-ML-MT3-2	VEG	7/10/2011	0.011 ± 0.004	0.0006	0.053 ± 0.019	0.003		51.389416	179.173138
	FUCU-ML-MT3-3	VEG	7/10/2011	-0.0008 ± 0.0016	0.005	-0.004 ± 0.008	0.025	UJ	51.389416	179.173138

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-ML-DUP	FAUNA	7/10/2011	0.02 ± 0.02	0.007	0.097 ± 0.097	0.034	U	51.387805	179.184
	GREN-ML-MT1-1	FAUNA	7/9/2011	0.005 ± 0.004	0.002	0.022 ± 0.017	0.009	U	51.408472	179.139166
	GREN-ML-MT1-2	FAUNA	7/9/2011	0.01 ± 0.02	0.01	0.046 ± 0.093	0.046	U	51.408472	179.139166
	GREN-ML-MT1-3	FAUNA	7/9/2011	-0.001 ± 0.002	0.01	-0.005 ± 0.01	0.048	U	51.408472	179.139166
	GREN-ML-MT2-1	FAUNA	7/11/2011	0.03 ± 0.02	0.006	0.14 ± 0.093	0.028		51.396944	179.1435
	GREN-ML-MT2-2	FAUNA	7/11/2011	0.02 ± 0.02	0.005	0.094 ± 0.094	0.023	U	51.396944	179.1435
	GREN-ML-MT2-3	FAUNA	7/11/2011	0.02 ± 0.02	0.005	0.095 ± 0.095	0.024	U	51.396944	179.1435
	GREN-ML-MT3-1	FAUNA	7/10/2011	0.01 ± 0.02	0.005	0.048 ± 0.097	0.024	U	51.387805	179.184
	GREN-ML-MT3-2	FAUNA	7/10/2011	0.05 ± 0.04	0.02	0.241 ± 0.193	0.096	U	51.387805	179.184
	GREN-ML-MT3-3	FAUNA	7/10/2011	0.034 ± 0.008	0.002	0.161 ± 0.038	0.009		51.387805	179.184
Halibut - whole	HALI-ML-M2M-1	FAUNA	7/11/2011	0.0006 ± 0.0018	0.001	0.002 ± 0.006	0.003	U	51.365055	179.111472
Horse Mussel - soft tissue only	HMUS-ML-MT1-1	FAUNA	7/9/2011	0.11 ± 0.04	0.01	0.5 ± 0.182	0.045		51.408472	179.139166
	HMUS-ML-MT2-1	FAUNA	7/11/2011	0.21 ± 0.08	0.01	0.944 ± 0.36	0.045		51.389416	179.173138
	HMUS-ML-MT3-1	FAUNA	7/10/2011	0.07 ± 0.08	0.04	0.321 ± 0.367	0.184	U	51.387805	179.184
Irish Lord - whole	IRLO-ML-MT1-1	FAUNA	7/9/2011	0.004 ± 0.01	0.01	0.017 ± 0.043	0.043	U	51.408472	179.139166
	IRLO-ML-MT1-2	FAUNA	7/9/2011	0.02 ± 0.02	0.01	0.095 ± 0.095	0.047	U	51.408472	179.139166
	IRLO-ML-MT1-3	FAUNA	7/9/2011	0.012 ± 0.014	0.007	0.056 ± 0.066	0.033	U	51.408472	179.139166
	IRLO-ML-MT2-1	FAUNA	7/10/2011	0.003 ± 0.006	0.01	0.013 ± 0.026	0.043	U	51.389416	179.173138
	IRLO-ML-MT2-2	FAUNA	7/11/2011	0.009 ± 0.016	0.008	0.039 ± 0.069	0.034	U	51.396944	179.1435
	IRLO-ML-MT2-3	FAUNA	7/11/2011	0.005 ± 0.014	0.01	0.024 ± 0.066	0.047	U	51.396944	179.1435
	IRLO-ML-MT3-1	FAUNA	7/10/2011	0.02 ± 0.02	0.02	0.113 ± 0.113	0.113	U	51.387805	179.184
	IRLO-ML-MT3-2	FAUNA	7/10/2011	0.03 ± 0.02	0.01	0.145 ± 0.097	0.048		51.387805	179.184
	IRLO-ML-MT3-3	FAUNA	7/10/2011	0.01 ± 0.02	0.008	0.056 ± 0.112	0.045	U	51.387805	179.184
Octopus	OCTP-ML-M2M-1	FAUNA	7/10/2011	0.009 ± 0.012	0.007	0.042 ± 0.057	0.033	U	51.389416	179.173138
Pacific Cod - whole	PCOD-ML-M2M-1	FAUNA	7/10/2011	0.001 ± 0.002	0.001	0.005 ± 0.011	0.005	U	51.408472	179.139166
Rockfish - whole	ROCK-ML-DUP	FAUNA	7/9/2011	0.004 ± 0.012	0.01	0.018 ± 0.053	0.044	U	51.408472	179.139166
	ROCK-ML-MT1-1	FAUNA	7/9/2011	0.004 ± 0.008	0.004	0.018 ± 0.035	0.018	U	51.408472	179.139166
	ROCK-ML-MT1-2	FAUNA	7/9/2011	0.011 ± 0.012	0.009	0.048 ± 0.053	0.04	U	51.408472	179.139166
	ROCK-ML-MT1-3	FAUNA	7/9/2011	-0.001 ± 0.002	0.01	-0.004 ± 0.008	0.042	U	51.408472	179.139166
	ROCK-ML-MT2-1	FAUNA	7/11/2011	-0.0008 ± 0.0012	0.007	-0.003 ± 0.005	0.026	U	51.365055	179.111472
	ROCK-ML-MT2-2	FAUNA	7/11/2011	0.07 ± 0.04	0.009	0.283 ± 0.162	0.036		51.365055	179.111472
	ROCK-ML-MT2-3	FAUNA	7/11/2011	0.008 ± 0.012	0.005	0.036 ± 0.054	0.023	U	51.365055	179.111472
	ROCK-ML-MT3-1	FAUNA	7/10/2011	0.009 ± 0.006	0.004	0.042 ± 0.028	0.019	J	51.387805	179.184
	ROCK-ML-MT3-2	FAUNA	7/10/2011	0.002 ± 0.008	0.01	0.007 ± 0.029	0.036	U	51.387805	179.184
	ROCK-ML-MT3-3	FAUNA	7/10/2011	0.004 ± 0.006	0.004	0.009 ± 0.014	0.009	U	51.387805	179.184

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-ML-1	VEG	6/21/2011	0.03 ± 0.02	0.007	0.107 ± 0.072	0.025		51.402583	179.183972
Sea Urchin - whole	URCH-ML-MT1-1	FAUNA	7/9/2011	0.15 ± 0.02	0.002	0.556 ± 0.074	0.007		51.408472	179.139166
	URCH-ML-MT2-1	FAUNA	7/10/2011	0.08 ± 0.04	0.005	0.299 ± 0.149	0.019		51.389416	179.173138
	URCH-ML-MT3-1	FAUNA	7/10/2011	0.12 ± 0.06	0.009	0.476 ± 0.238	0.036		51.387805	179.184
Amchitka Site (Cannikin) (AMC05)										
Chiton	CHIT-CN-CT1-1	FAUNA	7/8/2011	0.05 ± 0.04	0.01	0.234 ± 0.187	0.047	U	51.482972	179.123833
	CHIT-CN-CT2-1	FAUNA	7/7/2011	0.07 ± 0.02	0.004	0.331 ± 0.095	0.019		51.472611	179.151111
	CHIT-CN-CT3-1	FAUNA	7/5/2011	0.11 ± 0.04	0.005	0.54 ± 0.196	0.025		51.471416	179.172861
Dragon Kelp	EUAL-CN-CT1-1	VEG	7/8/2011	0.009 ± 0.004	0.001	0.067 ± 0.03	0.007		51.482972	179.123833
	EUAL-CN-CT1-2	VEG	7/8/2011	0.0005 ± 0.001	0.002	0.003 ± 0.007	0.013	U	51.482972	179.123833
	EUAL-CN-CT1-3	VEG	7/8/2011	0.016 ± 0.004	0.0004	0.098 ± 0.025	0.002		51.482972	179.123833
	EUAL-CN-CT2-1	VEG	7/6/2011	0.01 ± 0.002	0.0005	0.064 ± 0.013	0.003		51.472611	179.151111
	EUAL-CN-CT2-2	VEG	7/6/2011	0.02 ± 0.004	0.0006	0.126 ± 0.025	0.004		51.472611	179.151111
	EUAL-CN-CT2-3	VEG	7/7/2011	0.018 ± 0.004	0.0005	0.13 ± 0.029	0.004		51.472611	179.151111
	EUAL-CN-CT3-1	VEG	7/5/2011	0.023 ± 0.004	0.0008	0.16 ± 0.028	0.006		51.471416	179.172861
	EUAL-CN-CT3-2	VEG	7/5/2011	0.0009 ± 0.0016	0.002	0.006 ± 0.012	0.014	U	51.471416	179.172861
	EUAL-CN-CT3-3	VEG	7/5/2011	0.029 ± 0.004	0.0003	0.188 ± 0.026	0.002		51.471416	179.172861
	EUAL-CN-DUP	VEG	7/6/2011	0.005 ± 0.004	0.0014	0.033 ± 0.027	0.009	U	51.471416	179.172861
Rockweed	FUCU-CN-CT1-1	VEG	6/23/2011	0.0006 ± 0.0012	0.002	0.003 ± 0.007	0.012	U	51.481888	179.118138
	FUCU-CN-CT1-2	VEG	6/23/2011	0.0007 ± 0.0024	0.002	0.004 ± 0.015	0.013	U	51.481888	179.118138
	FUCU-CN-CT1-3	VEG	6/23/2011	0.002 ± 0.002	0.0005	0.012 ± 0.012	0.003	U	51.481888	179.118138
	FUCU-CN-CT2-1	VEG	7/8/2011	0.002 ± 0.004	0.004	0.008 ± 0.017	0.017	UJ	51.476638	179.135277
	FUCU-CN-CT2-2	VEG	7/8/2011	0.004 ± 0.004	0.001	0.018 ± 0.018	0.004	U	51.476638	179.135277
	FUCU-CN-CT2-3	VEG	7/12/2011	0.005 ± 0.002	0.0006	0.026 ± 0.011	0.003		51.467583	179.153583
	FUCU-CN-CT3-1	VEG	7/6/2011	0.005 ± 0.004	0.001	0.027 ± 0.022	0.005	U	51.465027	179.173166
	FUCU-CN-CT3-2	VEG	7/6/2011	0.004 ± 0.002	0.0007	0.023 ± 0.012	0.004		51.465472	179.170583
	FUCU-CN-CT3-3	VEG	7/6/2011	-0.0001 ± 0.0002	0.001	-0.001 ± 0.001	0.006	U	51.464638	179.159305
	FUCU-CN-DUP	VEG	6/23/2011	0.001 ± 0.002	0.001	0.006 ± 0.013	0.006	U	51.481888	179.118138

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-CN-CT1-1	FAUNA	7/8/2011	0.02 ± 0.02	0.006	0.096 ± 0.096	0.029	U	51.482972	179.123833
	GREN-CN-CT1-2	FAUNA	7/8/2011	0.01 ± 0.02	0.007	0.047 ± 0.095	0.033	U	51.482972	179.123833
	GREN-CN-CT1-3	FAUNA	7/8/2011	0.005 ± 0.008	0.004	0.023 ± 0.036	0.018	U	51.482972	179.123833
	GREN-CN-CT2-1	FAUNA	7/7/2011	0.003 ± 0.006	0.005	0.015 ± 0.029	0.024	U	51.472611	179.151111
	GREN-CN-CT2-2	FAUNA	7/7/2011	0.01 ± 0.02	0.004	0.046 ± 0.092	0.018	U	51.472611	179.151111
	GREN-CN-CT2-3	FAUNA	7/7/2011	0.005 ± 0.006	0.003	0.023 ± 0.028	0.014	U	51.472611	179.151111
	GREN-CN-CT3-1	FAUNA	7/5/2011	0.01 ± 0.02	0.005	0.046 ± 0.091	0.023	U	51.471416	179.172861
	GREN-CN-CT3-2	FAUNA	7/5/2011	0.02 ± 0.02	0.01	0.087 ± 0.087	0.044	U	51.471416	179.172861
	GREN-CN-CT3-3	FAUNA	7/5/2011	0.01 ± 0.02	0.004	0.046 ± 0.092	0.018	U	51.471416	179.172861
	GREN-CN-DUP	FAUNA	7/8/2011	0.03 ± 0.02	0.007	0.145 ± 0.096	0.034		51.482972	179.123833
Halibut - whole	HALI-CN-C2M-1	FAUNA	7/13/2011	0.001 ± 0.002	0.001	0.004 ± 0.008	0.004	U	51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-CN-CT1-1	FAUNA	7/8/2011	0.02 ± 0.04	0.06	0.082 ± 0.164	0.247	U	51.482972	179.123833
	HMUS-CN-CT2-1	FAUNA	7/7/2011	0.12 ± 0.06	0.02	0.544 ± 0.272	0.091		51.472611	179.151111
	HMUS-CN-CT3-1	FAUNA	7/5/2011	0.11 ± 0.06	0.01	0.451 ± 0.246	0.041		51.471416	179.172861
Irish Lord - whole	IRLO-CN-CT1-1	FAUNA	7/8/2011	0.013 ± 0.008	0.005	0.059 ± 0.036	0.023	J	51.482972	179.123833
	IRLO-CN-CT1-2	FAUNA	7/8/2011	0.01 ± 0.02	0.01	0.05 ± 0.1	0.05	U	51.482972	179.123833
	IRLO-CN-CT1-3	FAUNA	7/8/2011	0.004 ± 0.012	0.009	0.019 ± 0.056	0.042	U	51.482972	179.123833
	IRLO-CN-CT2-1	FAUNA	7/7/2011	0.011 ± 0.01	0.009	0.052 ± 0.047	0.042	U	51.472611	179.151111
	IRLO-CN-CT2-2	FAUNA	7/7/2011	0.01 ± 0.02	0.02	0.046 ± 0.091	0.091	U	51.472611	179.151111
	IRLO-CN-CT2-3	FAUNA	7/7/2011	0.006 ± 0.008	0.005	0.03 ± 0.039	0.025	U	51.472611	179.151111
	IRLO-CN-CT3-1	FAUNA	7/5/2011	0.014 ± 0.016	0.01	0.072 ± 0.082	0.052	U	51.471416	179.172861
	IRLO-CN-CT3-2	FAUNA	7/5/2011	0.006 ± 0.008	0.005	0.029 ± 0.039	0.024	U	51.471416	179.172861
	IRLO-CN-CT3-3	FAUNA	7/5/2011	-0.001 ± 0.002	0.006	-0.005 ± 0.01	0.029	U	51.471416	179.172861
Octopus	OCTP-CN-C2M-1	FAUNA	7/8/2011	0.017 ± 0.01	0.003	0.083 ± 0.049	0.015		51.482972	179.123833
Pacific Cod - whole	PCOD-CN-C2M-1	FAUNA	7/6/2011	0.0004 ± 0.0016	0.0019	0.002 ± 0.007	0.009	U	51.483527	179.187583
Rockfish - whole	ROCK-CN-CT1-1	FAUNA	7/8/2011	-0.002 ± 0.004	0.012	-0.008 ± 0.016	0.047	U	51.482972	179.123833
	ROCK-CN-CT1-2	FAUNA	7/8/2011	0.007 ± 0.01	0.01	0.027 ± 0.039	0.039	U	51.482972	179.123833
	ROCK-CN-CT1-3	FAUNA	7/8/2011	0.03 ± 0.02	0.03	0.121 ± 0.08	0.121	J	51.482972	179.123833
	ROCK-CN-CT2-1	FAUNA	7/6/2011	0.001 ± 0.004	0.003	0.004 ± 0.014	0.011	U	51.472611	179.151111
	ROCK-CN-CT2-2	FAUNA	7/6/2011	0.004 ± 0.008	0.02	0.015 ± 0.029	0.073	U	51.472611	179.151111
	ROCK-CN-CT2-3	FAUNA	7/6/2011	0.004 ± 0.006	0.003	0.016 ± 0.025	0.012	U	51.472611	179.151111
	ROCK-CN-CT3-1	FAUNA	7/6/2011	0.01 ± 0.016	0.01	0.043 ± 0.068	0.043	U	51.471416	179.172861
	ROCK-CN-CT3-2	FAUNA	7/6/2011	0.006 ± 0.01	0.004	0.023 ± 0.038	0.015	U	51.471416	179.172861
	ROCK-CN-CT3-3	FAUNA	7/6/2011	0.01 ± 0.01	0.005	0.042 ± 0.042	0.021	U	51.471416	179.172861
	ROCK-CN-DUP	FAUNA	7/6/2011	0.003 ± 0.006	0.004	0.012 ± 0.024	0.016	U	51.471416	179.172861

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-CT1-1	VEG	6/23/2011	-0.001 ± 0.002	0.01	-0.002 ± 0.003	0.016	U	51.480583	179.109472
Sea Urchin - whole	URCH-CN-CT1-1	FAUNA	7/8/2011	0.2 ± 0.04	0.003	0.802 ± 0.16	0.012		51.482972	179.123833
	URCH-CN-CT2-1	FAUNA	7/7/2011	0.1 ± 0.08	0.01	0.343 ± 0.274	0.034	U	51.472611	179.151111
	URCH-CN-CT3-1	FAUNA	7/5/2011	0.11 ± 0.04	0.004	0.421 ± 0.153	0.015		51.471416	179.172861
Amchitka Site (Adak Island) (AMC13)										
Dolly Varden - whole	DOLL-AD-XXX-1	FAUNA	6/28/2011	0.003 ± 0.004	0.002	0.012 ± 0.016	0.008	U	51.8375	-176.672555
Reindeer Lichen	STRL-AD-XXX-1	VEG	6/28/2011	0.12 ± 0.04	0.004	0.235 ± 0.078	0.008		51.837527	-176.670694
	STRL-AD-XXX-2	VEG	6/29/2011	0.04 ± 0.02	0.008	0.099 ± 0.049	0.02		51.872833	-176.707444
	STRL-AD-XXX-3	VEG	6/29/2011	0.1 ± 0.04	0.008	0.159 ± 0.064	0.013		51.900805	-176.688527
Amchitka Site (Adak Island North) (AMC14)										
Chiton	CHIT-AN-ANT1-1	FAUNA	7/20/2011	0.08 ± 0.02	0.003	0.39 ± 0.097	0.015		51.838722	-176.582805
	CHIT-AN-ANT2-1	FAUNA	7/18/2011	0.04 ± 0.04	0.02	0.2 ± 0.2	0.1	U	51.848361	-176.506277
	CHIT-AN-ANT3-1	FAUNA	7/17/2011	0.01 ± 0.02	0.02	0.051 ± 0.102	0.102	U	51.853722	-176.470694
Dragon Kelp	EUAL-AN-ANT1-1	VEG	7/19/2011	0.009 ± 0.002	0.0006	0.075 ± 0.017	0.005		51.835694	-176.542138
	EUAL-AN-ANT1-2	VEG	7/19/2011	0.006 ± 0.002	0.0008	0.041 ± 0.014	0.005		51.835694	-176.542138
	EUAL-AN-ANT1-3	VEG	7/19/2011	0.01 ± 0.002	0.0004	0.077 ± 0.015	0.003		51.835694	-176.542138
	EUAL-AN-ANT2-1	VEG	7/18/2011	0.011 ± 0.002	0.0003	0.08 ± 0.015	0.002		51.848361	-176.506277
	EUAL-AN-ANT2-2	VEG	7/18/2011	0.011 ± 0.002	0.0005	0.07 ± 0.013	0.003		51.848361	-176.506277
	EUAL-AN-ANT2-3	VEG	7/18/2011	0.009 ± 0.002	0.0005	0.063 ± 0.014	0.003		51.848361	-176.506277
	EUAL-AN-ANT3-1	VEG	7/17/2011	0.0007 ± 0.0016	0.002	0.005 ± 0.012	0.015	U	51.853722	-176.470694
	EUAL-AN-ANT3-2	VEG	7/17/2011	0.026 ± 0.004	0.0004	0.177 ± 0.027	0.003		51.853722	-176.470694
	EUAL-AN-ANT3-3	VEG	7/17/2011	0.006 ± 0.004	0.001	0.04 ± 0.027	0.007		51.853722	-176.470694
	EUAL-AN-DUP	VEG	7/17/2011	0.002 ± 0.004	0.007	0.013 ± 0.025	0.044	UJ	51.853722	-176.470694
Rockweed	FUCU-AN-ANT1-1	VEG	7/19/2011	0.007 ± 0.004	0.0006	0.036 ± 0.02	0.003		51.841444	-176.546083
	FUCU-AN-ANT1-2	VEG	7/20/2011	0.004 ± 0.006	0.005	0.026 ± 0.039	0.032	UJ	51.8395	-176.591305
	FUCU-AN-ANT1-3	VEG	7/20/2011	0.001 ± 0.002	0.003	0.005 ± 0.011	0.016	U	51.8395	-176.591305
	FUCU-AN-ANT2-1	VEG	7/18/2011	0.009 ± 0.004	0.001	0.057 ± 0.025	0.006		51.837666	-176.517527
	FUCU-AN-ANT2-2	VEG	7/18/2011	0.003 ± 0.004	0.0014	0.016 ± 0.021	0.007	U	51.841444	-176.546083
	FUCU-AN-ANT2-3	VEG	7/18/2011	0.001 ± 0.002	0.002	0.004 ± 0.008	0.008	U	51.8395	-176.591305
	FUCU-AN-ANT3-1	VEG	7/18/2011	0.015 ± 0.008	0.002	0.086 ± 0.046	0.011		51.839944	-176.515916
	FUCU-AN-ANT3-2	VEG	7/18/2011	0.002 ± 0.002	0.002	0.01 ± 0.01	0.01	U	51.828972	-176.448305
	FUCU-AN-ANT3-3	VEG	7/18/2011	0.0005 ± 0.002	0.003	0.002 ± 0.01	0.015	U	51.830833	-176.456361
	FUCU-AN-DUP	VEG	7/18/2011	0.0004 ± 0.001	0.001	0.002 ± 0.005	0.005	U	51.828972	-176.448305

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-AN-ANT1-1	FAUNA	7/19/2011	0.02 ± 0.04	0.03	0.089 ± 0.178	0.133	U	51.835694	-176.542138
	GREN-AN-ANT1-2	FAUNA	7/19/2011	0.01 ± 0.02	0.02	0.042 ± 0.084	0.084	U	51.835694	-176.542138
	GREN-AN-ANT1-3	FAUNA	7/19/2011	0.008 ± 0.016	0.02	0.029 ± 0.058	0.073	U	51.835694	-176.542138
	GREN-AN-ANT2-1	FAUNA	7/18/2011	0.033 ± 0.01	0.003	0.153 ± 0.046	0.014		51.848361	-176.506277
	GREN-AN-ANT2-2	FAUNA	7/18/2011	0.009 ± 0.004	0.002	0.042 ± 0.019	0.009		51.848361	-176.506277
	GREN-AN-ANT2-3	FAUNA	7/18/2011	0.004 ± 0.008	0.02	0.019 ± 0.038	0.095	U	51.848361	-176.506277
	GREN-AN-ANT3-1	FAUNA	7/17/2011	0.012 ± 0.01	0.007	0.055 ± 0.046	0.032		51.853722	-176.470694
	GREN-AN-ANT3-2	FAUNA	7/17/2011	0.03 ± 0.04	0.02	0.139 ± 0.186	0.093	U	51.853722	-176.470694
	GREN-AN-ANT3-3	FAUNA	7/17/2011	0.006 ± 0.016	0.01	0.028 ± 0.074	0.047	U	51.853722	-176.470694
	GREN-AN-DUP	FAUNA	7/17/2011	0.02 ± 0.02	0.006	0.095 ± 0.095	0.029	U	51.853722	-176.470694
Halibut - whole	HALI-AN-AN2M-1	FAUNA	7/17/2011	0.0005 ± 0.0014	0.001	0.002 ± 0.005	0.003	U	51.853722	-176.470694
	HALI-AN-DUP	FAUNA	7/17/2011	0.0007 ± 0.0022	0.002	0.002 ± 0.007	0.007	U	51.853722	-176.470694
Horse Mussel - soft tissue only	HMUS-AN-ANT1-1	FAUNA	7/20/2011	0.09 ± 0.06	0.01	0.492 ± 0.328	0.055		51.838722	-176.582805
	HMUS-AN-ANT2-1	FAUNA	7/18/2011	0.07 ± 0.08	0.04	0.321 ± 0.367	0.184	U	51.848361	-176.506277
	HMUS-AN-ANT3-1	FAUNA	7/18/2011	0.03 ± 0.04	0.01	0.134 ± 0.178	0.045	U	51.853722	-176.470694
Irish Lord - whole	IRLO-AN-ANT1-1	FAUNA	7/19/2011	0.02 ± 0.02	0.004	0.094 ± 0.094	0.019	U	51.835694	-176.542138
	IRLO-AN-ANT1-2	FAUNA	7/19/2011	0.007 ± 0.01	0.006	0.031 ± 0.044	0.027	U	51.835694	-176.542138
	IRLO-AN-ANT1-3	FAUNA	7/19/2011	0.02 ± 0.02	0.008	0.088 ± 0.088	0.035	U	51.835694	-176.542138
	IRLO-AN-ANT2-1	FAUNA	7/19/2011	0.01 ± 0.02	0.005	0.047 ± 0.095	0.024	U	51.848361	-176.506277
	IRLO-AN-ANT2-2	FAUNA	7/19/2011	0.01 ± 0.02	0.01	0.046 ± 0.093	0.046	U	51.848361	-176.506277
	IRLO-AN-ANT2-3	FAUNA	7/19/2011	0.005 ± 0.01	0.009	0.024 ± 0.048	0.043	U	51.848361	-176.506277
	IRLO-AN-ANT3-1	FAUNA	7/17/2011	0.005 ± 0.01	0.01	0.024 ± 0.048	0.048	U	51.853722	-176.470694
	IRLO-AN-ANT3-2	FAUNA	7/17/2011	0.01 ± 0.02	0.01	0.045 ± 0.09	0.045	U	51.853722	-176.470694
	IRLO-AN-ANT3-3	FAUNA	7/17/2011	0.01 ± 0.02	0.01	0.045 ± 0.09	0.045	U	51.853722	-176.470694
Octopus	OCTP-AN-AN2M-1	FAUNA	7/18/2011	0.015 ± 0.006	0.002	0.076 ± 0.03	0.01		51.848361	-176.506277
Pacific Cod - whole	PCOD-AN-AN2M-1	FAUNA	7/17/2011	0.0005 ± 0.001	0.0009	0.002 ± 0.005	0.004	U	51.853722	-176.470694
Rockfish - whole	ROCK-AN-ANT1-1	FAUNA	7/19/2011	0.006 ± 0.01	0.005	0.022 ± 0.037	0.018	U	51.835694	-176.542138
	ROCK-AN-ANT2-1	FAUNA	7/18/2011	0.001 ± 0.002	0.003	0.004 ± 0.007	0.011	U	51.848361	-176.506277
	ROCK-AN-ANT2-2	FAUNA	7/18/2011	0.003 ± 0.008	0.007	0.012 ± 0.033	0.029	U	51.848361	-176.506277
	ROCK-AN-ANT3-1	FAUNA	7/17/2011	-0.001 ± 0.002	0.005	-0.004 ± 0.007	0.018	U	51.853722	-176.470694
	ROCK-AN-ANT3-2	FAUNA	7/17/2011	0.006 ± 0.006	0.008	0.023 ± 0.023	0.031	U	51.853722	-176.470694
	ROCK-AN-ANT3-3	FAUNA	7/17/2011	0.02 ± 0.02	0.006	0.079 ± 0.079	0.024	U	51.853722	-176.470694
Sea Urchin - whole	URCH-AN-ANT1-1	FAUNA	7/19/2011	0.03 ± 0.04	0.03	0.102 ± 0.136	0.102	UJ	51.835694	-176.542138
	URCH-AN-ANT2-1	FAUNA	7/18/2011	0.08 ± 0.04	0.007	0.291 ± 0.146	0.026		51.848361	-176.506277
	URCH-AN-ANT3-1	FAUNA	7/17/2011	0.07 ± 0.02	0.003	0.266 ± 0.076	0.011		51.853722	-176.470694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Amchitka Site (Adak Island South) (AMC15)										
Chiton	CHIT-AS-AST1-1	FAUNA	7/15/2011	0.06 ± 0.02	0.003	0.247 ± 0.082	0.012		51.737472	-176.48025
	CHIT-AS-AST2-1	FAUNA	7/16/2011	0.017 ± 0.006	0.002	0.087 ± 0.031	0.01		51.745666	-176.507055
	CHIT-AS-AST3-1	FAUNA	7/14/2011	0.07 ± 0.02	0.005	0.33 ± 0.094	0.024		51.688333	-176.63375
Dragon Kelp	EUAL-AS-AST1-1	VEG	7/15/2011	0.006 ± 0.004	0.002	0.04 ± 0.026	0.013		51.737472	-176.48025
	EUAL-AS-AST1-2	VEG	7/15/2011	0.008 ± 0.002	0.0007	0.064 ± 0.016	0.006		51.737472	-176.48025
	EUAL-AS-AST1-3	VEG	7/15/2011	0.008 ± 0.004	0.0006	0.077 ± 0.038	0.006		51.737472	-176.48025
	EUAL-AS-AST2-1	VEG	7/16/2011	0.015 ± 0.002	0.0002	0.107 ± 0.014	0.001		51.745666	-176.507055
	EUAL-AS-AST2-2	VEG	7/16/2011	0.027 ± 0.004	0.0006	0.191 ± 0.028	0.004		51.745666	-176.507055
	EUAL-AS-AST2-3	VEG	7/16/2011	0.0007 ± 0.0018	0.002	0.005 ± 0.013	0.015	U	51.745666	-176.507055
	EUAL-AS-AST3-1	VEG	7/14/2011	0.009 ± 0.002	0.0006	0.066 ± 0.015	0.004		51.688333	-176.63375
	EUAL-AS-AST3-2	VEG	7/14/2011	0.006 ± 0.004	0.002	0.057 ± 0.038	0.019		51.688333	-176.63375
	EUAL-AS-AST3-3	VEG	7/14/2011	0.004 ± 0.004	0.002	0.035 ± 0.035	0.018	U	51.688333	-176.63375
	EUAL-AS-DUP	VEG	7/14/2011	0.008 ± 0.004	0.0006	0.059 ± 0.029	0.004		51.688333	-176.63375
Rockweed	FUCU-AS-AST1-1	VEG	7/16/2011	0.007 ± 0.006	0.003	0.043 ± 0.037	0.019	U	51.733666	-176.470805
	FUCU-AS-AST1-2	VEG	7/16/2011	0.01 ± 0.006	0.004	0.055 ± 0.033	0.022	J	51.733666	-176.470805
	FUCU-AS-AST1-3	VEG	7/16/2011	0.008 ± 0.004	0.0006	0.043 ± 0.022	0.003		51.733666	-176.470805
	FUCU-AS-AST2-1	VEG	7/16/2011	0.006 ± 0.002	0.0005	0.029 ± 0.01	0.002		51.745666	-176.507055
	FUCU-AS-AST2-2	VEG	7/16/2011	0.0007 ± 0.0012	0.0007	0.004 ± 0.006	0.004	U	51.745666	-176.507055
	FUCU-AS-AST2-3	VEG	7/16/2011	0.004 ± 0.004	0.002	0.02 ± 0.02	0.01	U	51.745666	-176.507055
	FUCU-AS-AST3-1	VEG	7/14/2011	0.015 ± 0.004	0.0007	0.079 ± 0.021	0.004		51.688333	-176.63375
	FUCU-AS-AST3-2	VEG	7/14/2011	0.002 ± 0.002	0.001	0.01 ± 0.01	0.005	U	51.688333	-176.63375
	FUCU-AS-AST3-3	VEG	7/14/2011	0.0009 ± 0.0012	0.001	0.005 ± 0.006	0.005	U	51.688333	-176.63375
	FUCU-AS-DUP	VEG	7/16/2011	0.006 ± 0.004	0.002	0.031 ± 0.021	0.01		51.733666	-176.470805
Greenling - whole	GREN-AS-AST1-1	FAUNA	7/15/2011	0.005 ± 0.01	0.008	0.024 ± 0.048	0.038	U	51.737472	-176.48025
	GREN-AS-AST1-2	FAUNA	7/15/2011	0.008 ± 0.016	0.01	0.038 ± 0.075	0.047	U	51.737472	-176.48025
	GREN-AS-AST1-3	FAUNA	7/15/2011	0.02 ± 0.02	0.02	0.096 ± 0.096	0.096	U	51.737472	-176.48025
	GREN-AS-AST2-1	FAUNA	7/16/2011	0.01 ± 0.02	0.006	0.04 ± 0.08	0.024	U	51.745666	-176.507055
	GREN-AS-AST2-2	FAUNA	7/16/2011	0.002 ± 0.004	0.008	0.009 ± 0.018	0.037	U	51.745666	-176.507055
	GREN-AS-AST2-3	FAUNA	7/16/2011	0.01 ± 0.02	0.009	0.047 ± 0.093	0.042	U	51.745666	-176.507055
	GREN-AS-AST3-1	FAUNA	7/14/2011	0.007 ± 0.012	0.007	0.033 ± 0.057	0.033	U	51.688333	-176.63375
	GREN-AS-AST3-2	FAUNA	7/14/2011	0.01 ± 0.02	0.02	0.047 ± 0.094	0.094	U	51.688333	-176.63375
	GREN-AS-AST3-3	FAUNA	7/14/2011	0.02 ± 0.02	0.005	0.096 ± 0.096	0.024	U	51.688333	-176.63375
	GREN-AS-DUP	FAUNA	7/14/2011	0.009 ± 0.012	0.007	0.045 ± 0.06	0.035	U	51.688333	-176.63375

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Horse Mussel - soft tissue only	HMUS-AS-AST1-1	FAUNA	7/15/2011	0.07 ± 0.1	0.05	0.351 ± 0.501	0.25	U	51.737472	-176.48025
	HMUS-AS-AST2-1	FAUNA	7/16/2011	0.03 ± 0.06	0.04	0.19 ± 0.381	0.254	U	51.745666	-176.507055
	HMUS-AS-AST3-1	FAUNA	7/14/2011	0.15 ± 0.04	0.009	0.765 ± 0.204	0.046		51.688333	-176.63375
Irish Lord - whole	IRLO-AS-AST1-1	FAUNA	7/15/2011	0.02 ± 0.02	0.006	0.088 ± 0.088	0.026	U	51.737472	-176.48025
	IRLO-AS-AST1-2	FAUNA	7/15/2011	0.03 ± 0.04	0.01	0.14 ± 0.187	0.047	U	51.737472	-176.48025
	IRLO-AS-AST1-3	FAUNA	7/15/2011	0.009 ± 0.014	0.008	0.041 ± 0.064	0.036	U	51.737472	-176.48025
	IRLO-AS-AST2-1	FAUNA	7/16/2011	0.01 ± 0.02	0.01	0.047 ± 0.094	0.047	U	51.745666	-176.507055
	IRLO-AS-AST2-2	FAUNA	7/16/2011	0.02 ± 0.02	0.01	0.085 ± 0.085	0.043	U	51.745666	-176.507055
	IRLO-AS-AST2-3	FAUNA	7/16/2011	0.007 ± 0.012	0.006	0.035 ± 0.061	0.03	U	51.745666	-176.507055
	IRLO-AS-AST3-1	FAUNA	7/14/2011	0.01 ± 0.02	0.007	0.045 ± 0.09	0.031	U	51.688333	-176.63375
	IRLO-AS-AST3-2	FAUNA	7/14/2011	0.003 ± 0.014	0.01	0.013 ± 0.059	0.042	U	51.688333	-176.63375
	IRLO-AS-AST3-3	FAUNA	7/14/2011	0.03 ± 0.02	0.004	0.137 ± 0.091	0.018		51.688333	-176.63375
Pacific Cod - whole	PCOD-AS-AS2M-1	FAUNA	7/15/2011	0.001 ± 0.002	0.0009	0.005 ± 0.01	0.005	U	51.737472	-176.48025
Rockfish - whole	ROCK-AS-AST1-1	FAUNA	7/15/2011	0.01 ± 0.02	0.007	0.036 ± 0.072	0.025	U	51.737472	-176.48025
	ROCK-AS-AST1-2	FAUNA	7/15/2011	-0.002 ± 0.002	0.01	-0.007 ± 0.007	0.037	U	51.737472	-176.48025
	ROCK-AS-AST1-3	FAUNA	7/15/2011	0.008 ± 0.008	0.003	0.034 ± 0.034	0.013	U	51.737472	-176.48025
	ROCK-AS-AST2-1	FAUNA	7/16/2011	0.005 ± 0.01	0.009	0.019 ± 0.038	0.035	U	51.745666	-176.507055
	ROCK-AS-AST2-2	FAUNA	7/16/2011	0.003 ± 0.008	0.008	0.011 ± 0.03	0.03	U	51.745666	-176.507055
	ROCK-AS-AST2-3	FAUNA	7/16/2011	0.002 ± 0.004	0.005	0.008 ± 0.015	0.019	U	51.745666	-176.507055
	ROCK-AS-AST3-1	FAUNA	7/14/2011	0.02 ± 0.02	0.01	0.082 ± 0.082	0.041	U	51.688333	-176.63375
	ROCK-AS-AST3-2	FAUNA	7/14/2011	0.02 ± 0.02	0.008	0.085 ± 0.085	0.034	U	51.688333	-176.63375
	ROCK-AS-AST3-3	FAUNA	7/14/2011	-0.001 ± 0.002	0.004	-0.004 ± 0.009	0.017	U	51.688333	-176.63375
	ROCK-AS-DUP	FAUNA	7/14/2011	-0.0008 ± 0.0016	0.005	-0.003 ± 0.006	0.02	U	51.688333	-176.63375
Sea Urchin - whole	URCH-AS-AST1-1	FAUNA	7/15/2011	0.1 ± 0.04	0.009	0.38 ± 0.152	0.034		51.737472	-176.48025
	URCH-AS-AST2-1	FAUNA	7/16/2011	0.12 ± 0.02	0.004	0.484 ± 0.081	0.016		51.745666	-176.507055
	URCH-AS-AST3-1	FAUNA	7/14/2011	0.07 ± 0.02	0.003	0.261 ± 0.075	0.011		51.688333	-176.63375

Qualifier definitions:
U - Analytical result below detection limit
J - Estimated

Appendix I

Activity Concentration of Plutonium Isotopes

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Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
^{239}Plutonium (pCi/kg)										
Amchitka Site (AMC01)										
Dolly Varden - whole	DOLL-AI-XXX-1	FAUNA	6/24/2011	0.01	0.01	0.039	0.039	U	51.468283	179.108052
Goose Egg - no shell	GOOS-AI-XXX-1	FAUNA	6/24/2011	0.07	0.07	0.186	0.186	U	51.491305	179.0595
Glaucous-winged Gull Egg - no shell	GWGU-AI-XXX-1	FAUNA	6/24/2011	0.03	0.03	0.104	0.104	U	51.456388	179.167
Amchitka Site (Long Shot) (AMC02)										
Chiton	CHIT-LS-LT1-1	FAUNA	7/4/2011	0.038 ± 0.002	0.06	0.188 ± 0.01	0.298	J	51.457555	179.195138
	CHIT-LS-LT2-1	FAUNA	7/3/2011	0.031 ± 0.002	0.06	0.145 ± 0.009	0.281	J	51.44925	179.205583
	CHIT-LS-LT3-1	FAUNA	7/3/2011	0.05	0.05	0.238	0.238	U	51.43	179.22667
Dragon Kelp	EUAL-LS-DUP	VEG	7/3/2011	0.0455 ± 0.001	0.01	0.273 ± 0.006	0.06		51.44925	179.205583
	EUAL-LS-LT1-1	VEG	7/4/2011	0.064 ± 0.002	0.01	0.598 ± 0.019	0.093		51.457555	179.195138
	EUAL-LS-LT1-2	VEG	7/4/2011	0.0028 ± 0.0004	0.01	0.017 ± 0.002	0.062	J	51.457555	179.195138
	EUAL-LS-LT1-3	VEG	7/4/2011	0.0137 ± 0.001	0.01	0.083 ± 0.006	0.06	J	51.457555	179.195138
	EUAL-LS-LT2-1	VEG	7/3/2011	0.041 ± 0.002	0.01	0.248 ± 0.012	0.06		51.44925	179.205583
	EUAL-LS-LT2-2	VEG	7/3/2011	0.0206 ± 0.0006	0.01	0.15 ± 0.004	0.073	J	51.44925	179.205583
	EUAL-LS-LT2-3	VEG	7/3/2011	0.0346 ± 0.0006	0.01	0.25 ± 0.004	0.072		51.44925	179.205583
	EUAL-LS-LT3-1	VEG	7/2/2011	0.0137 ± 0.001	0.01	0.087 ± 0.006	0.064	J	51.43	179.22667
	EUAL-LS-LT3-2	VEG	7/2/2011	0.128 ± 0.002	0.01	0.911 ± 0.014	0.071		51.43	179.22667
	EUAL-LS-LT3-3	VEG	7/2/2011	0.068 ± 0.002	0.01	0.574 ± 0.017	0.084		51.43	179.22667
Rockweed	FUCU-LS-DUP	VEG	6/22/2011	0.0031 ± 0.0004	0.01	0.017 ± 0.002	0.055	J	51.447472	179.190888
	FUCU-LS-LT1-1	VEG	6/22/2011	0.007 ± 0.0004	0.01	0.038 ± 0.002	0.054	J	51.447527	179.189361
	FUCU-LS-LT1-2	VEG	6/22/2011	0.0056 ± 0.0006	0.01	0.034 ± 0.004	0.061	J	51.447527	179.189361
	FUCU-LS-LT1-3	VEG	6/22/2011	0.0054 ± 0.0004	0.01	0.036 ± 0.003	0.066	J	51.448777	179.189305
	FUCU-LS-LT2-1	VEG	6/22/2011	0.0022 ± 0.0002	0.004	0.017 ± 0.002	0.032	J	51.447222	179.199361
	FUCU-LS-LT2-2	VEG	6/22/2011	0.0115 ± 0.0004	0.004	0.083 ± 0.003	0.029	J	51.44625	179.196972
	FUCU-LS-LT2-3	VEG	6/22/2011	0.009 ± 0.0004	0.004	0.055 ± 0.002	0.024	J	51.446722	179.191888
	FUCU-LS-LT3-1	VEG	7/2/2011	0.0085 ± 0.0008	0.01	0.041 ± 0.004	0.048	J	51.433611	179.219305
	FUCU-LS-LT3-2	VEG	7/2/2011	0.0043 ± 0.0006	0.01	0.02 ± 0.003	0.046	J	51.430166	179.218694
	FUCU-LS-LT3-3	VEG	7/2/2011	0.0066 ± 0.0004	0.01	0.024 ± 0.001	0.037	J	51.430166	179.218694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-LS-DUP	FAUNA	7/12/2011	0.05	0.05	0.243	0.243	U	51.434527	179.234416
	GREN-LS-LT1-1	FAUNA	7/4/2011	0.05	0.05	0.236	0.236	U	51.457555	179.195138
	GREN-LS-LT1-2	FAUNA	7/4/2011	0.08	0.08	0.379	0.379	U	51.457555	179.195138
	GREN-LS-LT1-3	FAUNA	7/5/2011	0.07	0.07	0.328	0.328	U	51.457555	179.195138
	GREN-LS-LT2-1	FAUNA	7/3/2011	0.05	0.05	0.242	0.242	U	51.432194	179.230277
	GREN-LS-LT2-2	FAUNA	7/3/2011	0.05	0.05	0.231	0.231	U	51.432194	179.230277
	GREN-LS-LT2-3	FAUNA	7/3/2011	0.05	0.05	0.238	0.238	U	51.432194	179.230277
	GREN-LS-LT3-1	FAUNA	7/3/2011	0.04	0.04	0.178	0.178	U	51.43	179.22667
	GREN-LS-LT3-2	FAUNA	7/12/2011	0.05	0.05	0.245	0.245	U	51.434527	179.234416
	GREN-LS-LT3-3	FAUNA	7/12/2011	0.06	0.06	0.29	0.29	U	51.434527	179.234416
Halibut - whole	HALI-LS-L2M-1	FAUNA	7/13/2011	0.01	0.01	0.038	0.038	U	51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-LS-LT1-1	FAUNA	7/5/2011	0.2	0.2	0.857	0.857	U	51.457555	179.195138
	HMUS-LS-LT2-1	FAUNA	7/4/2011	0.1	0.1	0.409	0.409	U	51.44925	179.205583
	HMUS-LS-LT3-1	FAUNA	7/3/2011	2	2	4.194	4.194	U	51.44925	179.205583
Irish Lord - whole	IRLO-LS-LT1-1	FAUNA	7/4/2011	0.07	0.07	0.33	0.33	U	51.457555	179.195138
	IRLO-LS-LT1-2	FAUNA	7/4/2011	0.08	0.08	0.378	0.378	U	51.457555	179.195138
	IRLO-LS-LT1-3	FAUNA	7/5/2011	0.04	0.04	0.212	0.212	U	51.457555	179.195138
	IRLO-LS-LT2-1	FAUNA	7/3/2011	0.06	0.06	0.26	0.26	U	51.432194	179.230277
	IRLO-LS-LT2-2	FAUNA	7/3/2011	0.07	0.07	0.29	0.29	U	51.432194	179.230277
	IRLO-LS-LT2-3	FAUNA	7/3/2011	0.07	0.07	0.31	0.31	U	51.432194	179.230277
	IRLO-LS-LT3-1	FAUNA	7/2/2011	0.02	0.02	0.089	0.089	U	51.43	179.22667
	IRLO-LS-LT3-2	FAUNA	7/12/2011	0.04	0.04	0.19	0.19	U	51.434944	179.2315
	IRLO-LS-LT3-3	FAUNA	7/12/2011	0.03	0.03	0.166	0.166	U	51.434944	179.2315
Octopus	OCTP-LS-L2M-1	FAUNA	7/3/2011	0.005	0.005	0.036	0.036	U	51.44925	179.205583
Pacific Cod - whole	PCOD-LS-L2M-1	FAUNA	7/4/2011	0.01	0.01	0.05	0.05	U	51.451805	179.196972
Rockfish - whole	ROCK-LS-DUP	FAUNA	7/12/2011	0.03	0.03	0.117	0.117	U	51.434944	179.2315
	ROCK-LS-DUP2	FAUNA	7/12/2011	0.03	0.03	0.128	0.128	U	51.465472	179.206722
	ROCK-LS-LT1-1	FAUNA	7/4/2011	0.06	0.06	0.279	0.279	U	51.457555	179.195138
	ROCK-LS-LT1-2	FAUNA	7/12/2011	0.04	0.04	0.165	0.165	U	51.465472	179.206722
	ROCK-LS-LT1-3	FAUNA	7/12/2011	0.03	0.03	0.124	0.124	U	51.465472	179.206722
	ROCK-LS-LT2-1	FAUNA	7/4/2011	0.03	0.03	0.12	0.12	U	51.44925	179.205583
	ROCK-LS-LT2-2	FAUNA	7/12/2011	0.04	0.04	0.158	0.158	U	51.44625	179.223416
	ROCK-LS-LT3-1	FAUNA	7/12/2011	0.03	0.03	0.132	0.132	U	51.434944	179.2315
	ROCK-LS-LT3-2	FAUNA	7/12/2011	0.03	0.03	0.127	0.127	U	51.434944	179.2315
	ROCK-LS-LT3-3	FAUNA	7/3/2011	0.03	0.03	0.104	0.104	U	51.43	179.22667

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-LT1-2	VEG	6/22/2011	0.05	0.05	0.152	0.152	U	51.447361	179.189111
Sea Urchin - whole	URCH-LS-LT1-1	FAUNA	7/4/2011	0.05	0.05	0.195	0.195	U	51.457555	179.195138
	URCH-LS-LT2-1	FAUNA	7/3/2011	0.041 ± 0.006	0.05	0.158 ± 0.023	0.192	J	51.44925	179.205583
	URCH-LS-LT3-1	FAUNA	7/2/2011	0.05	0.05	0.195	0.195	U	51.43	179.22667
Amchitka Site (Milrow) (AMC03)										
Chiton	CHIT-ML-MT1-1	FAUNA	7/9/2011	0.06	0.06	0.226	0.226	U	51.408472	179.139166
	CHIT-ML-MT2-1	FAUNA	7/10/2011	0.06	0.06	0.279	0.279	U	51.389416	179.173138
	CHIT-ML-MT3-1	FAUNA	7/10/2011	0.06	0.06	0.272	0.272	U	51.387805	179.184
Dragon Kelp	EUAL-ML-DUP	VEG	7/9/2011	0.063 ± 0.002	0.01	0.475 ± 0.015	0.075		51.408472	179.139166
	EUAL-ML-MT1-1	VEG	7/9/2011	0.089 ± 0.002	0.01	0.711 ± 0.016	0.08		51.408472	179.139166
	EUAL-ML-MT1-2	VEG	7/9/2011	0.077 ± 0.002	0.01	0.573 ± 0.015	0.074		51.408472	179.139166
	EUAL-ML-MT1-3	VEG	7/9/2011	0.094 ± 0.002	0.01	0.791 ± 0.017	0.084		51.408472	179.139166
	EUAL-ML-MT2-1	VEG	7/10/2011	0.116 ± 0.002	0.01	0.865 ± 0.015	0.075		51.389416	179.173138
	EUAL-ML-MT2-2	VEG	7/10/2011	0.1 ± 0.002	0.01	0.709 ± 0.014	0.071		51.389416	179.173138
	EUAL-ML-MT2-3	VEG	7/10/2011	0.025 ± 0.002	0.01	0.188 ± 0.015	0.075	J	51.389416	179.173138
	EUAL-ML-MT3-1	VEG	7/10/2011	0.156 ± 0.002	0.01	1.097 ± 0.014	0.07		51.387805	179.184
	EUAL-ML-MT3-2	VEG	7/10/2011	0.0351 ± 0.0008	0.01	0.256 ± 0.006	0.073		51.387805	179.184
	EUAL-ML-MT3-3	VEG	7/10/2011	0.136 ± 0.002	0.01	0.938 ± 0.014	0.069		51.387805	179.184
Rockweed	FUCU-ML-DUP	VEG	6/20/2011	0.0057 ± 0.0004	0.01	0.025 ± 0.002	0.043	J	51.412449	179.160843
	FUCU-ML-MT1-1	VEG	6/20/2011	0.0103 ± 0.0006	0.01	0.043 ± 0.002	0.042	J	51.412449	179.160843
	FUCU-ML-MT1-2	VEG	6/21/2011	0.0123 ± 0.0004	0.01	0.075 ± 0.002	0.061	J	51.417083	179.134083
	FUCU-ML-MT1-3	VEG	7/9/2011	0.0023 ± 0.0008	0.01	0.011 ± 0.004	0.046	J	51.417083	179.134083
	FUCU-ML-MT2-1	VEG	6/20/2011	0.0083 ± 0.0006	0.01	0.043 ± 0.003	0.052	J	51.403305	179.167166
	FUCU-ML-MT2-2	VEG	6/21/2011	0.0082 ± 0.0006	0.01	0.058 ± 0.004	0.07	J	51.405694	179.161361
	FUCU-ML-MT2-3	VEG	6/21/2011	0.0064 ± 0.0006	0.01	0.044 ± 0.004	0.069	J	51.405694	179.161361
	FUCU-ML-MT3-1	VEG	7/10/2011	0.0039 ± 0.0008	0.01	0.019 ± 0.004	0.049	J	51.389416	179.173138
	FUCU-ML-MT3-2	VEG	7/10/2011	0.0049 ± 0.0004	0.01	0.024 ± 0.002	0.048	J	51.389416	179.173138
	FUCU-ML-MT3-3	VEG	7/10/2011	0.0111 ± 0.0004	0.01	0.056 ± 0.002	0.05	J	51.389416	179.173138

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-ML-DUP	FAUNA	7/10/2011	0.06	0.06	0.291	0.291	U	51.387805	179.184
	GREN-ML-MT1-1	FAUNA	7/9/2011	0.04	0.04	0.174	0.174	U	51.408472	179.139166
	GREN-ML-MT1-2	FAUNA	7/9/2011	0.05	0.05	0.232	0.232	U	51.408472	179.139166
	GREN-ML-MT1-3	FAUNA	7/9/2011	0.04	0.04	0.193	0.193	U	51.408472	179.139166
	GREN-ML-MT2-1	FAUNA	7/11/2011	0.06	0.06	0.28	0.28	U	51.396944	179.1435
	GREN-ML-MT2-2	FAUNA	7/11/2011	0.06	0.06	0.281	0.281	U	51.396944	179.1435
	GREN-ML-MT2-3	FAUNA	7/11/2011	0.05	0.05	0.239	0.239	U	51.396944	179.1435
	GREN-ML-MT3-1	FAUNA	7/10/2011	0.05	0.05	0.242	0.242	U	51.387805	179.184
	GREN-ML-MT3-2	FAUNA	7/10/2011	0.06	0.06	0.289	0.289	U	51.387805	179.184
	GREN-ML-MT3-3	FAUNA	7/10/2011	0.06	0.06	0.284	0.284	U	51.387805	179.184
Halibut - whole	HALI-ML-M2M-1	FAUNA	7/11/2011	0.01	0.01	0.035	0.035	U	51.365055	179.111472
Horse Mussel - soft tissue only	HMUS-ML-MT1-1	FAUNA	7/9/2011	0.114 ± 0.012	0.19	0.518 ± 0.055	0.864	J	51.408472	179.139166
	HMUS-ML-MT2-1	FAUNA	7/11/2011	0.2	0.2	0.899	0.899	U	51.389416	179.173138
	HMUS-ML-MT3-1	FAUNA	7/10/2011	0.2	0.2	0.918	0.918	U	51.387805	179.184
Irish Lord - whole	IRLO-ML-MT1-1	FAUNA	7/9/2011	0.04	0.04	0.171	0.171	U	51.408472	179.139166
	IRLO-ML-MT1-2	FAUNA	7/9/2011	0.04	0.04	0.19	0.19	U	51.408472	179.139166
	IRLO-ML-MT1-3	FAUNA	7/9/2011	0.07	0.07	0.328	0.328	U	51.408472	179.139166
	IRLO-ML-MT2-1	FAUNA	7/10/2011	0.04	0.04	0.172	0.172	U	51.389416	179.173138
	IRLO-ML-MT2-2	FAUNA	7/11/2011	0.07	0.07	0.302	0.302	U	51.396944	179.1435
	IRLO-ML-MT2-3	FAUNA	7/11/2011	0.08	0.08	0.379	0.379	U	51.396944	179.1435
	IRLO-ML-MT3-1	FAUNA	7/10/2011	0.04	0.04	0.225	0.225	U	51.387805	179.184
	IRLO-ML-MT3-2	FAUNA	7/10/2011	0.04	0.04	0.193	0.193	U	51.387805	179.184
	IRLO-ML-MT3-3	FAUNA	7/10/2011	0.04	0.04	0.224	0.224	U	51.387805	179.184
Octopus	OCTP-ML-M2M-1	FAUNA	7/10/2011	0.027 ± 0.008	0.05	0.127 ± 0.038	0.236	J	51.389416	179.173138
Pacific Cod - whole	PCOD-ML-M2M-1	FAUNA	7/10/2011	0.01	0.01	0.053	0.053	U	51.408472	179.139166
Rockfish - whole	ROCK-ML-DUP	FAUNA	7/9/2011	0.04	0.04	0.177	0.177	U	51.408472	179.139166
	ROCK-ML-MT1-1	FAUNA	7/9/2011	0.03	0.03	0.132	0.132	U	51.408472	179.139166
	ROCK-ML-MT1-2	FAUNA	7/9/2011	0.04	0.04	0.176	0.176	U	51.408472	179.139166
	ROCK-ML-MT1-3	FAUNA	7/9/2011	0.03	0.03	0.127	0.127	U	51.408472	179.139166
	ROCK-ML-MT2-1	FAUNA	7/11/2011	0.04	0.04	0.15	0.15	U	51.365055	179.111472
	ROCK-ML-MT2-2	FAUNA	7/11/2011	0.04	0.04	0.162	0.162	U	51.365055	179.111472
	ROCK-ML-MT2-3	FAUNA	7/11/2011	0.04	0.04	0.18	0.18	U	51.365055	179.111472
	ROCK-ML-MT3-1	FAUNA	7/10/2011	0.04	0.04	0.189	0.189	U	51.387805	179.184
	ROCK-ML-MT3-2	FAUNA	7/10/2011	0.03	0.03	0.108	0.108	U	51.387805	179.184
	ROCK-ML-MT3-3	FAUNA	7/10/2011	0.02	0.02	0.047	0.047	U	51.387805	179.184

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-ML-1	VEG	6/21/2011	0.06	0.06	0.215	0.215	U	51.402583	179.183972
Sea Urchin - whole	URCH-ML-MT1-1	FAUNA	7/9/2011	0.04	0.04	0.148	0.148	U	51.408472	179.139166
	URCH-ML-MT2-1	FAUNA	7/10/2011	0.05	0.05	0.187	0.187	U	51.389416	179.173138
	URCH-ML-MT3-1	FAUNA	7/10/2011	0.06	0.06	0.238	0.238	U	51.387805	179.184
Amchitka Site (Cannikin) (AMC05)										
Chiton	CHIT-CN-CT1-1	FAUNA	7/8/2011	0.06	0.06	0.281	0.281	U	51.482972	179.123833
	CHIT-CN-CT2-1	FAUNA	7/7/2011	0.05 ± 0.02	0.06	0.237 ± 0.095	0.284	J	51.472611	179.151111
	CHIT-CN-CT3-1	FAUNA	7/5/2011	0.07	0.07	0.344	0.344	U	51.471416	179.172861
Dragon Kelp	EUAL-CN-CT1-1	VEG	7/8/2011	0.074 ± 0.002	0.01	0.548 ± 0.015	0.074		51.482972	179.123833
	EUAL-CN-CT1-2	VEG	7/8/2011	0.0113 ± 0.0006	0.01	0.074 ± 0.004	0.065	J	51.482972	179.123833
	EUAL-CN-CT1-3	VEG	7/8/2011	0.0301 ± 0.0006	0.01	0.184 ± 0.004	0.061		51.482972	179.123833
	EUAL-CN-CT2-1	VEG	7/6/2011	0.0253 ± 0.001	0.01	0.161 ± 0.006	0.064	J	51.472611	179.151111
	EUAL-CN-CT2-2	VEG	7/6/2011	0.029 ± 0.002	0.01	0.182 ± 0.013	0.063	J	51.472611	179.151111
	EUAL-CN-CT2-3	VEG	7/7/2011	0.061 ± 0.002	0.01	0.442 ± 0.014	0.072		51.472611	179.151111
	EUAL-CN-CT3-1	VEG	7/5/2011	0.01	0.01	0.07	0.07	U	51.471416	179.172861
	EUAL-CN-CT3-2	VEG	7/5/2011	0.0153 ± 0.0006	0.01	0.11 ± 0.004	0.072	J	51.471416	179.172861
	EUAL-CN-CT3-3	VEG	7/5/2011	0.0037 ± 0.0004	0.01	0.024 ± 0.003	0.065	J	51.471416	179.172861
	EUAL-CN-DUP	VEG	7/6/2011	0.0326 ± 0.0008	0.01	0.217 ± 0.005	0.066		51.471416	179.172861
Rockweed	FUCU-CN-CT1-1	VEG	6/23/2011	0.01	0.01	0.058	0.058	U	51.481888	179.118138
	FUCU-CN-CT1-2	VEG	6/23/2011	0.01	0.01	0.063	0.063	U	51.481888	179.118138
	FUCU-CN-CT1-3	VEG	6/23/2011	0.0048 ± 0.0006	0.01	0.028 ± 0.004	0.059	J	51.481888	179.118138
	FUCU-CN-CT2-1	VEG	7/8/2011	0.0105 ± 0.0006	0.01	0.043 ± 0.002	0.041	J	51.476638	179.135277
	FUCU-CN-CT2-2	VEG	7/8/2011	0.0083 ± 0.0004	0.01	0.037 ± 0.002	0.044	J	51.476638	179.135277
	FUCU-CN-CT2-3	VEG	7/12/2011	0.0059 ± 0.0008	0.01	0.031 ± 0.004	0.053	J	51.467583	179.153583
	FUCU-CN-CT3-1	VEG	7/6/2011	0.0108 ± 0.0008	0.01	0.058 ± 0.004	0.054	J	51.465027	179.173166
	FUCU-CN-CT3-2	VEG	7/6/2011	0.0041 ± 0.0004	0.01	0.024 ± 0.002	0.059	J	51.465472	179.170583
	FUCU-CN-CT3-3	VEG	7/6/2011	0.0112 ± 0.0008	0.01	0.071 ± 0.005	0.063	J	51.464638	179.159305
	FUCU-CN-DUP	VEG	6/23/2011	0.01	0.01	0.065	0.065	U	51.481888	179.118138

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-CN-CT1-1	FAUNA	7/8/2011	0.05	0.05	0.241	0.241	U	51.482972	179.123833
	GREN-CN-CT1-2	FAUNA	7/8/2011	0.06	0.06	0.285	0.285	U	51.482972	179.123833
	GREN-CN-CT1-3	FAUNA	7/8/2011	0.05	0.05	0.228	0.228	U	51.482972	179.123833
	GREN-CN-CT2-1	FAUNA	7/7/2011	0.04	0.04	0.195	0.195	U	51.472611	179.151111
	GREN-CN-CT2-2	FAUNA	7/7/2011	0.05	0.05	0.229	0.229	U	51.472611	179.151111
	GREN-CN-CT2-3	FAUNA	7/7/2011	0.04	0.04	0.185	0.185	U	51.472611	179.151111
	GREN-CN-CT3-1	FAUNA	7/5/2011	0.02 ± 0.004	0.05	0.091 ± 0.018	0.228	J	51.471416	179.172861
	GREN-CN-CT3-2	FAUNA	7/5/2011	0.018 ± 0.004	0.05	0.078 ± 0.017	0.218	J	51.471416	179.172861
	GREN-CN-CT3-3	FAUNA	7/5/2011	0.04	0.04	0.184	0.184	U	51.471416	179.172861
	GREN-CN-DUP	FAUNA	7/8/2011	0.06	0.06	0.289	0.289	U	51.482972	179.123833
Halibut - whole	HALI-CN-C2M-1	FAUNA	7/13/2011	0.005	0.005	0.019	0.019	U	51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-CN-CT1-1	FAUNA	7/8/2011	0.2	0.2	0.822	0.822	U	51.482972	179.123833
	HMUS-CN-CT2-1	FAUNA	7/7/2011	0.253 ± 0.008	0.19	1.146 ± 0.036	0.861	J	51.472611	179.151111
	HMUS-CN-CT3-1	FAUNA	7/5/2011	0.2	0.2	0.82	0.82	U	51.471416	179.172861
Irish Lord - whole	IRLO-CN-CT1-1	FAUNA	7/8/2011	0.07	0.07	0.315	0.315	U	51.482972	179.123833
	IRLO-CN-CT1-2	FAUNA	7/8/2011	0.04	0.04	0.2	0.2	U	51.482972	179.123833
	IRLO-CN-CT1-3	FAUNA	7/8/2011	0.07	0.07	0.329	0.329	U	51.482972	179.123833
	IRLO-CN-CT2-1	FAUNA	7/7/2011	0.04	0.04	0.189	0.189	U	51.472611	179.151111
	IRLO-CN-CT2-2	FAUNA	7/7/2011	0.05	0.05	0.228	0.228	U	51.472611	179.151111
	IRLO-CN-CT2-3	FAUNA	7/7/2011	0.04	0.04	0.197	0.197	U	51.472611	179.151111
	IRLO-CN-CT3-1	FAUNA	7/5/2011	0.07	0.07	0.361	0.361	U	51.471416	179.172861
	IRLO-CN-CT3-2	FAUNA	7/5/2011	0.04	0.04	0.194	0.194	U	51.471416	179.172861
	IRLO-CN-CT3-3	FAUNA	7/5/2011	0.04	0.04	0.192	0.192	U	51.471416	179.172861
Octopus	OCTP-CN-C2M-1	FAUNA	7/8/2011	0.031 ± 0.004	0.02	0.152 ± 0.02	0.098	J	51.482972	179.123833
Pacific Cod - whole	PCOD-CN-C2M-1	FAUNA	7/6/2011	0.01	0.01	0.046	0.046	U	51.483527	179.187583
Rockfish - whole	ROCK-CN-CT1-1	FAUNA	7/8/2011	0.04	0.04	0.158	0.158	U	51.482972	179.123833
	ROCK-CN-CT1-2	FAUNA	7/8/2011	0.03	0.03	0.116	0.116	U	51.482972	179.123833
	ROCK-CN-CT1-3	FAUNA	7/8/2011	0.03	0.03	0.121	0.121	U	51.482972	179.123833
	ROCK-CN-CT2-1	FAUNA	7/6/2011	0.03	0.03	0.106	0.106	U	51.472611	179.151111
	ROCK-CN-CT2-2	FAUNA	7/6/2011	0.03	0.03	0.11	0.11	U	51.472611	179.151111
	ROCK-CN-CT2-3	FAUNA	7/6/2011	0.03	0.03	0.123	0.123	U	51.472611	179.151111
	ROCK-CN-CT3-1	FAUNA	7/6/2011	0.03	0.03	0.128	0.128	U	51.471416	179.172861
	ROCK-CN-CT3-2	FAUNA	7/6/2011	0.03	0.03	0.115	0.115	U	51.471416	179.172861
	ROCK-CN-CT3-3	FAUNA	7/6/2011	0.04	0.04	0.167	0.167	U	51.471416	179.172861
	ROCK-CN-DUP	FAUNA	7/6/2011	0.04	0.04	0.161	0.161	U	51.471416	179.172861

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-CT1-1	VEG	6/23/2011	0.064 ± 0.004	0.07	0.101 ± 0.006	0.111	J	51.480583	179.109472
Sea Urchin - whole	URCH-CN-CT1-1	FAUNA	7/8/2011	0.09 ± 0.004	0.04	0.361 ± 0.016	0.16	J	51.482972	179.123833
	URCH-CN-CT2-1	FAUNA	7/7/2011	0.06	0.06	0.206	0.206	U	51.472611	179.151111
	URCH-CN-CT3-1	FAUNA	7/5/2011	0.033 ± 0.004	0.04	0.126 ± 0.015	0.153	J	51.471416	179.172861
Amchitka Site (Adak Island) (AMC13)										
Dolly Varden - whole	DOLL-AD-XXX-1	FAUNA	6/28/2011	0.01	0.01	0.041	0.041	U	51.8375	-176.672555
Reindeer Lichen	STRL-AD-XXX-1	VEG	6/28/2011	0.308 ± 0.008	0.05	0.603 ± 0.016	0.098		51.837527	-176.670694
	STRL-AD-XXX-2	VEG	6/29/2011	0.1 ± 0.004	0.04	0.247 ± 0.01	0.099	J	51.872833	-176.707444
	STRL-AD-XXX-3	VEG	6/29/2011	0.237 ± 0.008	0.05	0.377 ± 0.013	0.079		51.900805	-176.688527
Amchitka Site (Adak Island North) (AMC14)										
Chiton	CHIT-AN-ANT1-1	FAUNA	7/20/2011	0.03	0.03	0.146	0.146	U	51.838722	-176.582805
	CHIT-AN-ANT2-1	FAUNA	7/18/2011	0.04	0.04	0.2	0.2	U	51.848361	-176.506277
	CHIT-AN-ANT3-1	FAUNA	7/17/2011	0.04	0.04	0.203	0.203	U	51.853722	-176.470694
Dragon Kelp	EUAL-AN-ANT1-1	VEG	7/19/2011	0.051 ± 0.002	0.01	0.428 ± 0.017	0.084		51.835694	-176.542138
	EUAL-AN-ANT1-2	VEG	7/19/2011	0.0146 ± 0.0006	0.01	0.1 ± 0.004	0.068	J	51.835694	-176.542138
	EUAL-AN-ANT1-3	VEG	7/19/2011	0.0362 ± 0.0008	0.01	0.28 ± 0.006	0.077		51.835694	-176.542138
	EUAL-AN-ANT2-1	VEG	7/18/2011	0.022 ± 0.002	0.01	0.16 ± 0.015	0.073	J	51.848361	-176.506277
	EUAL-AN-ANT2-2	VEG	7/18/2011	0.035 ± 0.002	0.01	0.223 ± 0.013	0.064		51.848361	-176.506277
	EUAL-AN-ANT2-3	VEG	7/18/2011	0.054 ± 0.002	0.01	0.375 ± 0.014	0.069		51.848361	-176.506277
	EUAL-AN-ANT3-1	VEG	7/17/2011	0.049 ± 0.002	0.01	0.366 ± 0.015	0.075		51.853722	-176.470694
	EUAL-AN-ANT3-2	VEG	7/17/2011	0.0133 ± 0.0006	0.01	0.091 ± 0.004	0.068	J	51.853722	-176.470694
	EUAL-AN-ANT3-3	VEG	7/17/2011	0.0136 ± 0.0008	0.01	0.091 ± 0.005	0.067	J	51.853722	-176.470694
	EUAL-AN-DUP	VEG	7/17/2011	0.0208 ± 0.0008	0.01	0.131 ± 0.005	0.063	J	51.853722	-176.470694
Rockweed	FUCU-AN-ANT1-1	VEG	7/19/2011	0.019 ± 0.0006	0.01	0.097 ± 0.003	0.051	J	51.841444	-176.546083
	FUCU-AN-ANT1-2	VEG	7/20/2011	0.01	0.01	0.065	0.065	U	51.8395	-176.591305
	FUCU-AN-ANT1-3	VEG	7/20/2011	0.0055 ± 0.0008	0.01	0.03 ± 0.004	0.055	J	51.8395	-176.591305
	FUCU-AN-ANT2-1	VEG	7/18/2011	0.0061 ± 0.001	0.01	0.039 ± 0.006	0.063	J	51.837666	-176.517527
	FUCU-AN-ANT2-2	VEG	7/18/2011	0.01	0.01	0.053	0.053	U	51.841444	-176.546083
	FUCU-AN-ANT2-3	VEG	7/18/2011	0.0036 ± 0.0004	0.01	0.015 ± 0.002	0.042	J	51.8395	-176.591305
	FUCU-AN-ANT3-1	VEG	7/18/2011	0.004 ± 0.0008	0.01	0.023 ± 0.005	0.057	J	51.839944	-176.515916
	FUCU-AN-ANT3-2	VEG	7/18/2011	0.0063 ± 0.0004	0.01	0.031 ± 0.002	0.049	J	51.828972	-176.448305
	FUCU-AN-ANT3-3	VEG	7/18/2011	0.0068 ± 0.0004	0.01	0.034 ± 0.002	0.05	J	51.830833	-176.456361
	FUCU-AN-DUP	VEG	7/18/2011	0.0048 ± 0.0004	0.01	0.022 ± 0.002	0.047	J	51.828972	-176.448305

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-AN-ANT1-1	FAUNA	7/19/2011	0.06	0.06	0.266	0.266	U	51.835694	-176.542138
	GREN-AN-ANT1-2	FAUNA	7/19/2011	0.06	0.06	0.251	0.251	U	51.835694	-176.542138
	GREN-AN-ANT1-3	FAUNA	7/19/2011	0.06	0.06	0.219	0.219	U	51.835694	-176.542138
	GREN-AN-ANT2-1	FAUNA	7/18/2011	0.05	0.05	0.231	0.231	U	51.848361	-176.506277
	GREN-AN-ANT2-2	FAUNA	7/18/2011	0.05	0.05	0.232	0.232	U	51.848361	-176.506277
	GREN-AN-ANT2-3	FAUNA	7/18/2011	0.06	0.06	0.285	0.285	U	51.848361	-176.506277
	GREN-AN-ANT3-1	FAUNA	7/17/2011	0.06	0.06	0.274	0.274	U	51.853722	-176.470694
	GREN-AN-ANT3-2	FAUNA	7/17/2011	0.05	0.05	0.232	0.232	U	51.853722	-176.470694
	GREN-AN-ANT3-3	FAUNA	7/17/2011	0.06	0.06	0.279	0.279	U	51.853722	-176.470694
	GREN-AN-DUP	FAUNA	7/17/2011	0.06	0.06	0.286	0.286	U	51.853722	-176.470694
Halibut - whole	HALI-AN-AN2M-1	FAUNA	7/17/2011	0.004	0.004	0.013	0.013	U	51.853722	-176.470694
	HALI-AN-DUP	FAUNA	7/17/2011	0.01	0.01	0.033	0.033	U	51.853722	-176.470694
Horse Mussel - soft tissue only	HMUS-AN-ANT1-1	FAUNA	7/20/2011	0.073 ± 0.01	0.15	0.399 ± 0.055	0.82	J	51.838722	-176.582805
	HMUS-AN-ANT2-1	FAUNA	7/18/2011	0.2	0.2	0.918	0.918	U	51.848361	-176.506277
	HMUS-AN-ANT3-1	FAUNA	7/18/2011	0.1	0.1	0.446	0.446	U	51.853722	-176.470694
Irish Lord - whole	IRLO-AN-ANT1-1	FAUNA	7/19/2011	0.05	0.05	0.235	0.235	U	51.835694	-176.542138
	IRLO-AN-ANT1-2	FAUNA	7/19/2011	0.06	0.06	0.266	0.266	U	51.835694	-176.542138
	IRLO-AN-ANT1-3	FAUNA	7/19/2011	0.03	0.03	0.132	0.132	U	51.835694	-176.542138
	IRLO-AN-ANT2-1	FAUNA	7/19/2011	0.05	0.05	0.237	0.237	U	51.848361	-176.506277
	IRLO-AN-ANT2-2	FAUNA	7/19/2011	0.04	0.04	0.185	0.185	U	51.848361	-176.506277
	IRLO-AN-ANT2-3	FAUNA	7/19/2011	0.03	0.03	0.143	0.143	U	51.848361	-176.506277
	IRLO-AN-ANT3-1	FAUNA	7/17/2011	0.05	0.05	0.24	0.24	U	51.853722	-176.470694
	IRLO-AN-ANT3-2	FAUNA	7/17/2011	0.04	0.04	0.18	0.18	U	51.853722	-176.470694
	IRLO-AN-ANT3-3	FAUNA	7/17/2011	0.04	0.04	0.18	0.18	U	51.853722	-176.470694
Octopus	OCTP-AN-AN2M-1	FAUNA	7/18/2011	0.02 ± 0.002	0.02	0.101 ± 0.01	0.101	J	51.848361	-176.506277
Pacific Cod - whole	PCOD-AN-AN2M-1	FAUNA	7/17/2011	0.01	0.01	0.049	0.049	U	51.853722	-176.470694
Rockfish - whole	ROCK-AN-ANT1-1	FAUNA	7/19/2011	0.02	0.02	0.074	0.074	U	51.835694	-176.542138
	ROCK-AN-ANT2-1	FAUNA	7/18/2011	0.01	0.01	0.037	0.037	U	51.848361	-176.506277
	ROCK-AN-ANT2-2	FAUNA	7/18/2011	0.02	0.02	0.082	0.082	U	51.848361	-176.506277
	ROCK-AN-ANT3-1	FAUNA	7/17/2011	0.03	0.03	0.107	0.107	U	51.853722	-176.470694
	ROCK-AN-ANT3-2	FAUNA	7/17/2011	0.03	0.03	0.116	0.116	U	51.853722	-176.470694
	ROCK-AN-ANT3-3	FAUNA	7/17/2011	0.06	0.06	0.236	0.236	U	51.853722	-176.470694
Sea Urchin - whole	URCH-AN-ANT1-1	FAUNA	7/19/2011	0.04	0.04	0.136	0.136	U	51.835694	-176.542138
	URCH-AN-ANT2-1	FAUNA	7/18/2011	0.042 ± 0.004	0.04	0.153 ± 0.015	0.146	J	51.848361	-176.506277
	URCH-AN-ANT3-1	FAUNA	7/17/2011	0.04	0.04	0.152	0.152	U	51.853722	-176.470694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Amchitka Site (Adak Island South) (AMC15)										
Chiton	CHIT-AS-AST1-1	FAUNA	7/15/2011	0.06	0.06	0.247	0.247	U	51.737472	-176.48025
	CHIT-AS-AST2-1	FAUNA	7/16/2011	0.04	0.04	0.205	0.205	U	51.745666	-176.507055
	CHIT-AS-AST3-1	FAUNA	7/14/2011	0.056 ± 0.008	0.06	0.264 ± 0.038	0.283	J	51.688333	-176.63375
Dragon Kelp	EUAL-AS-AST1-1	VEG	7/15/2011	0.0193 ± 0.0008	0.01	0.127 ± 0.005	0.066	J	51.737472	-176.48025
	EUAL-AS-AST1-2	VEG	7/15/2011	0.0577 ± 0.0008	0.01	0.46 ± 0.006	0.08		51.737472	-176.48025
	EUAL-AS-AST1-3	VEG	7/15/2011	0.1 ± 0.002	0.01	0.96 ± 0.019	0.096		51.737472	-176.48025
	EUAL-AS-AST2-1	VEG	7/16/2011	0.0366 ± 0.0008	0.01	0.26 ± 0.006	0.071		51.745666	-176.507055
	EUAL-AS-AST2-2	VEG	7/16/2011	0.0206 ± 0.001	0.01	0.146 ± 0.007	0.071	J	51.745666	-176.507055
	EUAL-AS-AST2-3	VEG	7/16/2011	0.0189 ± 0.0008	0.01	0.137 ± 0.006	0.073	J	51.745666	-176.507055
	EUAL-AS-AST3-1	VEG	7/14/2011	0.1 ± 0.002	0.01	0.73 ± 0.015	0.073		51.688333	-176.63375
	EUAL-AS-AST3-2	VEG	7/14/2011	0.11 ± 0.002	0.01	1.043 ± 0.019	0.095		51.688333	-176.63375
	EUAL-AS-AST3-3	VEG	7/14/2011	0.104 ± 0.002	0.01	0.917 ± 0.018	0.088		51.688333	-176.63375
	EUAL-AS-DUP	VEG	7/14/2011	0.039 ± 0.002	0.01	0.287 ± 0.015	0.074		51.688333	-176.63375
Rockweed	FUCU-AS-AST1-1	VEG	7/16/2011	0.0072 ± 0.0004	0.01	0.044 ± 0.002	0.062	J	51.733666	-176.470805
	FUCU-AS-AST1-2	VEG	7/16/2011	0.0045 ± 0.0004	0.01	0.025 ± 0.002	0.055	J	51.733666	-176.470805
	FUCU-AS-AST1-3	VEG	7/16/2011	0.011 ± 0.0006	0.01	0.06 ± 0.003	0.054	J	51.733666	-176.470805
	FUCU-AS-AST2-1	VEG	7/16/2011	0.0085 ± 0.0004	0.01	0.041 ± 0.002	0.048	J	51.745666	-176.507055
	FUCU-AS-AST2-2	VEG	7/16/2011	0.0086 ± 0.0004	0.01	0.044 ± 0.002	0.051	J	51.745666	-176.507055
	FUCU-AS-AST2-3	VEG	7/16/2011	0.01	0.01	0.049	0.049	U	51.745666	-176.507055
	FUCU-AS-AST3-1	VEG	7/14/2011	0.0048 ± 0.0004	0.01	0.025 ± 0.002	0.053	J	51.688333	-176.63375
	FUCU-AS-AST3-2	VEG	7/14/2011	0.0094 ± 0.0006	0.01	0.046 ± 0.003	0.049	J	51.688333	-176.63375
	FUCU-AS-AST3-3	VEG	7/14/2011	0.0022 ± 0.0002	0.004	0.012 ± 0.001	0.021	J	51.688333	-176.63375
	FUCU-AS-DUP	VEG	7/16/2011	0.0043 ± 0.0004	0.01	0.022 ± 0.002	0.052	J	51.733666	-176.470805
Greenling - whole	GREN-AS-AST1-1	FAUNA	7/15/2011	0.06	0.06	0.286	0.286	U	51.737472	-176.48025
	GREN-AS-AST1-2	FAUNA	7/15/2011	0.05	0.05	0.236	0.236	U	51.737472	-176.48025
	GREN-AS-AST1-3	FAUNA	7/15/2011	0.05	0.05	0.24	0.24	U	51.737472	-176.48025
	GREN-AS-AST2-1	FAUNA	7/16/2011	0.04	0.04	0.161	0.161	U	51.745666	-176.507055
	GREN-AS-AST2-2	FAUNA	7/16/2011	0.05	0.05	0.229	0.229	U	51.745666	-176.507055
	GREN-AS-AST2-3	FAUNA	7/16/2011	0.05	0.05	0.233	0.233	U	51.745666	-176.507055
	GREN-AS-AST3-1	FAUNA	7/14/2011	0.05	0.05	0.238	0.238	U	51.688333	-176.63375
	GREN-AS-AST3-2	FAUNA	7/14/2011	0.06	0.06	0.282	0.282	U	51.688333	-176.63375
	GREN-AS-AST3-3	FAUNA	7/14/2011	0.07	0.07	0.334	0.334	U	51.688333	-176.63375
	GREN-AS-DUP	FAUNA	7/14/2011	0.05	0.05	0.251	0.251	U	51.688333	-176.63375

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Horse Mussel - soft tissue only	HMUS-AS-AST1-1	FAUNA	7/15/2011	0.2	0.2	1.002	1.002	U	51.737472	-176.48025
	HMUS-AS-AST2-1	FAUNA	7/16/2011	0.2	0.2	1.269	1.269	U	51.745666	-176.507055
	HMUS-AS-AST3-1	FAUNA	7/14/2011	0.2	0.2	1.02	1.02	U	51.688333	-176.63375
Irish Lord - whole	IRLO-AS-AST1-1	FAUNA	7/15/2011	0.07	0.07	0.308	0.308	U	51.737472	-176.48025
	IRLO-AS-AST1-2	FAUNA	7/15/2011	0.06	0.06	0.28	0.28	U	51.737472	-176.48025
	IRLO-AS-AST1-3	FAUNA	7/15/2011	0.06	0.06	0.273	0.273	U	51.737472	-176.48025
	IRLO-AS-AST2-1	FAUNA	7/16/2011	0.06	0.06	0.281	0.281	U	51.745666	-176.507055
	IRLO-AS-AST2-2	FAUNA	7/16/2011	0.06	0.06	0.255	0.255	U	51.745666	-176.507055
	IRLO-AS-AST2-3	FAUNA	7/16/2011	0.05	0.05	0.253	0.253	U	51.745666	-176.507055
	IRLO-AS-AST3-1	FAUNA	7/14/2011	0.04	0.04	0.18	0.18	U	51.688333	-176.63375
	IRLO-AS-AST3-2	FAUNA	7/14/2011	0.04	0.04	0.169	0.169	U	51.688333	-176.63375
	IRLO-AS-AST3-3	FAUNA	7/14/2011	0.03	0.03	0.137	0.137	U	51.688333	-176.63375
Pacific Cod - whole	PCOD-AS-AS2M-1	FAUNA	7/15/2011	0.01	0.01	0.05	0.05	U	51.737472	-176.48025
Rockfish - whole	ROCK-AS-AST1-1	FAUNA	7/15/2011	0.06	0.06	0.216	0.216	U	51.737472	-176.48025
	ROCK-AS-AST1-2	FAUNA	7/15/2011	0.04	0.04	0.15	0.15	U	51.737472	-176.48025
	ROCK-AS-AST1-3	FAUNA	7/15/2011	0.02	0.02	0.086	0.086	U	51.737472	-176.48025
	ROCK-AS-AST2-1	FAUNA	7/16/2011	0.04	0.04	0.153	0.153	U	51.745666	-176.507055
	ROCK-AS-AST2-2	FAUNA	7/16/2011	0.03	0.03	0.111	0.111	U	51.745666	-176.507055
	ROCK-AS-AST2-3	FAUNA	7/16/2011	0.03	0.03	0.116	0.116	U	51.745666	-176.507055
	ROCK-AS-AST3-1	FAUNA	7/14/2011	0.04	0.04	0.164	0.164	U	51.688333	-176.63375
	ROCK-AS-AST3-2	FAUNA	7/14/2011	0.06	0.06	0.254	0.254	U	51.688333	-176.63375
	ROCK-AS-AST3-3	FAUNA	7/14/2011	0.03	0.03	0.13	0.13	U	51.688333	-176.63375
	ROCK-AS-DUP	FAUNA	7/14/2011	0.02	0.02	0.078	0.078	U	51.688333	-176.63375
Sea Urchin - whole	URCH-AS-AST1-1	FAUNA	7/15/2011	0.05	0.05	0.19	0.19	U	51.737472	-176.48025
	URCH-AS-AST2-1	FAUNA	7/16/2011	0.07	0.07	0.283	0.283	U	51.745666	-176.507055
	URCH-AS-AST3-1	FAUNA	7/14/2011	0.06	0.06	0.224	0.224	U	51.688333	-176.63375
^{240}Plutonium (pCi/kg)										
Amchitka Site (AMC01)										
Dolly Varden - whole	DOLL-AI-XXX-1	FAUNA	6/24/2011	0.01	0.01	0.039	0.039	U	51.468283	179.108052
Goose Egg - no shell	GOOS-AI-XXX-1	FAUNA	6/24/2011	0.04	0.04	0.106	0.106	U	51.491305	179.0595
Glaucous-winged Gull Egg - no shell	GWGU-AI-XXX-1	FAUNA	6/24/2011	0.02	0.02	0.069	0.069	U	51.456388	179.167

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Amchitka Site (Long Shot) (AMC02)										
Chiton	CHIT-LS-LT1-1	FAUNA	7/4/2011	0.03	0.03	0.149	0.149	U	51.457555	179.195138
	CHIT-LS-LT2-1	FAUNA	7/3/2011	0.03	0.03	0.141	0.141	U	51.44925	179.205583
	CHIT-LS-LT3-1	FAUNA	7/3/2011	0.03	0.03	0.143	0.143	U	51.43	179.22667
Dragon Kelp	EUAL-LS-DUP	VEG	7/3/2011	0.034 ± 0.002	0.003	0.204 ± 0.012	0.018		51.44925	179.205583
	EUAL-LS-LT1-1	VEG	7/4/2011	0.051 ± 0.004	0.004	0.477 ± 0.037	0.037		51.457555	179.195138
	EUAL-LS-LT1-2	VEG	7/4/2011	0.003	0.003	0.019	0.019	U	51.457555	179.195138
	EUAL-LS-LT1-3	VEG	7/4/2011	0.01 ± 0.002	0.003	0.06 ± 0.012	0.018		51.457555	179.195138
	EUAL-LS-LT2-1	VEG	7/3/2011	0.032 ± 0.002	0.003	0.194 ± 0.012	0.018		51.44925	179.205583
	EUAL-LS-LT2-2	VEG	7/3/2011	0.013 ± 0.002	0.004	0.094 ± 0.015	0.029		51.44925	179.205583
	EUAL-LS-LT2-3	VEG	7/3/2011	0.029 ± 0.002	0.003	0.21 ± 0.014	0.022		51.44925	179.205583
	EUAL-LS-LT3-1	VEG	7/2/2011	0.011 ± 0.002	0.003	0.07 ± 0.013	0.019		51.43	179.22667
	EUAL-LS-LT3-2	VEG	7/2/2011	0.103 ± 0.004	0.004	0.733 ± 0.028	0.028		51.43	179.22667
	EUAL-LS-LT3-3	VEG	7/2/2011	0.054 ± 0.004	0.003	0.455 ± 0.034	0.025		51.43	179.22667
Rockweed	FUCU-LS-DUP	VEG	6/22/2011	0.003	0.003	0.016	0.016	U	51.447472	179.190888
	FUCU-LS-LT1-1	VEG	6/22/2011	0.003	0.003	0.016	0.016	U	51.447527	179.189361
	FUCU-LS-LT1-2	VEG	6/22/2011	0.003	0.003	0.018	0.018	U	51.447527	179.189361
	FUCU-LS-LT1-3	VEG	6/22/2011	0.003	0.003	0.02	0.02	U	51.448777	179.189305
	FUCU-LS-LT2-1	VEG	6/22/2011	0.002	0.002	0.016	0.016	U	51.447222	179.199361
	FUCU-LS-LT2-2	VEG	6/22/2011	0.0048 ± 0.001	0.002	0.035 ± 0.007	0.014	J	51.44625	179.196972
	FUCU-LS-LT2-3	VEG	6/22/2011	0.002	0.002	0.012	0.012	U	51.446722	179.191888
	FUCU-LS-LT3-1	VEG	7/2/2011	0.003	0.003	0.015	0.015	U	51.433611	179.219305
	FUCU-LS-LT3-2	VEG	7/2/2011	0.003	0.003	0.014	0.014	U	51.430166	179.218694
	FUCU-LS-LT3-3	VEG	7/2/2011	0.003	0.003	0.011	0.011	U	51.430166	179.218694
Greenling - whole	GREN-LS-DUP	FAUNA	7/12/2011	0.03	0.03	0.146	0.146	U	51.434527	179.234416
	GREN-LS-LT1-1	FAUNA	7/4/2011	0.03	0.03	0.141	0.141	U	51.457555	179.195138
	GREN-LS-LT1-2	FAUNA	7/4/2011	0.04	0.04	0.189	0.189	U	51.457555	179.195138
	GREN-LS-LT1-3	FAUNA	7/5/2011	0.04	0.04	0.187	0.187	U	51.457555	179.195138
	GREN-LS-LT2-1	FAUNA	7/3/2011	0.03	0.03	0.145	0.145	U	51.432194	179.230277
	GREN-LS-LT2-2	FAUNA	7/3/2011	0.02	0.02	0.092	0.092	U	51.432194	179.230277
	GREN-LS-LT2-3	FAUNA	7/3/2011	0.02	0.02	0.095	0.095	U	51.432194	179.230277
	GREN-LS-LT3-1	FAUNA	7/3/2011	0.02	0.02	0.089	0.089	U	51.43	179.22667
	GREN-LS-LT3-2	FAUNA	7/12/2011	0.03	0.03	0.147	0.147	U	51.434527	179.234416
	GREN-LS-LT3-3	FAUNA	7/12/2011	0.03	0.03	0.145	0.145	U	51.434527	179.234416
Halibut - whole	HALI-LS-L2M-1	FAUNA	7/13/2011	0.003	0.003	0.012	0.012	U	51.40025	179.283361

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Horse Mussel - soft tissue only	HMUS-LS-LT1-1	FAUNA	7/5/2011	0.1	0.1	0.428	0.428	U	51.457555	179.195138
	HMUS-LS-LT2-1	FAUNA	7/4/2011	0.08	0.08	0.327	0.327	U	51.44925	179.205583
	HMUS-LS-LT3-1	FAUNA	7/3/2011	1	1	2.097	2.097	U	51.44925	179.205583
Irish Lord - whole	IRLO-LS-LT1-1	FAUNA	7/4/2011	0.04	0.04	0.189	0.189	U	51.457555	179.195138
	IRLO-LS-LT1-2	FAUNA	7/4/2011	0.04	0.04	0.189	0.189	U	51.457555	179.195138
	IRLO-LS-LT1-3	FAUNA	7/5/2011	0.02	0.02	0.106	0.106	U	51.457555	179.195138
	IRLO-LS-LT2-1	FAUNA	7/3/2011	0.03	0.03	0.13	0.13	U	51.432194	179.230277
	IRLO-LS-LT2-2	FAUNA	7/3/2011	0.04	0.04	0.166	0.166	U	51.432194	179.230277
	IRLO-LS-LT2-3	FAUNA	7/3/2011	0.04	0.04	0.177	0.177	U	51.432194	179.230277
	IRLO-LS-LT3-1	FAUNA	7/2/2011	0.01	0.01	0.045	0.045	U	51.43	179.22667
	IRLO-LS-LT3-2	FAUNA	7/12/2011	0.02	0.02	0.095	0.095	U	51.434944	179.2315
	IRLO-LS-LT3-3	FAUNA	7/12/2011	0.02	0.02	0.11	0.11	U	51.434944	179.2315
Octopus	OCTP-LS-L2M-1	FAUNA	7/3/2011	0.003	0.003	0.021	0.021	U	51.44925	179.205583
Pacific Cod - whole	PCOD-LS-L2M-1	FAUNA	7/4/2011	0.003	0.003	0.015	0.015	U	51.451805	179.196972
Rockfish - whole	ROCK-LS-DUP	FAUNA	7/12/2011	0.02	0.02	0.078	0.078	U	51.434944	179.2315
	ROCK-LS-DUP2	FAUNA	7/12/2011	0.02	0.02	0.086	0.086	U	51.465472	179.206722
	ROCK-LS-LT1-1	FAUNA	7/4/2011	0.03	0.03	0.139	0.139	U	51.457555	179.195138
	ROCK-LS-LT1-2	FAUNA	7/12/2011	0.02	0.02	0.083	0.083	U	51.465472	179.206722
	ROCK-LS-LT1-3	FAUNA	7/12/2011	0.02	0.02	0.083	0.083	U	51.465472	179.206722
	ROCK-LS-LT2-1	FAUNA	7/4/2011	0.02	0.02	0.08	0.08	U	51.44925	179.205583
	ROCK-LS-LT2-2	FAUNA	7/12/2011	0.02	0.02	0.079	0.079	U	51.44625	179.223416
	ROCK-LS-LT3-1	FAUNA	7/12/2011	0.02	0.02	0.088	0.088	U	51.434944	179.2315
	ROCK-LS-LT3-2	FAUNA	7/12/2011	0.02	0.02	0.085	0.085	U	51.434944	179.2315
	ROCK-LS-LT3-3	FAUNA	7/3/2011	0.02	0.02	0.069	0.069	U	51.43	179.22667
Reindeer Lichen	STRL-AI-LT1-2	VEG	6/22/2011	0.03	0.03	0.091	0.091	U	51.447361	179.189111
Sea Urchin - whole	URCH-LS-LT1-1	FAUNA	7/4/2011	0.03	0.03	0.117	0.117	U	51.457555	179.195138
	URCH-LS-LT2-1	FAUNA	7/3/2011	0.03	0.03	0.115	0.115	U	51.44925	179.205583
	URCH-LS-LT3-1	FAUNA	7/2/2011	0.03	0.03	0.117	0.117	U	51.43	179.22667
Amchitka Site (Milrow) (AMC03)										
Chiton	CHIT-ML-MT1-1	FAUNA	7/9/2011	0.04	0.04	0.151	0.151	U	51.408472	179.139166
	CHIT-ML-MT2-1	FAUNA	7/10/2011	0.03	0.03	0.139	0.139	U	51.389416	179.173138
	CHIT-ML-MT3-1	FAUNA	7/10/2011	0.04	0.04	0.182	0.182	U	51.387805	179.184

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Dragon Kelp	EUAL-ML-DUP	VEG	7/9/2011	0.053 ± 0.004	0.003	0.399 ± 0.03	0.023		51.408472	179.139166
	EUAL-ML-MT1-1	VEG	7/9/2011	0.074 ± 0.004	0.003	0.592 ± 0.032	0.024		51.408472	179.139166
	EUAL-ML-MT1-2	VEG	7/9/2011	0.06 ± 0.004	0.003	0.446 ± 0.03	0.022		51.408472	179.139166
	EUAL-ML-MT1-3	VEG	7/9/2011	0.078 ± 0.004	0.003	0.656 ± 0.034	0.025		51.408472	179.139166
	EUAL-ML-MT2-1	VEG	7/10/2011	0.096 ± 0.006	0.004	0.715 ± 0.045	0.03		51.389416	179.173138
	EUAL-ML-MT2-2	VEG	7/10/2011	0.085 ± 0.004	0.003	0.602 ± 0.028	0.021		51.389416	179.173138
	EUAL-ML-MT2-3	VEG	7/10/2011	0.022 ± 0.002	0.004	0.166 ± 0.015	0.03		51.389416	179.173138
	EUAL-ML-MT3-1	VEG	7/10/2011	0.129 ± 0.004	0.003	0.907 ± 0.028	0.021		51.387805	179.184
	EUAL-ML-MT3-2	VEG	7/10/2011	0.026 ± 0.002	0.003	0.19 ± 0.015	0.022		51.387805	179.184
	EUAL-ML-MT3-3	VEG	7/10/2011	0.117 ± 0.004	0.003	0.807 ± 0.028	0.021		51.387805	179.184
Rockweed	FUCU-ML-DUP	VEG	6/20/2011	0.003	0.003	0.013	0.013	U	51.412449	179.160843
	FUCU-ML-MT1-1	VEG	6/20/2011	0.003	0.003	0.012	0.012	U	51.412449	179.160843
	FUCU-ML-MT1-2	VEG	6/21/2011	0.003	0.003	0.018	0.018	U	51.417083	179.134083
	FUCU-ML-MT1-3	VEG	7/9/2011	0.003	0.003	0.014	0.014	U	51.417083	179.134083
	FUCU-ML-MT2-1	VEG	6/20/2011	0.003	0.003	0.015	0.015	U	51.403305	179.167166
	FUCU-ML-MT2-2	VEG	6/21/2011	0.003	0.003	0.021	0.021	U	51.405694	179.161361
	FUCU-ML-MT2-3	VEG	6/21/2011	0.003	0.003	0.021	0.021	U	51.405694	179.161361
	FUCU-ML-MT3-1	VEG	7/10/2011	0.003	0.003	0.015	0.015	U	51.389416	179.173138
	FUCU-ML-MT3-2	VEG	7/10/2011	0.003	0.003	0.014	0.014	U	51.389416	179.173138
	FUCU-ML-MT3-3	VEG	7/10/2011	0.008 ± 0.002	0.003	0.04 ± 0.01	0.015	J	51.389416	179.173138
Greenling - whole	GREN-ML-DUP	FAUNA	7/10/2011	0.03	0.03	0.145	0.145	U	51.387805	179.184
	GREN-ML-MT1-1	FAUNA	7/9/2011	0.02	0.02	0.087	0.087	U	51.408472	179.139166
	GREN-ML-MT1-2	FAUNA	7/9/2011	0.03	0.03	0.139	0.139	U	51.408472	179.139166
	GREN-ML-MT1-3	FAUNA	7/9/2011	0.02	0.02	0.097	0.097	U	51.408472	179.139166
	GREN-ML-MT2-1	FAUNA	7/11/2011	0.03	0.03	0.14	0.14	U	51.396944	179.1435
	GREN-ML-MT2-2	FAUNA	7/11/2011	0.03	0.03	0.14	0.14	U	51.396944	179.1435
	GREN-ML-MT2-3	FAUNA	7/11/2011	0.03	0.03	0.143	0.143	U	51.396944	179.1435
	GREN-ML-MT3-1	FAUNA	7/10/2011	0.03	0.03	0.145	0.145	U	51.387805	179.184
	GREN-ML-MT3-2	FAUNA	7/10/2011	0.04	0.04	0.193	0.193	U	51.387805	179.184
	GREN-ML-MT3-3	FAUNA	7/10/2011	0.03	0.03	0.142	0.142	U	51.387805	179.184
Halibut - whole	HALI-ML-M2M-1	FAUNA	7/11/2011	0.003	0.003	0.01	0.01	U	51.365055	179.111472
Horse Mussel - soft tissue only	HMUS-ML-MT1-1	FAUNA	7/9/2011	0.1	0.1	0.455	0.455	U	51.408472	179.139166
	HMUS-ML-MT2-1	FAUNA	7/11/2011	0.1	0.1	0.45	0.45	U	51.389416	179.173138
	HMUS-ML-MT3-1	FAUNA	7/10/2011	0.1	0.1	0.459	0.459	U	51.387805	179.184

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Irish Lord - whole	IRLO-ML-MT1-1	FAUNA	7/9/2011	0.02	0.02	0.085	0.085	U	51.408472	179.139166
	IRLO-ML-MT1-2	FAUNA	7/9/2011	0.02	0.02	0.095	0.095	U	51.408472	179.139166
	IRLO-ML-MT1-3	FAUNA	7/9/2011	0.04	0.04	0.187	0.187	U	51.408472	179.139166
	IRLO-ML-MT2-1	FAUNA	7/10/2011	0.02	0.02	0.086	0.086	U	51.389416	179.173138
	IRLO-ML-MT2-2	FAUNA	7/11/2011	0.04	0.04	0.172	0.172	U	51.396944	179.1435
	IRLO-ML-MT2-3	FAUNA	7/11/2011	0.04	0.04	0.19	0.19	U	51.396944	179.1435
	IRLO-ML-MT3-1	FAUNA	7/10/2011	0.02	0.02	0.113	0.113	U	51.387805	179.184
	IRLO-ML-MT3-2	FAUNA	7/10/2011	0.02	0.02	0.097	0.097	U	51.387805	179.184
	IRLO-ML-MT3-3	FAUNA	7/10/2011	0.02	0.02	0.112	0.112	U	51.387805	179.184
Octopus	OCTP-ML-M2M-1	FAUNA	7/10/2011	0.03	0.03	0.141	0.141	U	51.389416	179.173138
Pacific Cod - whole	PCOD-ML-M2M-1	FAUNA	7/10/2011	0.003	0.003	0.016	0.016	U	51.408472	179.139166
Rockfish - whole	ROCK-ML-DUP	FAUNA	7/9/2011	0.02	0.02	0.088	0.088	U	51.408472	179.139166
	ROCK-ML-MT1-1	FAUNA	7/9/2011	0.02	0.02	0.088	0.088	U	51.408472	179.139166
	ROCK-ML-MT1-2	FAUNA	7/9/2011	0.02	0.02	0.088	0.088	U	51.408472	179.139166
	ROCK-ML-MT1-3	FAUNA	7/9/2011	0.02	0.02	0.085	0.085	U	51.408472	179.139166
	ROCK-ML-MT2-1	FAUNA	7/11/2011	0.02	0.02	0.075	0.075	U	51.365055	179.111472
	ROCK-ML-MT2-2	FAUNA	7/11/2011	0.02	0.02	0.081	0.081	U	51.365055	179.111472
	ROCK-ML-MT2-3	FAUNA	7/11/2011	0.02	0.02	0.09	0.09	U	51.365055	179.111472
	ROCK-ML-MT3-1	FAUNA	7/10/2011	0.02	0.02	0.094	0.094	U	51.387805	179.184
	ROCK-ML-MT3-2	FAUNA	7/10/2011	0.01	0.01	0.036	0.036	U	51.387805	179.184
	ROCK-ML-MT3-3	FAUNA	7/10/2011	0.01	0.01	0.023	0.023	U	51.387805	179.184
Reindeer Lichen	STRL-AI-ML-1	VEG	6/21/2011	0.03	0.03	0.107	0.107	U	51.402583	179.183972
Sea Urchin - whole	URCH-ML-MT1-1	FAUNA	7/9/2011	0.02	0.02	0.074	0.074	U	51.408472	179.139166
	URCH-ML-MT2-1	FAUNA	7/10/2011	0.03	0.03	0.112	0.112	U	51.389416	179.173138
	URCH-ML-MT3-1	FAUNA	7/10/2011	0.03	0.03	0.119	0.119	U	51.387805	179.184
Amchitka Site (Cannikin) (AMC05)										
Chiton	CHIT-CN-CT1-1	FAUNA	7/8/2011	0.04	0.04	0.187	0.187	U	51.482972	179.123833
	CHIT-CN-CT2-1	FAUNA	7/7/2011	0.03	0.03	0.142	0.142	U	51.472611	179.151111
	CHIT-CN-CT3-1	FAUNA	7/5/2011	0.04	0.04	0.196	0.196	U	51.471416	179.172861

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Dragon Kelp	EUAL-CN-CT1-1	VEG	7/8/2011	0.061 ± 0.004	0.003	0.452 ± 0.03	0.022		51.482972	179.123833
	EUAL-CN-CT1-2	VEG	7/8/2011	0.007 ± 0.002	0.003	0.046 ± 0.013	0.02	J	51.482972	179.123833
	EUAL-CN-CT1-3	VEG	7/8/2011	0.024 ± 0.002	0.003	0.147 ± 0.012	0.018		51.482972	179.123833
	EUAL-CN-CT2-1	VEG	7/6/2011	0.02 ± 0.004	0.003	0.128 ± 0.026	0.019		51.472611	179.151111
	EUAL-CN-CT2-2	VEG	7/6/2011	0.023 ± 0.004	0.003	0.144 ± 0.025	0.019		51.472611	179.151111
	EUAL-CN-CT2-3	VEG	7/7/2011	0.052 ± 0.004	0.003	0.377 ± 0.029	0.022		51.472611	179.151111
	EUAL-CN-CT3-1	VEG	7/5/2011	0.003	0.003	0.021	0.021	U	51.471416	179.172861
	EUAL-CN-CT3-2	VEG	7/5/2011	0.008 ± 0.002	0.003	0.058 ± 0.014	0.022	J	51.471416	179.172861
	EUAL-CN-CT3-3	VEG	7/5/2011	0.003	0.003	0.019	0.019	U	51.471416	179.172861
	EUAL-CN-DUP	VEG	7/6/2011	0.026 ± 0.002	0.003	0.173 ± 0.013	0.02		51.471416	179.172861
Rockweed	FUCU-CN-CT1-1	VEG	6/23/2011	0.003	0.003	0.017	0.017	U	51.481888	179.118138
	FUCU-CN-CT1-2	VEG	6/23/2011	0.003	0.003	0.019	0.019	U	51.481888	179.118138
	FUCU-CN-CT1-3	VEG	6/23/2011	0.003	0.003	0.018	0.018	U	51.481888	179.118138
	FUCU-CN-CT2-1	VEG	7/8/2011	0.003	0.003	0.012	0.012	U	51.476638	179.135277
	FUCU-CN-CT2-2	VEG	7/8/2011	0.003	0.003	0.013	0.013	U	51.476638	179.135277
	FUCU-CN-CT2-3	VEG	7/12/2011	0.003	0.003	0.016	0.016	U	51.467583	179.153583
	FUCU-CN-CT3-1	VEG	7/6/2011	0.003	0.003	0.016	0.016	U	51.465027	179.173166
	FUCU-CN-CT3-2	VEG	7/6/2011	0.003	0.003	0.018	0.018	U	51.465472	179.170583
	FUCU-CN-CT3-3	VEG	7/6/2011	0.003	0.003	0.019	0.019	U	51.464638	179.159305
	FUCU-CN-DUP	VEG	6/23/2011	0.003	0.003	0.019	0.019	U	51.481888	179.118138
Greenling - whole	GREN-CN-CT1-1	FAUNA	7/8/2011	0.03	0.03	0.145	0.145	U	51.482972	179.123833
	GREN-CN-CT1-2	FAUNA	7/8/2011	0.03	0.03	0.142	0.142	U	51.482972	179.123833
	GREN-CN-CT1-3	FAUNA	7/8/2011	0.03	0.03	0.137	0.137	U	51.482972	179.123833
	GREN-CN-CT2-1	FAUNA	7/7/2011	0.02	0.02	0.097	0.097	U	51.472611	179.151111
	GREN-CN-CT2-2	FAUNA	7/7/2011	0.03	0.03	0.138	0.138	U	51.472611	179.151111
	GREN-CN-CT2-3	FAUNA	7/7/2011	0.02	0.02	0.092	0.092	U	51.472611	179.151111
	GREN-CN-CT3-1	FAUNA	7/5/2011	0.03	0.03	0.137	0.137	U	51.471416	179.172861
	GREN-CN-CT3-2	FAUNA	7/5/2011	0.02	0.02	0.087	0.087	U	51.471416	179.172861
	GREN-CN-CT3-3	FAUNA	7/5/2011	0.02	0.02	0.092	0.092	U	51.471416	179.172861
	GREN-CN-DUP	FAUNA	7/8/2011	0.03	0.03	0.145	0.145	U	51.482972	179.123833
Halibut - whole	HALI-CN-C2M-1	FAUNA	7/13/2011	0.003	0.003	0.012	0.012	U	51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-CN-CT1-1	FAUNA	7/8/2011	0.1	0.1	0.411	0.411	U	51.482972	179.123833
	HMUS-CN-CT2-1	FAUNA	7/7/2011	0.1	0.1	0.453	0.453	U	51.472611	179.151111
	HMUS-CN-CT3-1	FAUNA	7/5/2011	0.09	0.09	0.369	0.369	U	51.471416	179.172861

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Irish Lord - whole	IRLO-CN-CT1-1	FAUNA	7/8/2011	0.04	0.04	0.18	0.18	U	51.482972	179.123833
	IRLO-CN-CT1-2	FAUNA	7/8/2011	0.02	0.02	0.1	0.1	U	51.482972	179.123833
	IRLO-CN-CT1-3	FAUNA	7/8/2011	0.04	0.04	0.188	0.188	U	51.482972	179.123833
	IRLO-CN-CT2-1	FAUNA	7/7/2011	0.02	0.02	0.094	0.094	U	51.472611	179.151111
	IRLO-CN-CT2-2	FAUNA	7/7/2011	0.03	0.03	0.137	0.137	U	51.472611	179.151111
	IRLO-CN-CT2-3	FAUNA	7/7/2011	0.02	0.02	0.098	0.098	U	51.472611	179.151111
	IRLO-CN-CT3-1	FAUNA	7/5/2011	0.04	0.04	0.206	0.206	U	51.471416	179.172861
	IRLO-CN-CT3-2	FAUNA	7/5/2011	0.02	0.02	0.097	0.097	U	51.471416	179.172861
	IRLO-CN-CT3-3	FAUNA	7/5/2011	0.02	0.02	0.096	0.096	U	51.471416	179.172861
Octopus	OCTP-CN-C2M-1	FAUNA	7/8/2011	0.01	0.01	0.049	0.049	U	51.482972	179.123833
Pacific Cod - whole	PCOD-CN-C2M-1	FAUNA	7/6/2011	0.003	0.003	0.014	0.014	U	51.483527	179.187583
Rockfish - whole	ROCK-CN-CT1-1	FAUNA	7/8/2011	0.02	0.02	0.079	0.079	U	51.482972	179.123833
	ROCK-CN-CT1-2	FAUNA	7/8/2011	0.02	0.02	0.077	0.077	U	51.482972	179.123833
	ROCK-CN-CT1-3	FAUNA	7/8/2011	0.02	0.02	0.08	0.08	U	51.482972	179.123833
	ROCK-CN-CT2-1	FAUNA	7/6/2011	0.01	0.01	0.035	0.035	U	51.472611	179.151111
	ROCK-CN-CT2-2	FAUNA	7/6/2011	0.02	0.02	0.073	0.073	U	51.472611	179.151111
	ROCK-CN-CT2-3	FAUNA	7/6/2011	0.02	0.02	0.082	0.082	U	51.472611	179.151111
	ROCK-CN-CT3-1	FAUNA	7/6/2011	0.02	0.02	0.085	0.085	U	51.471416	179.172861
	ROCK-CN-CT3-2	FAUNA	7/6/2011	0.01	0.01	0.038	0.038	U	51.471416	179.172861
	ROCK-CN-CT3-3	FAUNA	7/6/2011	0.02	0.02	0.084	0.084	U	51.471416	179.172861
	ROCK-CN-DUP	FAUNA	7/6/2011	0.02	0.02	0.08	0.08	U	51.471416	179.172861
Reindeer Lichen	STRL-AI-CT1-1	VEG	6/23/2011	0.04	0.04	0.063	0.063	U	51.480583	179.109472
Sea Urchin - whole	URCH-CN-CT1-1	FAUNA	7/8/2011	0.065 ± 0.012	0.02	0.261 ± 0.048	0.08		51.482972	179.123833
	URCH-CN-CT2-1	FAUNA	7/7/2011	0.03	0.03	0.103	0.103	U	51.472611	179.151111
	URCH-CN-CT3-1	FAUNA	7/5/2011	0.02	0.02	0.077	0.077	U	51.471416	179.172861
Amchitka Site (Adak Island) (AMC13)										
Dolly Varden - whole	DOLL-AD-XXX-1	FAUNA	6/28/2011	0.01	0.01	0.041	0.041	U	51.8375	-176.672555
Reindeer Lichen	STRL-AD-XXX-1	VEG	6/28/2011	0.19 ± 0.02	0.03	0.372 ± 0.039	0.059		51.837527	-176.670694
	STRL-AD-XXX-2	VEG	6/29/2011	0.062 ± 0.01	0.02	0.153 ± 0.025	0.049		51.872833	-176.707444
	STRL-AD-XXX-3	VEG	6/29/2011	0.13 ± 0.02	0.03	0.207 ± 0.032	0.048		51.900805	-176.688527
Amchitka Site (Adak Island North) (AMC14)										
Chiton	CHIT-AN-ANT1-1	FAUNA	7/20/2011	0.02	0.02	0.097	0.097	U	51.838722	-176.582805
	CHIT-AN-ANT2-1	FAUNA	7/18/2011	0.02	0.02	0.1	0.1	U	51.848361	-176.506277
	CHIT-AN-ANT3-1	FAUNA	7/17/2011	0.02	0.02	0.102	0.102	U	51.853722	-176.470694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Dragon Kelp	EUAL-AN-ANT1-1	VEG	7/19/2011	0.04 ± 0.002	0.003	0.335 ± 0.017	0.025		51.835694	-176.542138
	EUAL-AN-ANT1-2	VEG	7/19/2011	0.01 ± 0.002	0.003	0.068 ± 0.014	0.02		51.835694	-176.542138
	EUAL-AN-ANT1-3	VEG	7/19/2011	0.03 ± 0.002	0.003	0.232 ± 0.015	0.023		51.835694	-176.542138
	EUAL-AN-ANT2-1	VEG	7/18/2011	0.017 ± 0.002	0.003	0.124 ± 0.015	0.022		51.848361	-176.506277
	EUAL-AN-ANT2-2	VEG	7/18/2011	0.028 ± 0.004	0.003	0.178 ± 0.025	0.019		51.848361	-176.506277
	EUAL-AN-ANT2-3	VEG	7/18/2011	0.042 ± 0.004	0.003	0.292 ± 0.028	0.021		51.848361	-176.506277
	EUAL-AN-ANT3-1	VEG	7/17/2011	0.037 ± 0.004	0.004	0.277 ± 0.03	0.03		51.853722	-176.470694
	EUAL-AN-ANT3-2	VEG	7/17/2011	0.007 ± 0.002	0.003	0.048 ± 0.014	0.02	J	51.853722	-176.470694
	EUAL-AN-ANT3-3	VEG	7/17/2011	0.012 ± 0.002	0.003	0.081 ± 0.013	0.02		51.853722	-176.470694
	EUAL-AN-DUP	VEG	7/17/2011	0.017 ± 0.002	0.003	0.107 ± 0.013	0.019		51.853722	-176.470694
Rockweed	FUCU-AN-ANT1-1	VEG	7/19/2011	0.011 ± 0.002	0.003	0.056 ± 0.01	0.015		51.841444	-176.546083
	FUCU-AN-ANT1-2	VEG	7/20/2011	0.003	0.003	0.019	0.019	U	51.8395	-176.591305
	FUCU-AN-ANT1-3	VEG	7/20/2011	0.003	0.003	0.016	0.016	U	51.8395	-176.591305
	FUCU-AN-ANT2-1	VEG	7/18/2011	0.003	0.003	0.019	0.019	U	51.837666	-176.517527
	FUCU-AN-ANT2-2	VEG	7/18/2011	0.003	0.003	0.016	0.016	U	51.841444	-176.546083
	FUCU-AN-ANT2-3	VEG	7/18/2011	0.003	0.003	0.013	0.013	U	51.8395	-176.591305
	FUCU-AN-ANT3-1	VEG	7/18/2011	0.003	0.003	0.017	0.017	U	51.839944	-176.515916
	FUCU-AN-ANT3-2	VEG	7/18/2011	0.003	0.003	0.015	0.015	U	51.828972	-176.448305
	FUCU-AN-ANT3-3	VEG	7/18/2011	0.003	0.003	0.015	0.015	U	51.830833	-176.456361
	FUCU-AN-DUP	VEG	7/18/2011	0.003	0.003	0.014	0.014	U	51.828972	-176.448305
Greenling - whole	GREN-AN-ANT1-1	FAUNA	7/19/2011	0.03	0.03	0.133	0.133	U	51.835694	-176.542138
	GREN-AN-ANT1-2	FAUNA	7/19/2011	0.03	0.03	0.125	0.125	U	51.835694	-176.542138
	GREN-AN-ANT1-3	FAUNA	7/19/2011	0.03	0.03	0.109	0.109	U	51.835694	-176.542138
	GREN-AN-ANT2-1	FAUNA	7/18/2011	0.03	0.03	0.139	0.139	U	51.848361	-176.506277
	GREN-AN-ANT2-2	FAUNA	7/18/2011	0.03	0.03	0.139	0.139	U	51.848361	-176.506277
	GREN-AN-ANT2-3	FAUNA	7/18/2011	0.03	0.03	0.142	0.142	U	51.848361	-176.506277
	GREN-AN-ANT3-1	FAUNA	7/17/2011	0.03	0.03	0.137	0.137	U	51.853722	-176.470694
	GREN-AN-ANT3-2	FAUNA	7/17/2011	0.03	0.03	0.139	0.139	U	51.853722	-176.470694
	GREN-AN-ANT3-3	FAUNA	7/17/2011	0.03	0.03	0.14	0.14	U	51.853722	-176.470694
	GREN-AN-DUP	FAUNA	7/17/2011	0.03	0.03	0.143	0.143	U	51.853722	-176.470694
Halibut - whole	HALI-AN-AN2M-1	FAUNA	7/17/2011	0.002	0.002	0.007	0.007	U	51.853722	-176.470694
	HALI-AN-DUP	FAUNA	7/17/2011	0.003	0.003	0.01	0.01	U	51.853722	-176.470694
Horse Mussel - soft tissue only	HMUS-AN-ANT1-1	FAUNA	7/20/2011	0.08	0.08	0.437	0.437	U	51.838722	-176.582805
	HMUS-AN-ANT2-1	FAUNA	7/18/2011	0.09	0.09	0.413	0.413	U	51.848361	-176.506277
	HMUS-AN-ANT3-1	FAUNA	7/18/2011	0.07	0.07	0.312	0.312	U	51.853722	-176.470694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Irish Lord - whole	IRLO-AN-ANT1-1	FAUNA	7/19/2011	0.03	0.03	0.141	0.141	U	51.835694	-176.542138
	IRLO-AN-ANT1-2	FAUNA	7/19/2011	0.04	0.04	0.178	0.178	U	51.835694	-176.542138
	IRLO-AN-ANT1-3	FAUNA	7/19/2011	0.02	0.02	0.088	0.088	U	51.835694	-176.542138
	IRLO-AN-ANT2-1	FAUNA	7/19/2011	0.03	0.03	0.142	0.142	U	51.848361	-176.506277
	IRLO-AN-ANT2-2	FAUNA	7/19/2011	0.02	0.02	0.093	0.093	U	51.848361	-176.506277
	IRLO-AN-ANT2-3	FAUNA	7/19/2011	0.02	0.02	0.095	0.095	U	51.848361	-176.506277
	IRLO-AN-ANT3-1	FAUNA	7/17/2011	0.02	0.02	0.096	0.096	U	51.853722	-176.470694
	IRLO-AN-ANT3-2	FAUNA	7/17/2011	0.02	0.02	0.09	0.09	U	51.853722	-176.470694
	IRLO-AN-ANT3-3	FAUNA	7/17/2011	0.02	0.02	0.09	0.09	U	51.853722	-176.470694
Octopus	OCTP-AN-AN2M-1	FAUNA	7/18/2011	0.01	0.01	0.051	0.051	U	51.848361	-176.506277
Pacific Cod - whole	PCOD-AN-AN2M-1	FAUNA	7/17/2011	0.003	0.003	0.015	0.015	U	51.853722	-176.470694
Rockfish - whole	ROCK-AN-ANT1-1	FAUNA	7/19/2011	0.01	0.01	0.037	0.037	U	51.835694	-176.542138
	ROCK-AN-ANT2-1	FAUNA	7/18/2011	0.01	0.01	0.037	0.037	U	51.848361	-176.506277
	ROCK-AN-ANT2-2	FAUNA	7/18/2011	0.01	0.01	0.041	0.041	U	51.848361	-176.506277
	ROCK-AN-ANT3-1	FAUNA	7/17/2011	0.02	0.02	0.071	0.071	U	51.853722	-176.470694
	ROCK-AN-ANT3-2	FAUNA	7/17/2011	0.01	0.01	0.039	0.039	U	51.853722	-176.470694
	ROCK-AN-ANT3-3	FAUNA	7/17/2011	0.03	0.03	0.118	0.118	U	51.853722	-176.470694
Sea Urchin - whole	URCH-AN-ANT1-1	FAUNA	7/19/2011	0.02	0.02	0.068	0.068	U	51.835694	-176.542138
	URCH-AN-ANT2-1	FAUNA	7/18/2011	0.02	0.02	0.073	0.073	U	51.848361	-176.506277
	URCH-AN-ANT3-1	FAUNA	7/17/2011	0.02	0.02	0.076	0.076	U	51.853722	-176.470694
Amchitka Site (Adak Island South) (AMC15)										
Chiton	CHIT-AS-AST1-1	FAUNA	7/15/2011	0.03	0.03	0.123	0.123	U	51.737472	-176.48025
	CHIT-AS-AST2-1	FAUNA	7/16/2011	0.02	0.02	0.102	0.102	U	51.745666	-176.507055
	CHIT-AS-AST3-1	FAUNA	7/14/2011	0.03	0.03	0.141	0.141	U	51.688333	-176.63375
Dragon Kelp	EUAL-AS-AST1-1	VEG	7/15/2011	0.012 ± 0.002	0.003	0.079 ± 0.013	0.02		51.737472	-176.48025
	EUAL-AS-AST1-2	VEG	7/15/2011	0.047 ± 0.002	0.003	0.374 ± 0.016	0.024		51.737472	-176.48025
	EUAL-AS-AST1-3	VEG	7/15/2011	0.077 ± 0.004	0.003	0.739 ± 0.038	0.029		51.737472	-176.48025
	EUAL-AS-AST2-1	VEG	7/16/2011	0.029 ± 0.002	0.003	0.206 ± 0.014	0.021		51.745666	-176.507055
	EUAL-AS-AST2-2	VEG	7/16/2011	0.015 ± 0.002	0.003	0.106 ± 0.014	0.021		51.745666	-176.507055
	EUAL-AS-AST2-3	VEG	7/16/2011	0.016 ± 0.002	0.003	0.116 ± 0.015	0.022		51.745666	-176.507055
	EUAL-AS-AST3-1	VEG	7/14/2011	0.081 ± 0.004	0.003	0.592 ± 0.029	0.022		51.688333	-176.63375
	EUAL-AS-AST3-2	VEG	7/14/2011	0.09 ± 0.004	0.003	0.853 ± 0.038	0.028		51.688333	-176.63375
	EUAL-AS-AST3-3	VEG	7/14/2011	0.086 ± 0.004	0.003	0.758 ± 0.035	0.026		51.688333	-176.63375
	EUAL-AS-DUP	VEG	7/14/2011	0.03 ± 0.002	0.003	0.221 ± 0.015	0.022		51.688333	-176.63375

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockweed	FUCU-AS-AST1-1	VEG	7/16/2011	0.003	0.003	0.019	0.019	U	51.733666	-176.470805
	FUCU-AS-AST1-2	VEG	7/16/2011	0.003	0.003	0.017	0.017	U	51.733666	-176.470805
	FUCU-AS-AST1-3	VEG	7/16/2011	0.008 ± 0.002	0.003	0.043 ± 0.011	0.016	J	51.733666	-176.470805
	FUCU-AS-AST2-1	VEG	7/16/2011	0.003	0.003	0.015	0.015	U	51.745666	-176.507055
	FUCU-AS-AST2-2	VEG	7/16/2011	0.003	0.003	0.015	0.015	U	51.745666	-176.507055
	FUCU-AS-AST2-3	VEG	7/16/2011	0.003	0.003	0.015	0.015	U	51.745666	-176.507055
	FUCU-AS-AST3-1	VEG	7/14/2011	0.003	0.003	0.016	0.016	U	51.688333	-176.63375
	FUCU-AS-AST3-2	VEG	7/14/2011	0.006 ± 0.002	0.003	0.03 ± 0.01	0.015	J	51.688333	-176.63375
	FUCU-AS-AST3-3	VEG	7/14/2011	0.002	0.002	0.011	0.011	U	51.688333	-176.63375
	FUCU-AS-DUP	VEG	7/16/2011	0.003	0.003	0.016	0.016	U	51.733666	-176.470805
Greenling - whole	GREN-AS-AST1-1	FAUNA	7/15/2011	0.03	0.03	0.143	0.143	U	51.737472	-176.48025
	GREN-AS-AST1-2	FAUNA	7/15/2011	0.03	0.03	0.142	0.142	U	51.737472	-176.48025
	GREN-AS-AST1-3	FAUNA	7/15/2011	0.03	0.03	0.144	0.144	U	51.737472	-176.48025
	GREN-AS-AST2-1	FAUNA	7/16/2011	0.02	0.02	0.08	0.08	U	51.745666	-176.507055
	GREN-AS-AST2-2	FAUNA	7/16/2011	0.03	0.03	0.137	0.137	U	51.745666	-176.507055
	GREN-AS-AST2-3	FAUNA	7/16/2011	0.03	0.03	0.14	0.14	U	51.745666	-176.507055
	GREN-AS-AST3-1	FAUNA	7/14/2011	0.03	0.03	0.143	0.143	U	51.688333	-176.63375
	GREN-AS-AST3-2	FAUNA	7/14/2011	0.03	0.03	0.141	0.141	U	51.688333	-176.63375
	GREN-AS-AST3-3	FAUNA	7/14/2011	0.04	0.04	0.191	0.191	U	51.688333	-176.63375
	GREN-AS-DUP	FAUNA	7/14/2011	0.03	0.03	0.15	0.15	U	51.688333	-176.63375
Horse Mussel - soft tissue only	HMUS-AS-AST1-1	FAUNA	7/15/2011	0.1	0.1	0.501	0.501	U	51.737472	-176.48025
	HMUS-AS-AST2-1	FAUNA	7/16/2011	0.08	0.08	0.507	0.507	U	51.745666	-176.507055
	HMUS-AS-AST3-1	FAUNA	7/14/2011	0.1	0.1	0.51	0.51	U	51.688333	-176.63375
Irish Lord - whole	IRLO-AS-AST1-1	FAUNA	7/15/2011	0.04	0.04	0.176	0.176	U	51.737472	-176.48025
	IRLO-AS-AST1-2	FAUNA	7/15/2011	0.03	0.03	0.14	0.14	U	51.737472	-176.48025
	IRLO-AS-AST1-3	FAUNA	7/15/2011	0.03	0.03	0.137	0.137	U	51.737472	-176.48025
	IRLO-AS-AST2-1	FAUNA	7/16/2011	0.03	0.03	0.14	0.14	U	51.745666	-176.507055
	IRLO-AS-AST2-2	FAUNA	7/16/2011	0.03	0.03	0.128	0.128	U	51.745666	-176.507055
	IRLO-AS-AST2-3	FAUNA	7/16/2011	0.03	0.03	0.152	0.152	U	51.745666	-176.507055
	IRLO-AS-AST3-1	FAUNA	7/14/2011	0.02	0.02	0.09	0.09	U	51.688333	-176.63375
	IRLO-AS-AST3-2	FAUNA	7/14/2011	0.02	0.02	0.085	0.085	U	51.688333	-176.63375
	IRLO-AS-AST3-3	FAUNA	7/14/2011	0.02	0.02	0.091	0.091	U	51.688333	-176.63375
Pacific Cod - whole	PCOD-AS-AS2M-1	FAUNA	7/15/2011	0.003	0.003	0.015	0.015	U	51.737472	-176.48025

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockfish - whole	ROCK-AS-AST1-1	FAUNA	7/15/2011	0.03	0.03	0.108	0.108	U	51.737472	-176.48025
	ROCK-AS-AST1-2	FAUNA	7/15/2011	0.02	0.02	0.075	0.075	U	51.737472	-176.48025
	ROCK-AS-AST1-3	FAUNA	7/15/2011	0.01	0.01	0.043	0.043	U	51.737472	-176.48025
	ROCK-AS-AST2-1	FAUNA	7/16/2011	0.02	0.02	0.077	0.077	U	51.745666	-176.507055
	ROCK-AS-AST2-2	FAUNA	7/16/2011	0.01	0.01	0.037	0.037	U	51.745666	-176.507055
	ROCK-AS-AST2-3	FAUNA	7/16/2011	0.02	0.02	0.077	0.077	U	51.745666	-176.507055
	ROCK-AS-AST3-1	FAUNA	7/14/2011	0.02	0.02	0.082	0.082	U	51.688333	-176.63375
	ROCK-AS-AST3-2	FAUNA	7/14/2011	0.03	0.03	0.127	0.127	U	51.688333	-176.63375
	ROCK-AS-AST3-3	FAUNA	7/14/2011	0.01	0.01	0.043	0.043	U	51.688333	-176.63375
	ROCK-AS-DUP	FAUNA	7/14/2011	0.01	0.01	0.039	0.039	U	51.688333	-176.63375
Sea Urchin - whole	URCH-AS-AST1-1	FAUNA	7/15/2011	0.03	0.03	0.114	0.114	U	51.737472	-176.48025
	URCH-AS-AST2-1	FAUNA	7/16/2011	0.04	0.04	0.161	0.161	U	51.745666	-176.507055
	URCH-AS-AST3-1	FAUNA	7/14/2011	0.03	0.03	0.112	0.112	U	51.688333	-176.63375

Qualifier definitions:
U - Analytical result below detection limit
J - Estimated

Appendix J

Activity Concentration of Uranium Isotopes

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Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
^{234}Uranium (pCi/kg)										
Amchitka Site (AMC01)										
Dolly Varden - whole	DOLL-AI-XXX-1	FAUNA	6/24/2011	1.3 ± 1.2	1	5.01 ± 4.625	3.854	U	51.468283	179.108052
Goose Egg - no shell	GOOS-AI-XXX-1	FAUNA	6/24/2011	0.7 ± 0.8	2	1.859 ± 2.125	5.312	UJ	51.491305	179.0595
Glaucous-winged Gull Egg - no shell	GWGU-AI-XXX-1	FAUNA	6/24/2011	0.6 ± 0.2	1	2.079 ± 0.693	3.466	J	51.456388	179.167
Amchitka Site (Long Shot) (AMC02)										
Chiton	CHIT-LS-LT1-1	FAUNA	7/4/2011	5 ± 1	1	24.801 ± 4.96	4.96		51.457555	179.195138
	CHIT-LS-LT2-1	FAUNA	7/3/2011	27 ± 2.7	1	126.477 ± 12.648	4.684		51.44925	179.205583
	CHIT-LS-LT3-1	FAUNA	7/3/2011	19.6 ± 3.9	1	93.324 ± 18.57	4.761		51.43	179.22667
Dragon Kelp	EUAL-LS-DUP	VEG	7/3/2011	25.6 ± 2.4	1	153.746 ± 14.414	6.006		51.44925	179.205583
	EUAL-LS-LT1-1	VEG	7/4/2011	15.7 ± 2.9	1	146.698 ± 27.097	9.344		51.457555	179.195138
	EUAL-LS-LT1-2	VEG	7/4/2011	31.3 ± 1.2	1	194.58 ± 7.46	6.217		51.457555	179.195138
	EUAL-LS-LT1-3	VEG	7/4/2011	30.3 ± 2.2	1	182.931 ± 13.282	6.037		51.457555	179.195138
	EUAL-LS-LT2-1	VEG	7/3/2011	28 ± 2	1	169.37 ± 12.098	6.049		51.44925	179.205583
	EUAL-LS-LT2-2	VEG	7/3/2011	12.4 ± 1.8	1	90.027 ± 13.068	7.26		51.44925	179.205583
	EUAL-LS-LT2-3	VEG	7/3/2011	17.6 ± 2.7	1	127.31 ± 19.53	7.234		51.44925	179.205583
	EUAL-LS-LT3-1	VEG	7/2/2011	34.5 ± 2.5	1	220.189 ± 15.956	6.382		51.43	179.22667
	EUAL-LS-LT3-2	VEG	7/2/2011	44.6 ± 5.3	1	317.361 ± 37.713	7.116		51.43	179.22667
	EUAL-LS-LT3-3	VEG	7/2/2011	12.5 ± 2.5	1	105.437 ± 21.087	8.435		51.43	179.22667
Rockweed	FUCU-LS-DUP	VEG	6/22/2011	67.4 ± 3.1	1	370.394 ± 17.036	5.495		51.447472	179.190888
	FUCU-LS-LT1-1	VEG	6/22/2011	88.5 ± 2.9	1	478.094 ± 15.666	5.402		51.447527	179.189361
	FUCU-LS-LT1-2	VEG	6/22/2011	75.7 ± 4.5	1	463.077 ± 27.528	6.117		51.447527	179.189361
	FUCU-LS-LT1-3	VEG	6/22/2011	61.2 ± 3.9	1	406.922 ± 25.931	6.649		51.448777	179.189305
	FUCU-LS-LT2-1	VEG	6/22/2011	35 ± 1.2	1	275.964 ± 9.462	7.885		51.447222	179.199361
	FUCU-LS-LT2-2	VEG	6/22/2011	56 ± 2.4	1	405.905 ± 17.396	7.248		51.44625	179.196972
	FUCU-LS-LT2-3	VEG	6/22/2011	73.5 ± 2.9	1	449.502 ± 17.735	6.116		51.446722	179.191888
	FUCU-LS-LT3-1	VEG	7/2/2011	89.1 ± 3.5	1	431.578 ± 16.953	4.844		51.433611	179.219305
	FUCU-LS-LT3-2	VEG	7/2/2011	68.1 ± 3.7	1	309.893 ± 16.837	4.551		51.430166	179.218694
	FUCU-LS-LT3-3	VEG	7/2/2011	95.7 ± 4.9	1	350.681 ± 17.955	3.664		51.430166	179.218694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-LS-DUP	FAUNA	7/12/2011	9.1 ± 2	1	44.188 ± 9.712	4.856		51.434527	179.234416
	GREN-LS-LT1-1	FAUNA	7/4/2011	3.9 ± 1.4	1	18.383 ± 6.599	4.714		51.457555	179.195138
	GREN-LS-LT1-2	FAUNA	7/4/2011	2.5 ± 0.8	1	11.834 ± 3.787	4.734	J	51.457555	179.195138
	GREN-LS-LT1-3	FAUNA	7/5/2011	4.3 ± 4.9	1	20.138 ± 22.948	4.683	U	51.457555	179.195138
	GREN-LS-LT2-1	FAUNA	7/3/2011	7.8 ± 1.4	1	37.69 ± 6.765	4.832		51.432194	179.230277
	GREN-LS-LT2-2	FAUNA	7/3/2011	4.7 ± 1.2	1	21.676 ± 5.534	4.612		51.432194	179.230277
	GREN-LS-LT2-3	FAUNA	7/3/2011	6.8 ± 1.8	1	32.356 ± 8.565	4.758		51.432194	179.230277
	GREN-LS-LT3-1	FAUNA	7/3/2011	5.4 ± 1.8	1	23.97 ± 7.99	4.439		51.43	179.22667
	GREN-LS-LT3-2	FAUNA	7/12/2011	7 ± 2.5	1	34.341 ± 12.264	4.906		51.434527	179.234416
	GREN-LS-LT3-3	FAUNA	7/12/2011	6.3 ± 1	1	30.462 ± 4.835	4.835		51.434527	179.234416
Halibut - whole	HALI-LS-L2M-1	FAUNA	7/13/2011	0.05 ± 0.08	0.6	0.192 ± 0.307	2.304	U	51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-LS-LT1-1	FAUNA	7/5/2011	80.8 ± 6.1	1	346.144 ± 26.132	4.284		51.457555	179.195138
	HMUS-LS-LT2-1	FAUNA	7/4/2011	37.9 ± 2.4	1	154.833 ± 9.805	4.085		51.44925	179.205583
	HMUS-LS-LT3-1	FAUNA	7/3/2011	28	28	58.721	58.721	U	51.44925	179.205583
Irish Lord - whole	IRLO-LS-LT1-1	FAUNA	7/4/2011	3 ± 1.2	1	14.148 ± 5.659	4.716		51.457555	179.195138
	IRLO-LS-LT1-2	FAUNA	7/4/2011	3.2 ± 2.4	1	15.139 ± 11.354	4.731	U	51.457555	179.195138
	IRLO-LS-LT1-3	FAUNA	7/5/2011	5.3 ± 1.6	1	28.104 ± 8.484	5.303		51.457555	179.195138
	IRLO-LS-LT2-1	FAUNA	7/3/2011	12.1 ± 2.5	1	52.368 ± 10.82	4.328		51.432194	179.230277
	IRLO-LS-LT2-2	FAUNA	7/3/2011	11.1 ± 2.4	1	45.988 ± 9.943	4.143		51.432194	179.230277
	IRLO-LS-LT2-3	FAUNA	7/3/2011	19.3 ± 3.7	2	85.497 ± 16.391	8.86		51.432194	179.230277
	IRLO-LS-LT3-1	FAUNA	7/2/2011	9 ± 2.4	1	40.142 ± 10.705	4.46		51.43	179.22667
	IRLO-LS-LT3-2	FAUNA	7/12/2011	8.2 ± 1	1	38.903 ± 4.744	4.744		51.434944	179.2315
	IRLO-LS-LT3-3	FAUNA	7/12/2011	7.2 ± 1.2	1	39.78 ± 6.63	5.525		51.434944	179.2315
Octopus	OCTP-LS-L2M-1	FAUNA	7/3/2011	21.8 ± 1.6	1	155.372 ± 11.403	7.127		51.44925	179.205583
Pacific Cod - whole	PCOD-LS-L2M-1	FAUNA	7/4/2011	2.5 ± 1.4	1	12.44 ± 6.967	4.976	J	51.451805	179.196972
Rockfish - whole	ROCK-LS-DUP	FAUNA	7/12/2011	5.8 ± 1.8	1	22.618 ± 7.019	3.9		51.434944	179.2315
	ROCK-LS-DUP2	FAUNA	7/12/2011	15.2 ± 2.4	1	65.045 ± 10.27	4.279		51.465472	179.206722
	ROCK-LS-LT1-1	FAUNA	7/4/2011	12 ± 6	1	55.725 ± 27.863	4.644		51.457555	179.195138
	ROCK-LS-LT1-2	FAUNA	7/12/2011	6.7 ± 1.4	1	27.676 ± 5.783	4.131		51.465472	179.206722
	ROCK-LS-LT1-3	FAUNA	7/12/2011	4.7 ± 1.2	1	19.398 ± 4.953	4.127		51.465472	179.206722
	ROCK-LS-LT2-1	FAUNA	7/4/2011	14.5 ± 2.2	1	58.155 ± 8.824	4.011		51.44925	179.205583
	ROCK-LS-LT2-2	FAUNA	7/12/2011	13.9 ± 2	1	54.854 ± 7.893	3.946		51.44625	179.223416
	ROCK-LS-LT3-1	FAUNA	7/12/2011	17.2 ± 2.4	1	75.7 ± 10.563	4.401		51.434944	179.2315
	ROCK-LS-LT3-2	FAUNA	7/12/2011	10.4 ± 1.2	1	44.12 ± 5.091	4.242		51.434944	179.2315
	ROCK-LS-LT3-3	FAUNA	7/3/2011	10 ± 2.7	1	34.502 ± 9.316	3.45		51.43	179.22667

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-LT1-2	VEG	6/22/2011	3.3 ± 0.6	1	10.005 ± 1.819	3.032		51.447361	179.189111
Sea Urchin - whole	URCH-LS-LT1-1	FAUNA	7/4/2011	25 ± 7.3	1	97.661 ± 28.517	3.906		51.457555	179.195138
	URCH-LS-LT2-1	FAUNA	7/3/2011	23.8 ± 7.8	1	91.442 ± 29.968	3.842		51.44925	179.205583
	URCH-LS-LT3-1	FAUNA	7/2/2011	26.3 ± 5.1	1	102.444 ± 19.866	3.895		51.43	179.22667
Amchitka Site (Milrow) (AMC03)										
Chiton	CHIT-ML-MT1-1	FAUNA	7/9/2011	18.7 ± 7.3	1	70.516 ± 27.528	3.771		51.408472	179.139166
	CHIT-ML-MT2-1	FAUNA	7/10/2011	28.9 ± 6.1	1	134.189 ± 28.324	4.643		51.389416	179.173138
	CHIT-ML-MT3-1	FAUNA	7/10/2011	27.9 ± 4.1	1	126.603 ± 18.605	4.538		51.387805	179.184
Dragon Kelp	EUAL-ML-DUP	VEG	7/9/2011	17 ± 2.4	1	128.107 ± 18.086	7.536		51.408472	179.139166
	EUAL-ML-MT1-1	VEG	7/9/2011	18.2 ± 1.4	1	145.492 ± 11.192	7.994		51.408472	179.139166
	EUAL-ML-MT1-2	VEG	7/9/2011	23.2 ± 2.9	1	172.629 ± 21.579	7.441		51.408472	179.139166
	EUAL-ML-MT1-3	VEG	7/9/2011	14.8 ± 1.8	1	124.491 ± 15.141	8.412		51.408472	179.139166
	EUAL-ML-MT2-1	VEG	7/10/2011	41.9 ± 4.7	2	312.28 ± 35.029	14.906		51.389416	179.173138
	EUAL-ML-MT2-2	VEG	7/10/2011	26.8 ± 3.5	1	189.883 ± 24.798	7.085		51.389416	179.173138
	EUAL-ML-MT2-3	VEG	7/10/2011	21.9 ± 1.2	1	165.077 ± 9.045	7.538		51.389416	179.173138
	EUAL-ML-MT3-1	VEG	7/10/2011	21 ± 3.5	1	147.717 ± 24.62	7.034		51.387805	179.184
	EUAL-ML-MT3-2	VEG	7/10/2011	21.5 ± 2.5	1	157.076 ± 18.265	7.306		51.387805	179.184
	EUAL-ML-MT3-3	VEG	7/10/2011	38.2 ± 4.1	1	263.434 ± 28.274	6.896		51.387805	179.184
Rockweed	FUCU-ML-DUP	VEG	6/20/2011	103 ± 4	1	446.93 ± 17.356	4.339		51.412449	179.160843
	FUCU-ML-MT1-1	VEG	6/20/2011	96.7 ± 3.5	1	402.858 ± 14.581	4.166		51.412449	179.160843
	FUCU-ML-MT1-2	VEG	6/21/2011	89.1 ± 1.4	1	540.504 ± 8.493	6.066		51.417083	179.134083
	FUCU-ML-MT1-3	VEG	7/9/2011	108 ± 6	1	496.426 ± 27.579	4.597		51.417083	179.134083
	FUCU-ML-MT2-1	VEG	6/20/2011	91.6 ± 4.3	1	472.733 ± 22.192	5.161		51.403305	179.167166
	FUCU-ML-MT2-2	VEG	6/21/2011	55 ± 2.2	1	386.405 ± 15.456	7.026		51.405694	179.161361
	FUCU-ML-MT2-3	VEG	6/21/2011	53 ± 3.1	1	368.012 ± 21.525	6.944		51.405694	179.161361
	FUCU-ML-MT3-1	VEG	7/10/2011	133 ± 4	1	645.882 ± 19.425	4.856		51.389416	179.173138
	FUCU-ML-MT3-2	VEG	7/10/2011	144 ± 4	1	691.579 ± 19.211	4.803		51.389416	179.173138
	FUCU-ML-MT3-3	VEG	7/10/2011	130 ± 6	1	656.317 ± 30.292	5.049		51.389416	179.173138

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-ML-DUP	FAUNA	7/10/2011	5.7 ± 0.8	1	27.64 ± 3.879	4.849		51.387805	179.184
	GREN-ML-MT1-1	FAUNA	7/9/2011	6 ± 1.4	1	26.135 ± 6.098	4.356		51.408472	179.139166
	GREN-ML-MT1-2	FAUNA	7/9/2011	7.7 ± 1.6	1	35.652 ± 7.408	4.63		51.408472	179.139166
	GREN-ML-MT1-3	FAUNA	7/9/2011	10.5 ± 1.4	1	50.7 ± 6.76	4.829		51.408472	179.139166
	GREN-ML-MT2-1	FAUNA	7/11/2011	3.4 ± 1.8	1	15.849 ± 8.391	4.662		51.396944	179.1435
	GREN-ML-MT2-2	FAUNA	7/11/2011	5.5 ± 1	1	25.747 ± 4.681	4.681		51.396944	179.1435
	GREN-ML-MT2-3	FAUNA	7/11/2011	4.1 ± 1.2	1	19.577 ± 5.73	4.775		51.396944	179.1435
	GREN-ML-MT3-1	FAUNA	7/10/2011	11.4 ± 3.5	1	55.287 ± 16.974	4.85		51.387805	179.184
	GREN-ML-MT3-2	FAUNA	7/10/2011	3.2 ± 1.8	1	15.439 ± 8.685	4.825		51.387805	179.184
	GREN-ML-MT3-3	FAUNA	7/10/2011	5.7 ± 1	1	27.006 ± 4.738	4.738		51.387805	179.184
Halibut - whole	HALI-ML-M2M-1	FAUNA	7/11/2011	1.6 ± 1.8	1	5.559 ± 6.254	3.474	U	51.365055	179.111472
Horse Mussel - soft tissue only	HMUS-ML-MT1-1	FAUNA	7/9/2011	70.4 ± 4.1	1	320.134 ± 18.644	4.547		51.408472	179.139166
	HMUS-ML-MT2-1	FAUNA	7/11/2011	40.1 ± 1.6	1	180.349 ± 7.196	4.497		51.389416	179.173138
	HMUS-ML-MT3-1	FAUNA	7/10/2011	46.3 ± 2.4	1	212.543 ± 11.017	4.591		51.387805	179.184
Irish Lord - whole	IRLO-ML-MT1-1	FAUNA	7/9/2011	5.8 ± 2.2	1	24.761 ± 9.392	4.269		51.408472	179.139166
	IRLO-ML-MT1-2	FAUNA	7/9/2011	3.8 ± 1.4	1	18.023 ± 6.64	4.743		51.408472	179.139166
	IRLO-ML-MT1-3	FAUNA	7/9/2011	3.8 ± 3.1	1	17.801 ± 14.522	4.685	U	51.408472	179.139166
	IRLO-ML-MT2-1	FAUNA	7/10/2011	7.5 ± 2.9	1	32.318 ± 12.496	4.309		51.389416	179.173138
	IRLO-ML-MT2-2	FAUNA	7/11/2011	3.7 ± 2	2	15.941 ± 8.617	8.617	J	51.396944	179.1435
	IRLO-ML-MT2-3	FAUNA	7/11/2011	4.7 ± 1.8	1	22.295 ± 8.538	4.744		51.396944	179.1435
	IRLO-ML-MT3-1	FAUNA	7/10/2011	10.2 ± 1.2	1	57.501 ± 6.765	5.637		51.387805	179.184
	IRLO-ML-MT3-2	FAUNA	7/10/2011	6.1 ± 1.4	1	29.451 ± 6.759	4.828		51.387805	179.184
	IRLO-ML-MT3-3	FAUNA	7/10/2011	8.2 ± 1.6	1	45.968 ± 8.969	5.606		51.387805	179.184
Octopus	OCTP-ML-M2M-1	FAUNA	7/10/2011	10.6 ± 0.4	0.5	49.991 ± 1.886	2.358		51.389416	179.173138
Pacific Cod - whole	PCOD-ML-M2M-1	FAUNA	7/10/2011	3 ± 1.4	1	15.864 ± 7.403	5.288		51.408472	179.139166
Rockfish - whole	ROCK-ML-DUP	FAUNA	7/9/2011	19.5 ± 2	1	86.206 ± 8.842	4.421		51.408472	179.139166
	ROCK-ML-MT1-1	FAUNA	7/9/2011	7.5 ± 1.6	1	33.014 ± 7.043	4.402		51.408472	179.139166
	ROCK-ML-MT1-2	FAUNA	7/9/2011	15.7 ± 2.9	1	68.913 ± 12.729	4.389		51.408472	179.139166
	ROCK-ML-MT1-3	FAUNA	7/9/2011	10.2 ± 2	1	43.177 ± 8.466	4.233		51.408472	179.139166
	ROCK-ML-MT2-1	FAUNA	7/11/2011	8.8 ± 1.6	1	33.028 ± 6.005	3.753		51.365055	179.111472
	ROCK-ML-MT2-2	FAUNA	7/11/2011	16.9 ± 1.8	1	68.385 ± 7.284	4.046		51.365055	179.111472
	ROCK-ML-MT2-3	FAUNA	7/11/2011	15 ± 2.5	1	67.577 ± 11.263	4.505		51.365055	179.111472
	ROCK-ML-MT3-1	FAUNA	7/10/2011	13.9 ± 1.8	1	65.594 ± 8.494	4.719		51.387805	179.184
	ROCK-ML-MT3-2	FAUNA	7/10/2011	5.3 ± 2.7	1	19.073 ± 9.716	3.599		51.387805	179.184
	ROCK-ML-MT3-3	FAUNA	7/10/2011	2.6 ± 2.4	2	6.05 ± 5.585	4.654	U	51.387805	179.184

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-ML-1	VEG	6/21/2011	3.2 ± 0.4	1	11.452 ± 1.432	3.579		51.402583	179.183972
Sea Urchin - whole	URCH-ML-MT1-1	FAUNA	7/9/2011	26.4 ± 7.8	1	97.937 ± 28.936	3.71		51.408472	179.139166
	URCH-ML-MT2-1	FAUNA	7/10/2011	24.7 ± 5.1	1	92.247 ± 19.047	3.735		51.389416	179.173138
	URCH-ML-MT3-1	FAUNA	7/10/2011	24.2 ± 7.1	1	96.071 ± 28.186	3.97		51.387805	179.184
Amchitka Site (Cannikin) (AMC05)										
Chiton	CHIT-CN-CT1-1	FAUNA	7/8/2011	31.6 ± 3.7	1	147.999 ± 17.329	4.684		51.482972	179.123833
	CHIT-CN-CT2-1	FAUNA	7/7/2011	32.4 ± 6.1	1	153.332 ± 28.868	4.732		51.472611	179.151111
	CHIT-CN-CT3-1	FAUNA	7/5/2011	24.5 ± 2.9	1	120.255 ± 14.234	4.908		51.471416	179.172861
Dragon Kelp	EUAL-CN-CT1-1	VEG	7/8/2011	23.3 ± 2.5	1	172.471 ± 18.505	7.402		51.482972	179.123833
	EUAL-CN-CT1-2	VEG	7/8/2011	19.1 ± 1	1	124.527 ± 6.52	6.52		51.482972	179.123833
	EUAL-CN-CT1-3	VEG	7/8/2011	28 ± 2.2	1	171.504 ± 13.475	6.125		51.482972	179.123833
	EUAL-CN-CT2-1	VEG	7/6/2011	23.7 ± 1.6	1	151.156 ± 10.205	6.378		51.472611	179.151111
	EUAL-CN-CT2-2	VEG	7/6/2011	39.8 ± 3.7	1	249.804 ± 23.223	6.276		51.472611	179.151111
	EUAL-CN-CT2-3	VEG	7/7/2011	17.8 ± 1.2	1	129.05 ± 8.7	7.25		51.472611	179.151111
	EUAL-CN-CT3-1	VEG	7/5/2011	20.1 ± 2	1	140.157 ± 13.946	6.973		51.471416	179.172861
	EUAL-CN-CT3-2	VEG	7/5/2011	13.5 ± 2	1	97.061 ± 14.379	7.19		51.471416	179.172861
	EUAL-CN-CT3-3	VEG	7/5/2011	25.1 ± 2.7	1	163.136 ± 17.548	6.499		51.471416	179.172861
	EUAL-CN-DUP	VEG	7/6/2011	9.1 ± 1.8	1	60.466 ± 11.96	6.645		51.471416	179.172861
Rockweed	FUCU-CN-CT1-1	VEG	6/23/2011	53.8 ± 2.5	1	310.26 ± 14.417	5.767		51.481888	179.118138
	FUCU-CN-CT1-2	VEG	6/23/2011	59.8 ± 3.7	1	376.624 ± 23.303	6.298		51.481888	179.118138
	FUCU-CN-CT1-3	VEG	6/23/2011	69.5 ± 2.9	1	409.713 ± 17.096	5.895		51.481888	179.118138
	FUCU-CN-CT2-1	VEG	7/8/2011	127 ± 4	1	524.824 ± 16.53	4.132		51.476638	179.135277
	FUCU-CN-CT2-2	VEG	7/8/2011	124 ± 6	1	550.213 ± 26.623	4.437		51.476638	179.135277
	FUCU-CN-CT2-3	VEG	7/12/2011	55.3 ± 3.5	1	292.316 ± 18.501	5.286		51.467583	179.153583
	FUCU-CN-CT3-1	VEG	7/6/2011	51.2 ± 3.9	1	275.897 ± 21.016	5.389		51.465027	179.173166
	FUCU-CN-CT3-2	VEG	7/6/2011	41.2 ± 6.3	1	241.828 ± 36.979	5.87		51.465472	179.170583
	FUCU-CN-CT3-3	VEG	7/6/2011	77.6 ± 3.1	1	492.451 ± 19.673	6.346		51.464638	179.159305
	FUCU-CN-DUP	VEG	6/23/2011	53.1 ± 2.2	1	342.587 ± 14.194	6.452		51.481888	179.118138

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-CN-CT1-1	FAUNA	7/8/2011	8.5 ± 2.2	1	40.975 ± 10.605	4.821		51.482972	179.123833
	GREN-CN-CT1-2	FAUNA	7/8/2011	7.2 ± 1.6	1	34.195 ± 7.599	4.749		51.482972	179.123833
	GREN-CN-CT1-3	FAUNA	7/8/2011	6.8 ± 2	1	30.987 ± 9.114	4.557		51.482972	179.123833
	GREN-CN-CT2-1	FAUNA	7/7/2011	8 ± 2	1	38.992 ± 9.748	4.874		51.472611	179.151111
	GREN-CN-CT2-2	FAUNA	7/7/2011	4.1 ± 2	1	18.812 ± 9.177	4.588		51.472611	179.151111
	GREN-CN-CT2-3	FAUNA	7/7/2011	5.2 ± 0.8	1	23.996 ± 3.692	4.615		51.472611	179.151111
	GREN-CN-CT3-1	FAUNA	7/5/2011	6.5 ± 1.6	1	29.623 ± 7.292	4.557		51.471416	179.172861
	GREN-CN-CT3-2	FAUNA	7/5/2011	8.9 ± 1	1	38.767 ± 4.356	4.356		51.471416	179.172861
	GREN-CN-CT3-3	FAUNA	7/5/2011	4.8 ± 1.6	1	22.041 ± 7.347	4.592		51.471416	179.172861
	GREN-CN-DUP	FAUNA	7/8/2011	5.3 ± 1.6	1	25.56 ± 7.716	4.823		51.482972	179.123833
Halibut - whole	HALI-CN-C2M-1	FAUNA	7/13/2011	0.6 ± 0.2	1	2.322 ± 0.774	3.87	J	51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-CN-CT1-1	FAUNA	7/8/2011	23.4 ± 2.4	1	96.198 ± 9.866	4.111		51.482972	179.123833
	HMUS-CN-CT2-1	FAUNA	7/7/2011	66.1 ± 3.7	1	299.527 ± 16.766	4.531		51.472611	179.151111
	HMUS-CN-CT3-1	FAUNA	7/5/2011	52.9 ± 4.1	1	217.004 ± 16.819	4.102		51.471416	179.172861
Irish Lord - whole	IRLO-CN-CT1-1	FAUNA	7/8/2011	5.9 ± 2	1	26.589 ± 9.013	4.507		51.482972	179.123833
	IRLO-CN-CT1-2	FAUNA	7/8/2011	13.3 ± 1.8	1	66.662 ± 9.022	5.012		51.482972	179.123833
	IRLO-CN-CT1-3	FAUNA	7/8/2011	9.4 ± 2.2	1	44.157 ± 10.335	4.698		51.482972	179.123833
	IRLO-CN-CT2-1	FAUNA	7/7/2011	8.1 ± 2	1	38.172 ± 9.425	4.713		51.472611	179.151111
	IRLO-CN-CT2-2	FAUNA	7/7/2011	12.3 ± 3.7	1	56.197 ± 16.905	4.569		51.472611	179.151111
	IRLO-CN-CT2-3	FAUNA	7/7/2011	5.4 ± 0.8	1	26.579 ± 3.938	4.922		51.472611	179.151111
	IRLO-CN-CT3-1	FAUNA	7/5/2011	7.3 ± 2.7	1	37.612 ± 13.911	5.152		51.471416	179.172861
	IRLO-CN-CT3-2	FAUNA	7/5/2011	5.2 ± 1.2	1	25.211 ± 5.818	4.848		51.471416	179.172861
	IRLO-CN-CT3-3	FAUNA	7/5/2011	4 ± 1.8	1	19.177 ± 8.63	4.794		51.471416	179.172861
Octopus	OCTP-CN-C2M-1	FAUNA	7/8/2011	11.3 ± 0.8	1	55.38 ± 3.921	4.901		51.482972	179.123833
Pacific Cod - whole	PCOD-CN-C2M-1	FAUNA	7/6/2011	1 ± 1.2	1	4.579 ± 5.494	4.579	U	51.483527	179.187583
Rockfish - whole	ROCK-CN-CT1-1	FAUNA	7/8/2011	2.3 ± 1	1	9.087 ± 3.951	3.951	J	51.482972	179.123833
	ROCK-CN-CT1-2	FAUNA	7/8/2011	4.8 ± 1.2	1	18.512 ± 4.628	3.857		51.482972	179.123833
	ROCK-CN-CT1-3	FAUNA	7/8/2011	11.1 ± 1.6	1	44.604 ± 6.429	4.018		51.482972	179.123833
	ROCK-CN-CT2-1	FAUNA	7/6/2011	4.2 ± 1.4	1	14.833 ± 4.944	3.532		51.472611	179.151111
	ROCK-CN-CT2-2	FAUNA	7/6/2011	7.7 ± 1.6	1	28.189 ± 5.857	3.661		51.472611	179.151111
	ROCK-CN-CT2-3	FAUNA	7/6/2011	6.7 ± 2	1	27.407 ± 8.181	4.091		51.472611	179.151111
	ROCK-CN-CT3-1	FAUNA	7/6/2011	7.2 ± 2.2	1	30.749 ± 9.395	4.271		51.471416	179.172861
	ROCK-CN-CT3-2	FAUNA	7/6/2011	7.6 ± 2	1	29.202 ± 7.685	3.842		51.471416	179.172861
	ROCK-CN-CT3-3	FAUNA	7/6/2011	9.5 ± 2.2	1	39.704 ± 9.195	4.179		51.471416	179.172861
	ROCK-CN-DUP	FAUNA	7/6/2011	5.6 ± 1.4	1	22.492 ± 5.623	4.016		51.471416	179.172861

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Reindeer Lichen	STRL-AI-CT1-1	VEG	6/23/2011	10.8 ± 3.5	2	17.121 ± 5.548	3.171		51.480583	179.109472
Sea Urchin - whole	URCH-CN-CT1-1	FAUNA	7/8/2011	24.6 ± 6.9	1	98.702 ± 27.685	4.012		51.482972	179.123833
	URCH-CN-CT2-1	FAUNA	7/7/2011	17.7 ± 8.6	2	60.652 ± 29.469	6.853		51.472611	179.151111
	URCH-CN-CT3-1	FAUNA	7/5/2011	16.7 ± 5.1	1	63.969 ± 19.535	3.83		51.471416	179.172861
Amchitka Site (Adak Island) (AMC13)										
Dolly Varden - whole	DOLL-AD-XXX-1	FAUNA	6/28/2011	0.9 ± 0.4	1	3.671 ± 1.631	4.079	J	51.8375	-176.672555
Reindeer Lichen	STRL-AD-XXX-1	VEG	6/28/2011	4.6 ± 1	1	9.004 ± 1.957	1.957		51.837527	-176.670694
	STRL-AD-XXX-2	VEG	6/29/2011	3.7 ± 0.8	1	9.142 ± 1.977	2.471		51.872833	-176.707444
	STRL-AD-XXX-3	VEG	6/29/2011	6 ± 1.4	1	9.532 ± 2.224	1.589		51.900805	-176.688527
Amchitka Site (Adak Island North) (AMC14)										
Chiton	CHIT-AN-ANT1-1	FAUNA	7/20/2011	13.5 ± 3.7	1	65.749 ± 18.02	4.87		51.838722	-176.582805
	CHIT-AN-ANT2-1	FAUNA	7/18/2011	9.4 ± 3.7	1	47.116 ± 18.546	5.012		51.848361	-176.506277
	CHIT-AN-ANT3-1	FAUNA	7/17/2011	9.9 ± 3.5	1	50.343 ± 17.798	5.085		51.853722	-176.470694
Dragon Kelp	EUAL-AN-ANT1-1	VEG	7/19/2011	15.7 ± 1.4	1	131.646 ± 11.739	8.385		51.835694	-176.542138
	EUAL-AN-ANT1-2	VEG	7/19/2011	18.2 ± 2.7	1	124.065 ± 18.405	6.817		51.835694	-176.542138
	EUAL-AN-ANT1-3	VEG	7/19/2011	15.6 ± 1.2	1	120.575 ± 9.275	7.729		51.835694	-176.542138
	EUAL-AN-ANT2-1	VEG	7/18/2011	27.8 ± 2.7	1	202.652 ± 19.682	7.29		51.848361	-176.506277
	EUAL-AN-ANT2-2	VEG	7/18/2011	33.7 ± 2	1	214.752 ± 12.745	6.372		51.848361	-176.506277
	EUAL-AN-ANT2-3	VEG	7/18/2011	21.8 ± 1.8	1	151.42 ± 12.503	6.946		51.848361	-176.506277
	EUAL-AN-ANT3-1	VEG	7/17/2011	7.3 ± 1	0.4	54.561 ± 7.474	2.99		51.853722	-176.470694
	EUAL-AN-ANT3-2	VEG	7/17/2011	27.9 ± 1	1	190.255 ± 6.819	6.819		51.853722	-176.470694
	EUAL-AN-ANT3-3	VEG	7/17/2011	17.8 ± 3.1	1	119.448 ± 20.803	6.711		51.853722	-176.470694
	EUAL-AN-DUP	VEG	7/17/2011	46.8 ± 3.9	1	294.27 ± 24.523	6.288		51.853722	-176.470694
Rockweed	FUCU-AN-ANT1-1	VEG	7/19/2011	83.9 ± 3.7	1	427.464 ± 18.851	5.095		51.841444	-176.546083
	FUCU-AN-ANT1-2	VEG	7/20/2011	48.9 ± 2.7	1	315.462 ± 17.418	6.451		51.8395	-176.591305
	FUCU-AN-ANT1-3	VEG	7/20/2011	75.7 ± 3.7	1	413.124 ± 20.192	5.457		51.8395	-176.591305
	FUCU-AN-ANT2-1	VEG	7/18/2011	78.6 ± 4.3	1	496.375 ± 27.155	6.315		51.837666	-176.517527
	FUCU-AN-ANT2-2	VEG	7/18/2011	46.1 ± 2.7	1	245.055 ± 14.352	5.316		51.841444	-176.546083
	FUCU-AN-ANT2-3	VEG	7/18/2011	113 ± 4	1	476.681 ± 16.874	4.218		51.8395	-176.591305
	FUCU-AN-ANT3-1	VEG	7/18/2011	62 ± 3.3	1	354.728 ± 18.881	5.721		51.839944	-176.515916
	FUCU-AN-ANT3-2	VEG	7/18/2011	87.9 ± 4.1	1	429.686 ± 20.042	4.888		51.828972	-176.448305
	FUCU-AN-ANT3-3	VEG	7/18/2011	84.2 ± 3.5	1	418.621 ± 17.401	4.972		51.830833	-176.456361
	FUCU-AN-DUP	VEG	7/18/2011	144 ± 8	1	670.078 ± 37.227	4.653		51.828972	-176.448305

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-AN-ANT1-1	FAUNA	7/19/2011	4.9 ± 2.2	1	21.751 ± 9.766	4.439		51.835694	-176.542138
	GREN-AN-ANT1-2	FAUNA	7/19/2011	2.7 ± 1.4	1	11.277 ± 5.847	4.177	J	51.835694	-176.542138
	GREN-AN-ANT1-3	FAUNA	7/19/2011	8.1 ± 1.2	1	29.501 ± 4.371	3.642		51.835694	-176.542138
	GREN-AN-ANT2-1	FAUNA	7/18/2011	10.7 ± 2.5	1	49.503 ± 11.566	4.626		51.848361	-176.506277
	GREN-AN-ANT2-2	FAUNA	7/18/2011	5.4 ± 0.8	1	25.028 ± 3.708	4.635		51.848361	-176.506277
	GREN-AN-ANT2-3	FAUNA	7/18/2011	5.3 ± 1.2	1	25.132 ± 5.69	4.742		51.848361	-176.506277
	GREN-AN-ANT3-1	FAUNA	7/17/2011	5 ± 1.2	1	22.821 ± 5.477	4.564		51.853722	-176.470694
	GREN-AN-ANT3-2	FAUNA	7/17/2011	2.4 ± 1.6	1	11.145 ± 7.43	4.644	J	51.853722	-176.470694
	GREN-AN-ANT3-3	FAUNA	7/17/2011	4.8 ± 1.2	1	22.336 ± 5.584	4.653		51.853722	-176.470694
	GREN-AN-DUP	FAUNA	7/17/2011	3.6 ± 2.2	1	17.147 ± 10.479	4.763		51.853722	-176.470694
Halibut - whole	HALI-AN-AN2M-1	FAUNA	7/17/2011	1.2 ± 1.4	1	4.006 ± 4.674	3.339	U	51.853722	-176.470694
	HALI-AN-DUP	FAUNA	7/17/2011	1.6 ± 1	1	5.303 ± 3.314	3.314	J	51.853722	-176.470694
Horse Mussel - soft tissue only	HMUS-AN-ANT1-1	FAUNA	7/20/2011	23.5 ± 2	1	128.485 ± 10.935	5.467		51.838722	-176.582805
	HMUS-AN-ANT2-1	FAUNA	7/18/2011	49.8 ± 3.7	1	228.693 ± 16.991	4.592		51.848361	-176.506277
	HMUS-AN-ANT3-1	FAUNA	7/18/2011	9.7 ± 1	0.5	43.231 ± 4.457	2.228		51.853722	-176.470694
Irish Lord - whole	IRLO-AN-ANT1-1	FAUNA	7/19/2011	5.1 ± 2.5	1	23.937 ± 11.734	4.693		51.835694	-176.542138
	IRLO-AN-ANT1-2	FAUNA	7/19/2011	3.2 ± 1.6	1	14.205 ± 7.103	4.439		51.835694	-176.542138
	IRLO-AN-ANT1-3	FAUNA	7/19/2011	5.9 ± 2.5	1	25.927 ± 10.986	4.394		51.835694	-176.542138
	IRLO-AN-ANT2-1	FAUNA	7/19/2011	3.6 ± 1.4	1	17.069 ± 6.638	4.741		51.848361	-176.506277
	IRLO-AN-ANT2-2	FAUNA	7/19/2011	4.1 ± 1.8	1	18.993 ± 8.338	4.632		51.848361	-176.506277
	IRLO-AN-ANT2-3	FAUNA	7/19/2011	12.3 ± 2.4	1	58.636 ± 11.441	4.767		51.848361	-176.506277
	IRLO-AN-ANT3-1	FAUNA	7/17/2011	8.3 ± 2.9	1	39.811 ± 13.91	4.797		51.853722	-176.470694
	IRLO-AN-ANT3-2	FAUNA	7/17/2011	1.9 ± 1.8	1	8.572 ± 8.121	4.512	U	51.853722	-176.470694
	IRLO-AN-ANT3-3	FAUNA	7/17/2011	4.4 ± 2.5	1	19.77 ± 11.233	4.493		51.853722	-176.470694
Octopus	OCTP-AN-AN2M-1	FAUNA	7/18/2011	13.6 ± 2.4	1	68.83 ± 12.146	5.061		51.848361	-176.506277
Pacific Cod - whole	PCOD-AN-AN2M-1	FAUNA	7/17/2011	1.9 ± 1	1	9.242 ± 4.864	4.864	J	51.853722	-176.470694
Rockfish - whole	ROCK-AN-ANT1-1	FAUNA	7/19/2011	13.4 ± 4.1	1	49.574 ± 15.168	3.7		51.835694	-176.542138
	ROCK-AN-ANT2-1	FAUNA	7/18/2011	2.2 ± 1.2	1	8.038 ± 4.385	3.654	J	51.848361	-176.506277
	ROCK-AN-ANT2-2	FAUNA	7/18/2011	1.3 ± 1.6	1	5.312 ± 6.538	4.087	U	51.848361	-176.506277
	ROCK-AN-ANT3-1	FAUNA	7/17/2011	3.9 ± 0.6	1	13.897 ± 2.138	3.563		51.853722	-176.470694
	ROCK-AN-ANT3-2	FAUNA	7/17/2011	2 ± 1.4	1	7.716 ± 5.401	3.858	U	51.853722	-176.470694
	ROCK-AN-ANT3-3	FAUNA	7/17/2011	3.1 ± 1.2	1	12.169 ± 4.711	3.925		51.853722	-176.470694
Sea Urchin - whole	URCH-AN-ANT1-1	FAUNA	7/19/2011	7.4 ± 8.6	2	25.216 ± 29.305	6.815	U	51.835694	-176.542138
	URCH-AN-ANT2-1	FAUNA	7/18/2011	17.4 ± 5.3	1	63.386 ± 19.307	3.643		51.848361	-176.506277
	URCH-AN-ANT3-1	FAUNA	7/17/2011	24.4 ± 5.1	1	92.754 ± 19.387	3.801		51.853722	-176.470694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Amchitka Site (Adak Island South) (AMC15)										
Chiton	CHIT-AS-AST1-1	FAUNA	7/15/2011	29.4 ± 4.3	1	120.806 ± 17.669	4.109		51.737472	-176.48025
	CHIT-AS-AST2-1	FAUNA	7/16/2011	5.1 ± 3.7	1	26.107 ± 18.94	5.119	U	51.745666	-176.507055
	CHIT-AS-AST3-1	FAUNA	7/14/2011	32.5 ± 5.9	1	153.096 ± 27.793	4.711		51.688333	-176.63375
Dragon Kelp	EUAL-AS-AST1-1	VEG	7/15/2011	25.7 ± 2	1	169.356 ± 13.179	6.59		51.737472	-176.48025
	EUAL-AS-AST1-2	VEG	7/15/2011	17.8 ± 2.4	1	141.769 ± 19.115	7.965		51.737472	-176.48025
	EUAL-AS-AST1-3	VEG	7/15/2011	9.4 ± 2.5	1	90.207 ± 23.991	9.596		51.737472	-176.48025
	EUAL-AS-AST2-1	VEG	7/16/2011	15.3 ± 2	1	108.779 ± 14.219	7.11		51.745666	-176.507055
	EUAL-AS-AST2-2	VEG	7/16/2011	20.5 ± 2.2	1	145.054 ± 15.567	7.076		51.745666	-176.507055
	EUAL-AS-AST2-3	VEG	7/16/2011	31.2 ± 3.1	1	226.659 ± 22.521	7.265		51.745666	-176.507055
	EUAL-AS-AST3-1	VEG	7/14/2011	27 ± 2.4	1	197.213 ± 17.53	7.304		51.688333	-176.63375
	EUAL-AS-AST3-2	VEG	7/14/2011	9.3 ± 1.6	1	88.149 ± 15.165	9.478		51.688333	-176.63375
	EUAL-AS-AST3-3	VEG	7/14/2011	13.2 ± 2.4	1	116.388 ± 21.161	8.817		51.688333	-176.63375
	EUAL-AS-DUP	VEG	7/14/2011	1.4 ± 0.2	0.1	10.301 ± 1.472	0.736		51.688333	-176.63375
Rockweed	FUCU-AS-AST1-1	VEG	7/16/2011	64.3 ± 3.5	1	396.643 ± 21.59	6.169		51.733666	-176.470805
	FUCU-AS-AST1-2	VEG	7/16/2011	57.8 ± 3.9	1	320.616 ± 21.633	5.547		51.733666	-176.470805
	FUCU-AS-AST1-3	VEG	7/16/2011	86.4 ± 3.9	1	468.95 ± 21.168	5.428		51.733666	-176.470805
	FUCU-AS-AST2-1	VEG	7/16/2011	72.4 ± 3.7	1	349.956 ± 17.884	4.834		51.745666	-176.507055
	FUCU-AS-AST2-2	VEG	7/16/2011	92.9 ± 4.5	1	470.25 ± 22.779	5.062		51.745666	-176.507055
	FUCU-AS-AST2-3	VEG	7/16/2011	84.7 ± 5.3	1	416.093 ± 26.037	4.913		51.745666	-176.507055
	FUCU-AS-AST3-1	VEG	7/14/2011	71.4 ± 3.7	1	376.399 ± 19.505	5.272		51.688333	-176.63375
	FUCU-AS-AST3-2	VEG	7/14/2011	52.4 ± 4.5	1	258.046 ± 22.16	4.925		51.688333	-176.63375
	FUCU-AS-AST3-3	VEG	7/14/2011	45.5 ± 2	1	238.935 ± 10.503	5.251		51.688333	-176.63375
	FUCU-AS-DUP	VEG	7/16/2011	115 ± 4	1	594.372 ± 20.674	5.168		51.733666	-176.470805
Greenling - whole	GREN-AS-AST1-1	FAUNA	7/15/2011	8.9 ± 1.6	1	42.4 ± 7.622	4.764		51.737472	-176.48025
	GREN-AS-AST1-2	FAUNA	7/15/2011	3.9 ± 1.2	1	18.4 ± 5.662	4.718		51.737472	-176.48025
	GREN-AS-AST1-3	FAUNA	7/15/2011	5.4 ± 1.4	1	25.937 ± 6.724	4.803		51.737472	-176.48025
	GREN-AS-AST2-1	FAUNA	7/16/2011	2 ± 0.6	1	8.033 ± 2.41	4.017	J	51.745666	-176.507055
	GREN-AS-AST2-2	FAUNA	7/16/2011	6.3 ± 1.4	1	28.816 ± 6.404	4.574		51.745666	-176.507055
	GREN-AS-AST2-3	FAUNA	7/16/2011	4.2 ± 2.2	1	19.56 ± 10.246	4.657		51.745666	-176.507055
	GREN-AS-AST3-1	FAUNA	7/14/2011	2.9 ± 1.4	1	13.812 ± 6.668	4.763	J	51.688333	-176.63375
	GREN-AS-AST3-2	FAUNA	7/14/2011	6.2 ± 2	1	29.184 ± 9.414	4.707		51.688333	-176.63375
	GREN-AS-AST3-3	FAUNA	7/14/2011	6.3 ± 1.6	1	30.087 ± 7.641	4.776		51.688333	-176.63375
	GREN-AS-DUP	FAUNA	7/14/2011	8.3 ± 6.1	1	41.621 ± 30.589	5.015	U	51.688333	-176.63375

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Horse Mussel - soft tissue only	HMUS-AS-AST1-1	FAUNA	7/15/2011	34.1 ± 2.4	1	170.84 ± 12.024	5.01		51.737472	-176.48025
	HMUS-AS-AST2-1	FAUNA	7/16/2011	15.3 ± 1.2	1	97.059 ± 7.612	6.344		51.745666	-176.507055
	HMUS-AS-AST3-1	FAUNA	7/14/2011	45.2 ± 3.3	1	230.447 ± 16.825	5.098		51.688333	-176.63375
Irish Lord - whole	IRLO-AS-AST1-1	FAUNA	7/15/2011	8.3 ± 2.5	1	36.541 ± 11.006	4.403		51.737472	-176.48025
	IRLO-AS-AST1-2	FAUNA	7/15/2011	5.3 ± 2.7	1	24.711 ± 12.589	4.663		51.737472	-176.48025
	IRLO-AS-AST1-3	FAUNA	7/15/2011	13.3 ± 1.8	1	60.623 ± 8.205	4.558		51.737472	-176.48025
	IRLO-AS-AST2-1	FAUNA	7/16/2011	16 ± 3.5	1	74.877 ± 16.379	4.68		51.745666	-176.507055
	IRLO-AS-AST2-2	FAUNA	7/16/2011	7 ± 3.1	1	29.801 ± 13.198	4.257		51.745666	-176.507055
	IRLO-AS-AST2-3	FAUNA	7/16/2011	13.8 ± 2.7	1	69.814 ± 13.659	5.059		51.745666	-176.507055
	IRLO-AS-AST3-1	FAUNA	7/14/2011	6.4 ± 1.8	1	28.734 ± 8.081	4.49		51.688333	-176.63375
	IRLO-AS-AST3-2	FAUNA	7/14/2011	2.9 ± 1.8	1	12.254 ± 7.606	4.225	J	51.688333	-176.63375
	IRLO-AS-AST3-3	FAUNA	7/14/2011	5.2 ± 0.6	1	23.727 ± 2.738	4.563		51.688333	-176.63375
Pacific Cod - whole	PCOD-AS-AS2M-1	FAUNA	7/15/2011	1.9 ± 1.2	1	9.506 ± 6.004	5.003	J	51.737472	-176.48025
Rockfish - whole	ROCK-AS-AST1-1	FAUNA	7/15/2011	5.6 ± 1.4	1	20.133 ± 5.033	3.595		51.737472	-176.48025
	ROCK-AS-AST1-2	FAUNA	7/15/2011	3 ± 1	1	11.24 ± 3.747	3.747		51.737472	-176.48025
	ROCK-AS-AST1-3	FAUNA	7/15/2011	4.8 ± 1.6	1	20.666 ± 6.889	4.305		51.737472	-176.48025
	ROCK-AS-AST2-1	FAUNA	7/16/2011	7.2 ± 3.3	1	27.613 ± 12.656	3.835		51.745666	-176.507055
	ROCK-AS-AST2-2	FAUNA	7/16/2011	1.7 ± 2	1	6.314 ± 7.429	3.714	U	51.745666	-176.507055
	ROCK-AS-AST2-3	FAUNA	7/16/2011	4.9 ± 1.4	1	18.909 ± 5.403	3.859		51.745666	-176.507055
	ROCK-AS-AST3-1	FAUNA	7/14/2011	12.8 ± 3.9	2	52.481 ± 15.99	8.2		51.688333	-176.63375
	ROCK-AS-AST3-2	FAUNA	7/14/2011	11.3 ± 1.8	1	47.912 ± 7.632	4.24		51.688333	-176.63375
	ROCK-AS-AST3-3	FAUNA	7/14/2011	3.7 ± 1.6	1	16.056 ± 6.943	4.34		51.688333	-176.63375
	ROCK-AS-DUP	FAUNA	7/14/2011	2.6 ± 2.7	1	10.179 ± 10.57	3.915	U	51.688333	-176.63375
Sea Urchin - whole	URCH-AS-AST1-1	FAUNA	7/15/2011	25.2 ± 5.3	1	95.718 ± 20.131	3.798		51.737472	-176.48025
	URCH-AS-AST2-1	FAUNA	7/16/2011	26 ± 3.9	1	104.963 ± 15.744	4.037		51.745666	-176.507055
	URCH-AS-AST3-1	FAUNA	7/14/2011	28.5 ± 10.2	1	106.423 ± 38.088	3.734		51.688333	-176.63375
^{234}Uranium (pCi/kg)										
Amchitka Site (AMC01)										
Dolly Varden - whole	DOLL-AI-XXX-1	FAUNA	6/24/2011	0.0104 ± 0.0008	0.0004	0.04 ± 0.003	0.002		51.468283	179.108052
Goose Egg - no shell	GOOS-AI-XXX-1	FAUNA	6/24/2011	0.0008 ± 0.0004	0.0008	0.002 ± 0.001	0.002	J	51.491305	179.0595
Glaucous-winged Gull Egg - no shell	GWGU-AI-XXX-1	FAUNA	6/24/2011	0.0007 ± 0.0002	0.0002	0.002 ± 0.001	0.001		51.456388	179.167

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Amchitka Site (Long Shot) (AMC02)										
Chiton	CHIT-LS-LT1-1	FAUNA	7/4/2011	0.124 ± 0.004	0.0003	0.615 ± 0.02	0.001		51.457555	179.195138
	CHIT-LS-LT2-1	FAUNA	7/3/2011	0.91 ± 0.02	0.0004	4.263 ± 0.094	0.002		51.44925	179.205583
	CHIT-LS-LT3-1	FAUNA	7/3/2011	0.7 ± 0.02	0.0004	3.333 ± 0.095	0.002		51.43	179.22667
Dragon Kelp	EUAL-LS-DUP	VEG	7/3/2011	0.91 ± 0.04	0.0004	5.465 ± 0.24	0.002		51.44925	179.205583
	EUAL-LS-LT1-1	VEG	7/4/2011	0.51 ± 0.02	0.0003	4.765 ± 0.187	0.003		51.457555	179.195138
	EUAL-LS-LT1-2	VEG	7/4/2011	1.13 ± 0.02	0.0003	7.025 ± 0.124	0.002		51.457555	179.195138
	EUAL-LS-LT1-3	VEG	7/4/2011	1.09 ± 0.04	0.0004	6.581 ± 0.241	0.002		51.457555	179.195138
	EUAL-LS-LT2-1	VEG	7/3/2011	0.99 ± 0.04	0.0004	5.988 ± 0.242	0.002		51.44925	179.205583
	EUAL-LS-LT2-2	VEG	7/3/2011	0.406 ± 0.008	0.0003	2.948 ± 0.058	0.002		51.44925	179.205583
	EUAL-LS-LT2-3	VEG	7/3/2011	0.58 ± 0.02	0.0005	4.195 ± 0.145	0.004		51.44925	179.205583
	EUAL-LS-LT3-1	VEG	7/2/2011	1.2 ± 0.02	0.0004	7.659 ± 0.128	0.003		51.43	179.22667
	EUAL-LS-LT3-2	VEG	7/2/2011	1.5 ± 0.02	0.0005	10.674 ± 0.142	0.004		51.43	179.22667
	EUAL-LS-LT3-3	VEG	7/2/2011	0.425 ± 0.008	0.0004	3.585 ± 0.067	0.003		51.43	179.22667
Rockweed	FUCU-LS-DUP	VEG	6/22/2011	2.35 ± 0.04	0.0003	12.914 ± 0.22	0.002		51.447472	179.190888
	FUCU-LS-LT1-1	VEG	6/22/2011	3.12 ± 0.04	0.0003	16.855 ± 0.216	0.002		51.447527	179.189361
	FUCU-LS-LT1-2	VEG	6/22/2011	2.63 ± 0.06	0.0004	16.088 ± 0.367	0.002		51.447527	179.189361
	FUCU-LS-LT1-3	VEG	6/22/2011	2.14 ± 0.04	0.0004	14.229 ± 0.266	0.003		51.448777	179.189305
	FUCU-LS-LT2-1	VEG	6/22/2011	1.22 ± 0.02	0.0002	9.619 ± 0.158	0.002		51.447222	179.199361
	FUCU-LS-LT2-2	VEG	6/22/2011	1.98 ± 0.02	0.0002	14.352 ± 0.145	0.001		51.44625	179.196972
	FUCU-LS-LT2-3	VEG	6/22/2011	2.55 ± 0.04	0.0003	15.595 ± 0.245	0.002		51.446722	179.191888
	FUCU-LS-LT3-1	VEG	7/2/2011	3.15 ± 0.06	0.0004	15.258 ± 0.291	0.002		51.433611	179.219305
	FUCU-LS-LT3-2	VEG	7/2/2011	2.37 ± 0.06	0.0004	10.785 ± 0.273	0.002		51.430166	179.218694
	FUCU-LS-LT3-3	VEG	7/2/2011	3.4 ± 0.08	0.0005	12.459 ± 0.293	0.002		51.430166	179.218694
Greenling - whole	GREN-LS-DUP	FAUNA	7/12/2011	0.287 ± 0.008	0.0004	1.394 ± 0.039	0.002		51.434527	179.234416
	GREN-LS-LT1-1	FAUNA	7/4/2011	0.104 ± 0.004	0.0003	0.49 ± 0.019	0.001		51.457555	179.195138
	GREN-LS-LT1-2	FAUNA	7/4/2011	0.075 ± 0.004	0.0003	0.355 ± 0.019	0.001		51.457555	179.195138
	GREN-LS-LT1-3	FAUNA	7/5/2011	0.134 ± 0.008	0.0005	0.628 ± 0.037	0.002		51.457555	179.195138
	GREN-LS-LT2-1	FAUNA	7/3/2011	0.266 ± 0.006	0.0003	1.285 ± 0.029	0.001		51.432194	179.230277
	GREN-LS-LT2-2	FAUNA	7/3/2011	0.142 ± 0.004	0.0003	0.655 ± 0.018	0.001		51.432194	179.230277
	GREN-LS-LT2-3	FAUNA	7/3/2011	0.2 ± 0.006	0.0003	0.952 ± 0.029	0.001		51.432194	179.230277
	GREN-LS-LT3-1	FAUNA	7/3/2011	0.167 ± 0.004	0.0004	0.741 ± 0.018	0.002		51.43	179.22667
	GREN-LS-LT3-2	FAUNA	7/12/2011	0.25 ± 0.02	0.0004	1.226 ± 0.098	0.002		51.434527	179.234416
	GREN-LS-LT3-3	FAUNA	7/12/2011	0.207 ± 0.008	0.0004	1.001 ± 0.039	0.002		51.434527	179.234416
Halibut - whole	HALI-LS-L2M-1	FAUNA	7/13/2011	0.011 ± 0.002	0.0002	0.042 ± 0.008	0.001		51.40025	179.283361

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Horse Mussel - soft tissue only	HMUS-LS-LT1-1	FAUNA	7/5/2011	2.86 ± 0.06	0.0004	12.252 ± 0.257	0.002		51.457555	179.195138
	HMUS-LS-LT2-1	FAUNA	7/4/2011	1.41 ± 0.02	0.0004	5.76 ± 0.082	0.002		51.44925	179.205583
	HMUS-LS-LT3-1	FAUNA	7/3/2011	0.53 ± 0.04	0.0098	1.112 ± 0.084	0.021		51.44925	179.205583
Irish Lord - whole	IRLO-LS-LT1-1	FAUNA	7/4/2011	0.093 ± 0.006	0.0004	0.439 ± 0.028	0.002		51.457555	179.195138
	IRLO-LS-LT1-2	FAUNA	7/4/2011	0.085 ± 0.004	0.0004	0.402 ± 0.019	0.002		51.457555	179.195138
	IRLO-LS-LT1-3	FAUNA	7/5/2011	0.179 ± 0.006	0.0004	0.949 ± 0.032	0.002		51.457555	179.195138
	IRLO-LS-LT2-1	FAUNA	7/3/2011	0.415 ± 0.008	0.0004	1.796 ± 0.035	0.002		51.432194	179.230277
	IRLO-LS-LT2-2	FAUNA	7/3/2011	0.331 ± 0.006	0.0004	1.371 ± 0.025	0.002		51.432194	179.230277
	IRLO-LS-LT2-3	FAUNA	7/3/2011	0.68 ± 0.02	0.0007	3.012 ± 0.089	0.003		51.432194	179.230277
	IRLO-LS-LT3-1	FAUNA	7/2/2011	0.362 ± 0.01	0.0004	1.615 ± 0.045	0.002		51.43	179.22667
	IRLO-LS-LT3-2	FAUNA	7/12/2011	0.27 ± 0.02	0.0003	1.281 ± 0.095	0.001		51.434944	179.2315
	IRLO-LS-LT3-3	FAUNA	7/12/2011	0.23 ± 0.01	0.0003	1.271 ± 0.055	0.002		51.434944	179.2315
Octopus	OCTP-LS-L2M-1	FAUNA	7/3/2011	0.77 ± 0.02	0.0002	5.488 ± 0.143	0.001		51.44925	179.205583
Pacific Cod - whole	PCOD-LS-L2M-1	FAUNA	7/4/2011	0.078 ± 0.004	0.0003	0.388 ± 0.02	0.001		51.451805	179.196972
Rockfish - whole	ROCK-LS-DUP	FAUNA	7/12/2011	0.165 ± 0.002	0.0004	0.643 ± 0.008	0.002		51.434944	179.2315
	ROCK-LS-DUP2	FAUNA	7/12/2011	0.52 ± 0.004	0.0004	2.225 ± 0.017	0.002		51.465472	179.206722
	ROCK-LS-LT1-1	FAUNA	7/4/2011	0.23 ± 0.02	0.0004	1.068 ± 0.093	0.002		51.457555	179.195138
	ROCK-LS-LT1-2	FAUNA	7/12/2011	0.218 ± 0.006	0.0004	0.901 ± 0.025	0.002		51.465472	179.206722
	ROCK-LS-LT1-3	FAUNA	7/12/2011	0.136 ± 0.004	0.0004	0.561 ± 0.017	0.002		51.465472	179.206722
	ROCK-LS-LT2-1	FAUNA	7/4/2011	0.484 ± 0.008	0.0004	1.941 ± 0.032	0.002		51.44925	179.205583
	ROCK-LS-LT2-2	FAUNA	7/12/2011	0.452 ± 0.01	0.0004	1.784 ± 0.039	0.002		51.44625	179.223416
	ROCK-LS-LT3-1	FAUNA	7/12/2011	0.574 ± 0.004	0.0004	2.526 ± 0.018	0.002		51.434944	179.2315
	ROCK-LS-LT3-2	FAUNA	7/12/2011	0.322 ± 0.006	0.0004	1.366 ± 0.025	0.002		51.434944	179.2315
	ROCK-LS-LT3-3	FAUNA	7/3/2011	0.278 ± 0.008	0.0004	0.959 ± 0.028	0.001		51.43	179.22667
Reindeer Lichen	STRL-AI-LT1-2	VEG	6/22/2011	0.115 ± 0.004	0.0003	0.349 ± 0.012	0.001		51.447361	179.189111
Sea Urchin - whole	URCH-LS-LT1-1	FAUNA	7/4/2011	0.77 ± 0.02	0.0005	3.008 ± 0.078	0.002		51.457555	179.195138
	URCH-LS-LT2-1	FAUNA	7/3/2011	0.67 ± 0.02	0.0005	2.574 ± 0.077	0.002		51.44925	179.205583
	URCH-LS-LT3-1	FAUNA	7/2/2011	0.82 ± 0.02	0.0005	3.194 ± 0.078	0.002		51.43	179.22667
Amchitka Site (Milrow) (AMC03)										
Chiton	CHIT-ML-MT1-1	FAUNA	7/9/2011	0.63 ± 0.02	0.0005	2.376 ± 0.075	0.002		51.408472	179.139166
	CHIT-ML-MT2-1	FAUNA	7/10/2011	0.93 ± 0.04	0.0004	4.318 ± 0.186	0.002		51.389416	179.173138
	CHIT-ML-MT3-1	FAUNA	7/10/2011	0.89 ± 0.02	0.0004	4.039 ± 0.091	0.002		51.387805	179.184

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Dragon Kelp	EUAL-ML-DUP	VEG	7/9/2011	0.64 ± 0.02	0.0003	4.823 ± 0.151	0.002		51.408472	179.139166
	EUAL-ML-MT1-1	VEG	7/9/2011	0.63 ± 0.02	0.0003	5.036 ± 0.16	0.002		51.408472	179.139166
	EUAL-ML-MT1-2	VEG	7/9/2011	0.8 ± 0.02	0.0004	5.953 ± 0.149	0.003		51.408472	179.139166
	EUAL-ML-MT1-3	VEG	7/9/2011	0.494 ± 0.008	0.0003	4.155 ± 0.067	0.003		51.408472	179.139166
	EUAL-ML-MT2-1	VEG	7/10/2011	1.42 ± 0.02	0.0007	10.583 ± 0.149	0.005		51.389416	179.173138
	EUAL-ML-MT2-2	VEG	7/10/2011	0.96 ± 0.04	0.0003	6.802 ± 0.283	0.002		51.389416	179.173138
	EUAL-ML-MT2-3	VEG	7/10/2011	0.77 ± 0.02	0.0003	5.804 ± 0.151	0.002		51.389416	179.173138
	EUAL-ML-MT3-1	VEG	7/10/2011	0.74 ± 0.02	0.0004	5.205 ± 0.141	0.003		51.387805	179.184
	EUAL-ML-MT3-2	VEG	7/10/2011	0.77 ± 0.04	0.0004	5.626 ± 0.292	0.003		51.387805	179.184
	EUAL-ML-MT3-3	VEG	7/10/2011	1.4 ± 0.04	0.0004	9.655 ± 0.276	0.003		51.387805	179.184
Rockweed	FUCU-ML-DUP	VEG	6/20/2011	3.59 ± 0.04	0.0004	15.577 ± 0.174	0.002		51.412449	179.160843
	FUCU-ML-MT1-1	VEG	6/20/2011	3.38 ± 0.02	0.0004	14.081 ± 0.083	0.002		51.412449	179.160843
	FUCU-ML-MT1-2	VEG	6/21/2011	3.14 ± 0.04	0.0003	19.048 ± 0.243	0.002		51.417083	179.134083
	FUCU-ML-MT1-3	VEG	7/9/2011	3.8 ± 0.2	0.0004	17.467 ± 0.919	0.002		51.417083	179.134083
	FUCU-ML-MT2-1	VEG	6/20/2011	3.23 ± 0.04	0.0004	16.67 ± 0.206	0.002		51.403305	179.167166
	FUCU-ML-MT2-2	VEG	6/21/2011	1.94 ± 0.06	0.0003	13.63 ± 0.422	0.002		51.405694	179.161361
	FUCU-ML-MT2-3	VEG	6/21/2011	1.84 ± 0.02	0.0003	12.776 ± 0.139	0.002		51.405694	179.161361
	FUCU-ML-MT3-1	VEG	7/10/2011	4.8 ± 0.2	0.0004	23.31 ± 0.971	0.002		51.389416	179.173138
	FUCU-ML-MT3-2	VEG	7/10/2011	5.1 ± 0.2	0.0004	24.493 ± 0.961	0.002		51.389416	179.173138
	FUCU-ML-MT3-3	VEG	7/10/2011	4.58 ± 0.1	0.0004	23.123 ± 0.505	0.002		51.389416	179.173138
Greenling - whole	GREN-ML-DUP	FAUNA	7/10/2011	0.215 ± 0.006	0.0003	1.043 ± 0.029	0.001		51.387805	179.184
	GREN-ML-MT1-1	FAUNA	7/9/2011	0.191 ± 0.004	0.0004	0.832 ± 0.017	0.002		51.408472	179.139166
	GREN-ML-MT1-2	FAUNA	7/9/2011	0.234 ± 0.006	0.0004	1.083 ± 0.028	0.002		51.408472	179.139166
	GREN-ML-MT1-3	FAUNA	7/9/2011	0.385 ± 0.008	0.0003	1.859 ± 0.039	0.001		51.408472	179.139166
	GREN-ML-MT2-1	FAUNA	7/11/2011	0.118 ± 0.004	0.0003	0.55 ± 0.019	0.001		51.396944	179.1435
	GREN-ML-MT2-2	FAUNA	7/11/2011	0.168 ± 0.004	0.0003	0.786 ± 0.019	0.001		51.396944	179.1435
	GREN-ML-MT2-3	FAUNA	7/11/2011	0.124 ± 0.006	0.0003	0.592 ± 0.029	0.001		51.396944	179.1435
	GREN-ML-MT3-1	FAUNA	7/10/2011	0.364 ± 0.012	0.0004	1.765 ± 0.058	0.002		51.387805	179.184
	GREN-ML-MT3-2	FAUNA	7/10/2011	0.111 ± 0.006	0.0004	0.536 ± 0.029	0.002		51.387805	179.184
	GREN-ML-MT3-3	FAUNA	7/10/2011	0.186 ± 0.008	0.0003	0.881 ± 0.038	0.001		51.387805	179.184
Halibut - whole	HALI-ML-M2M-1	FAUNA	7/11/2011	0.028 ± 0.002	0.0004	0.097 ± 0.007	0.001		51.365055	179.111472
Horse Mussel - soft tissue only	HMUS-ML-MT1-1	FAUNA	7/9/2011	2.49 ± 0.06	0.0004	11.323 ± 0.273	0.002		51.408472	179.139166
	HMUS-ML-MT2-1	FAUNA	7/11/2011	1.46 ± 0.02	0.0004	6.566 ± 0.09	0.002		51.389416	179.173138
	HMUS-ML-MT3-1	FAUNA	7/10/2011	1.63 ± 0.02	0.0004	7.483 ± 0.092	0.002		51.387805	179.184

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Irish Lord - whole	IRLO-ML-MT1-1	FAUNA	7/9/2011	0.178 ± 0.008	0.0005	0.76 ± 0.034	0.002		51.408472	179.139166
	IRLO-ML-MT1-2	FAUNA	7/9/2011	0.113 ± 0.002	0.0004	0.536 ± 0.009	0.002		51.408472	179.139166
	IRLO-ML-MT1-3	FAUNA	7/9/2011	0.096 ± 0.004	0.0005	0.45 ± 0.019	0.002		51.408472	179.139166
	IRLO-ML-MT2-1	FAUNA	7/10/2011	0.207 ± 0.008	0.0005	0.892 ± 0.034	0.002		51.389416	179.173138
	IRLO-ML-MT2-2	FAUNA	7/11/2011	0.089 ± 0.008	0.0006	0.383 ± 0.034	0.003		51.396944	179.1435
	IRLO-ML-MT2-3	FAUNA	7/11/2011	0.153 ± 0.006	0.0004	0.726 ± 0.028	0.002		51.396944	179.1435
	IRLO-ML-MT3-1	FAUNA	7/10/2011	0.348 ± 0.006	0.0003	1.962 ± 0.034	0.002		51.387805	179.184
	IRLO-ML-MT3-2	FAUNA	7/10/2011	0.19 ± 0.004	0.0004	0.917 ± 0.019	0.002		51.387805	179.184
	IRLO-ML-MT3-3	FAUNA	7/10/2011	0.281 ± 0.006	0.0003	1.575 ± 0.034	0.002		51.387805	179.184
Octopus	OCTP-ML-M2M-1	FAUNA	7/10/2011	0.365 ± 0.004	0.0002	1.721 ± 0.019	0.001		51.389416	179.173138
Pacific Cod - whole	PCOD-ML-M2M-1	FAUNA	7/10/2011	0.09 ± 0.004	0.0003	0.476 ± 0.021	0.002		51.408472	179.139166
Rockfish - whole	ROCK-ML-DUP	FAUNA	7/9/2011	0.6 ± 0.02	0.0004	2.652 ± 0.088	0.002		51.408472	179.139166
	ROCK-ML-MT1-1	FAUNA	7/9/2011	0.249 ± 0.016	0.0003	1.096 ± 0.07	0.001		51.408472	179.139166
	ROCK-ML-MT1-2	FAUNA	7/9/2011	0.524 ± 0.016	0.0005	2.3 ± 0.07	0.002		51.408472	179.139166
	ROCK-ML-MT1-3	FAUNA	7/9/2011	0.34 ± 0.006	0.0005	1.439 ± 0.025	0.002		51.408472	179.139166
	ROCK-ML-MT2-1	FAUNA	7/11/2011	0.269 ± 0.008	0.0004	1.01 ± 0.03	0.002		51.365055	179.111472
	ROCK-ML-MT2-2	FAUNA	7/11/2011	0.59 ± 0.02	0.0004	2.387 ± 0.081	0.002		51.365055	179.111472
	ROCK-ML-MT2-3	FAUNA	7/11/2011	0.521 ± 0.012	0.0003	2.347 ± 0.054	0.001		51.365055	179.111472
	ROCK-ML-MT3-1	FAUNA	7/10/2011	0.443 ± 0.012	0.0004	2.091 ± 0.057	0.002		51.387805	179.184
	ROCK-ML-MT3-2	FAUNA	7/10/2011	0.131 ± 0.008	0.0004	0.471 ± 0.029	0.001		51.387805	179.184
	ROCK-ML-MT3-3	FAUNA	7/10/2011	0.092 ± 0.006	0.0007	0.214 ± 0.014	0.002		51.387805	179.184
Reindeer Lichen	STRL-AI-ML-1	VEG	6/21/2011	0.103 ± 0.004	0.0005	0.369 ± 0.014	0.002		51.402583	179.183972
Sea Urchin - whole	URCH-ML-MT1-1	FAUNA	7/9/2011	0.83 ± 0.02	0.0005	3.079 ± 0.074	0.002		51.408472	179.139166
	URCH-ML-MT2-1	FAUNA	7/10/2011	0.81 ± 0.02	0.0005	3.025 ± 0.075	0.002		51.389416	179.173138
	URCH-ML-MT3-1	FAUNA	7/10/2011	0.75 ± 0.02	0.0004	2.977 ± 0.079	0.002		51.387805	179.184
Amchitka Site (Cannikin) (AMC05)										
Chiton	CHIT-CN-CT1-1	FAUNA	7/8/2011	1.14 ± 0.02	0.0004	5.339 ± 0.094	0.002		51.482972	179.123833
	CHIT-CN-CT2-1	FAUNA	7/7/2011	1.11 ± 0.04	0.0004	5.253 ± 0.189	0.002		51.472611	179.151111
	CHIT-CN-CT3-1	FAUNA	7/5/2011	0.84 ± 0.02	0.0004	4.123 ± 0.098	0.002		51.471416	179.172861

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Dragon Kelp	EUAL-CN-CT1-1	VEG	7/8/2011	0.82 ± 0.02	0.0002	6.07 ± 0.148	0.001		51.482972	179.123833
	EUAL-CN-CT1-2	VEG	7/8/2011	0.66 ± 0.02	0.0003	4.303 ± 0.13	0.002		51.482972	179.123833
	EUAL-CN-CT1-3	VEG	7/8/2011	0.94 ± 0.02	0.0003	5.758 ± 0.123	0.002		51.482972	179.123833
	EUAL-CN-CT2-1	VEG	7/6/2011	0.85 ± 0.02	0.0003	5.421 ± 0.128	0.002		51.472611	179.151111
	EUAL-CN-CT2-2	VEG	7/6/2011	1.38 ± 0.06	0.0004	8.662 ± 0.377	0.003		51.472611	179.151111
	EUAL-CN-CT2-3	VEG	7/7/2011	0.6 ± 0.02	0.0003	4.35 ± 0.145	0.002		51.472611	179.151111
	EUAL-CN-CT3-1	VEG	7/5/2011	0.695 ± 0.008	0.0003	4.846 ± 0.056	0.002		51.471416	179.172861
	EUAL-CN-CT3-2	VEG	7/5/2011	0.49 ± 0.02	0.0005	3.523 ± 0.144	0.004		51.471416	179.172861
	EUAL-CN-CT3-3	VEG	7/5/2011	0.84 ± 0.02	0.0003	5.46 ± 0.13	0.002		51.471416	179.172861
	EUAL-CN-DUP	VEG	7/6/2011	0.305 ± 0.008	0.0003	2.027 ± 0.053	0.002		51.471416	179.172861
Rockweed	FUCU-CN-CT1-1	VEG	6/23/2011	1.878 ± 0.01	0.0003	10.83 ± 0.058	0.002		51.481888	179.118138
	FUCU-CN-CT1-2	VEG	6/23/2011	2.13 ± 0.04	0.0003	13.415 ± 0.252	0.002		51.481888	179.118138
	FUCU-CN-CT1-3	VEG	6/23/2011	2.44 ± 0.04	0.0004	14.384 ± 0.236	0.002		51.481888	179.118138
	FUCU-CN-CT2-1	VEG	7/8/2011	4.58 ± 0.08	0.0005	18.927 ± 0.331	0.002		51.476638	179.135277
	FUCU-CN-CT2-2	VEG	7/8/2011	4.4 ± 0.2	0.0004	19.524 ± 0.887	0.002		51.476638	179.135277
	FUCU-CN-CT2-3	VEG	7/12/2011	1.87 ± 0.06	0.0004	9.885 ± 0.317	0.002		51.467583	179.153583
	FUCU-CN-CT3-1	VEG	7/6/2011	1.84 ± 0.04	0.0004	9.915 ± 0.216	0.002		51.465027	179.173166
	FUCU-CN-CT3-2	VEG	7/6/2011	1.48 ± 0.06	0.0004	8.687 ± 0.352	0.002		51.465472	179.170583
	FUCU-CN-CT3-3	VEG	7/6/2011	2.73 ± 0.04	0.0004	17.325 ± 0.254	0.003		51.464638	179.159305
	FUCU-CN-DUP	VEG	6/23/2011	1.87 ± 0.02	0.0003	12.065 ± 0.129	0.002		51.481888	179.118138
Greenling - whole	GREN-CN-CT1-1	FAUNA	7/8/2011	0.282 ± 0.006	0.0003	1.359 ± 0.029	0.001		51.482972	179.123833
	GREN-CN-CT1-2	FAUNA	7/8/2011	0.247 ± 0.008	0.0004	1.173 ± 0.038	0.002		51.482972	179.123833
	GREN-CN-CT1-3	FAUNA	7/8/2011	0.23 ± 0.008	0.0004	1.048 ± 0.036	0.002		51.482972	179.123833
	GREN-CN-CT2-1	FAUNA	7/7/2011	0.275 ± 0.01	0.0003	1.34 ± 0.049	0.001		51.472611	179.151111
	GREN-CN-CT2-2	FAUNA	7/7/2011	0.106 ± 0.006	0.0004	0.486 ± 0.028	0.002		51.472611	179.151111
	GREN-CN-CT2-3	FAUNA	7/7/2011	0.182 ± 0.006	0.0004	0.84 ± 0.028	0.002		51.472611	179.151111
	GREN-CN-CT3-1	FAUNA	7/5/2011	0.206 ± 0.006	0.0004	0.939 ± 0.027	0.002		51.471416	179.172861
	GREN-CN-CT3-2	FAUNA	7/5/2011	0.335 ± 0.012	0.0004	1.459 ± 0.052	0.002		51.471416	179.172861
	GREN-CN-CT3-3	FAUNA	7/5/2011	0.142 ± 0.004	0.0003	0.652 ± 0.018	0.001		51.471416	179.172861
	GREN-CN-DUP	FAUNA	7/8/2011	0.188 ± 0.006	0.0004	0.907 ± 0.029	0.002		51.482972	179.123833
Halibut - whole	HALI-CN-C2M-1	FAUNA	7/13/2011	0.0088 ± 0.0002	0.0002	0.034 ± 0.001	0.001		51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-CN-CT1-1	FAUNA	7/8/2011	0.85 ± 0.02	0.0004	3.494 ± 0.082	0.002		51.482972	179.123833
	HMUS-CN-CT2-1	FAUNA	7/7/2011	2.29 ± 0.02	0.0004	10.377 ± 0.091	0.002		51.472611	179.151111
	HMUS-CN-CT3-1	FAUNA	7/5/2011	1.78 ± 0.04	0.0004	7.302 ± 0.164	0.002		51.471416	179.172861

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Irish Lord - whole	IRLO-CN-CT1-1	FAUNA	7/8/2011	0.172 ± 0.004	0.0004	0.775 ± 0.018	0.002		51.482972	179.123833
	IRLO-CN-CT1-2	FAUNA	7/8/2011	0.43 ± 0.02	0.0005	2.155 ± 0.1	0.003		51.482972	179.123833
	IRLO-CN-CT1-3	FAUNA	7/8/2011	0.339 ± 0.006	0.0005	1.592 ± 0.028	0.002		51.482972	179.123833
	IRLO-CN-CT2-1	FAUNA	7/7/2011	0.27 ± 0.006	0.0004	1.272 ± 0.028	0.002		51.472611	179.151111
	IRLO-CN-CT2-2	FAUNA	7/7/2011	0.377 ± 0.01	0.0005	1.722 ± 0.046	0.002		51.472611	179.151111
	IRLO-CN-CT2-3	FAUNA	7/7/2011	0.178 ± 0.006	0.0004	0.876 ± 0.03	0.002		51.472611	179.151111
	IRLO-CN-CT3-1	FAUNA	7/5/2011	0.24 ± 0.01	0.0003	1.237 ± 0.052	0.002		51.471416	179.172861
	IRLO-CN-CT3-2	FAUNA	7/5/2011	0.167 ± 0.006	0.0003	0.81 ± 0.029	0.001		51.471416	179.172861
	IRLO-CN-CT3-3	FAUNA	7/5/2011	0.113 ± 0.004	0.0003	0.542 ± 0.019	0.001		51.471416	179.172861
Octopus	OCTP-CN-C2M-1	FAUNA	7/8/2011	0.389 ± 0.006	0.0003	1.906 ± 0.029	0.001		51.482972	179.123833
Pacific Cod - whole	PCOD-CN-C2M-1	FAUNA	7/6/2011	0.033 ± 0.002	0.0003	0.151 ± 0.009	0.001		51.483527	179.187583
Rockfish - whole	ROCK-CN-CT1-1	FAUNA	7/8/2011	0.084 ± 0.006	0.0004	0.332 ± 0.024	0.002		51.482972	179.123833
	ROCK-CN-CT1-2	FAUNA	7/8/2011	0.143 ± 0.006	0.0004	0.552 ± 0.023	0.002		51.482972	179.123833
	ROCK-CN-CT1-3	FAUNA	7/8/2011	0.35 ± 0.004	0.0004	1.406 ± 0.016	0.002		51.482972	179.123833
	ROCK-CN-CT2-1	FAUNA	7/6/2011	0.136 ± 0.008	0.0003	0.48 ± 0.028	0.001		51.472611	179.151111
	ROCK-CN-CT2-2	FAUNA	7/6/2011	0.23 ± 0.01	0.0004	0.842 ± 0.037	0.001		51.472611	179.151111
	ROCK-CN-CT2-3	FAUNA	7/6/2011	0.239 ± 0.008	0.0004	0.978 ± 0.033	0.002		51.472611	179.151111
	ROCK-CN-CT3-1	FAUNA	7/6/2011	0.236 ± 0.006	0.0004	1.008 ± 0.026	0.002		51.471416	179.172861
	ROCK-CN-CT3-2	FAUNA	7/6/2011	0.232 ± 0.006	0.0004	0.891 ± 0.023	0.002		51.471416	179.172861
	ROCK-CN-CT3-3	FAUNA	7/6/2011	0.337 ± 0.008	0.0004	1.408 ± 0.033	0.002		51.471416	179.172861
	ROCK-CN-DUP	FAUNA	7/6/2011	0.193 ± 0.004	0.0004	0.775 ± 0.016	0.002		51.471416	179.172861
Reindeer Lichen	STRL-AI-CT1-1	VEG	6/23/2011	0.42 ± 0.02	0.0007	0.666 ± 0.032	0.001		51.480583	179.109472
Sea Urchin - whole	URCH-CN-CT1-1	FAUNA	7/8/2011	0.7 ± 0.02	0.0004	2.809 ± 0.08	0.002		51.482972	179.123833
	URCH-CN-CT2-1	FAUNA	7/7/2011	0.6 ± 0.02	0.0005	2.056 ± 0.069	0.002		51.472611	179.151111
	URCH-CN-CT3-1	FAUNA	7/5/2011	0.573 ± 0.01	0.0005	2.195 ± 0.038	0.002		51.471416	179.172861
Amchitka Site (Adak Island) (AMC13)										
Dolly Varden - whole	DOLL-AD-XXX-1	FAUNA	6/28/2011	0.0158 ± 0.0004	0.0002	0.064 ± 0.002	0.001		51.8375	-176.672555
Reindeer Lichen	STRL-AD-XXX-1	VEG	6/28/2011	0.151 ± 0.008	0.0004	0.296 ± 0.016	0.001		51.837527	-176.670694
	STRL-AD-XXX-2	VEG	6/29/2011	0.141 ± 0.006	0.0004	0.348 ± 0.015	0.001		51.872833	-176.707444
	STRL-AD-XXX-3	VEG	6/29/2011	0.232 ± 0.008	0.0005	0.369 ± 0.013	0.001		51.900805	-176.688527
Amchitka Site (Adak Island North) (AMC14)										
Chiton	CHIT-AN-ANT1-1	FAUNA	7/20/2011	0.46 ± 0.02	0.0004	2.24 ± 0.097	0.002		51.838722	-176.582805
	CHIT-AN-ANT2-1	FAUNA	7/18/2011	0.32 ± 0.02	0.0003	1.604 ± 0.1	0.002		51.848361	-176.506277
	CHIT-AN-ANT3-1	FAUNA	7/17/2011	0.28 ± 0.02	0.0003	1.424 ± 0.102	0.002		51.853722	-176.470694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Dragon Kelp	EUAL-AN-ANT1-1	VEG	7/19/2011	0.55 ± 0.02	0.0004	4.612 ± 0.168	0.003		51.835694	-176.542138
	EUAL-AN-ANT1-2	VEG	7/19/2011	0.6 ± 0.02	0.0004	4.09 ± 0.136	0.003		51.835694	-176.542138
	EUAL-AN-ANT1-3	VEG	7/19/2011	0.51 ± 0.02	0.0004	3.942 ± 0.155	0.003		51.835694	-176.542138
	EUAL-AN-ANT2-1	VEG	7/18/2011	0.94 ± 0.02	0.0004	6.852 ± 0.146	0.003		51.848361	-176.506277
	EUAL-AN-ANT2-2	VEG	7/18/2011	1.17 ± 0.04	0.0004	7.456 ± 0.255	0.003		51.848361	-176.506277
	EUAL-AN-ANT2-3	VEG	7/18/2011	0.71 ± 0.02	0.0005	4.932 ± 0.139	0.003		51.848361	-176.506277
	EUAL-AN-ANT3-1	VEG	7/17/2011	0.268 ± 0.008	0.0002	2.003 ± 0.06	0.001		51.853722	-176.470694
	EUAL-AN-ANT3-2	VEG	7/17/2011	1 ± 0.02	0.0003	6.819 ± 0.136	0.002		51.853722	-176.470694
	EUAL-AN-ANT3-3	VEG	7/17/2011	0.61 ± 0.02	0.0003	4.093 ± 0.134	0.002		51.853722	-176.470694
	EUAL-AN-DUP	VEG	7/17/2011	1.62 ± 0.04	0.0004	10.186 ± 0.252	0.003		51.853722	-176.470694
Rockweed	FUCU-AN-ANT1-1	VEG	7/19/2011	2.91 ± 0.04	0.0003	14.826 ± 0.204	0.002		51.841444	-176.546083
	FUCU-AN-ANT1-2	VEG	7/20/2011	1.7 ± 0.02	0.0004	10.967 ± 0.129	0.003		51.8395	-176.591305
	FUCU-AN-ANT1-3	VEG	7/20/2011	2.7 ± 0.04	0.0005	14.735 ± 0.218	0.003		51.8395	-176.591305
	FUCU-AN-ANT2-1	VEG	7/18/2011	2.75 ± 0.08	0.0004	17.367 ± 0.505	0.003		51.837666	-176.517527
	FUCU-AN-ANT2-2	VEG	7/18/2011	1.58 ± 0.08	0.0004	8.399 ± 0.425	0.002		51.841444	-176.546083
	FUCU-AN-ANT2-3	VEG	7/18/2011	4.01 ± 0.08	0.0005	16.916 ± 0.337	0.002		51.8395	-176.591305
	FUCU-AN-ANT3-1	VEG	7/18/2011	2.16 ± 0.04	0.0004	12.358 ± 0.229	0.002		51.839944	-176.515916
	FUCU-AN-ANT3-2	VEG	7/18/2011	3.17 ± 0.06	0.0004	15.496 ± 0.293	0.002		51.828972	-176.448305
	FUCU-AN-ANT3-3	VEG	7/18/2011	2.98 ± 0.02	0.0003	14.816 ± 0.099	0.001		51.830833	-176.456361
	FUCU-AN-DUP	VEG	7/18/2011	5.1 ± 0.2	0.0005	23.732 ± 0.931	0.002		51.828972	-176.448305
Greenling - whole	GREN-AN-ANT1-1	FAUNA	7/19/2011	0.135 ± 0.004	0.0004	0.599 ± 0.018	0.002		51.835694	-176.542138
	GREN-AN-ANT1-2	FAUNA	7/19/2011	0.066 ± 0.004	0.0004	0.276 ± 0.017	0.002		51.835694	-176.542138
	GREN-AN-ANT1-3	FAUNA	7/19/2011	0.276 ± 0.01	0.0004	1.005 ± 0.036	0.001		51.835694	-176.542138
	GREN-AN-ANT2-1	FAUNA	7/18/2011	0.31 ± 0.02	0.0005	1.434 ± 0.093	0.002		51.848361	-176.506277
	GREN-AN-ANT2-2	FAUNA	7/18/2011	0.173 ± 0.004	0.0003	0.802 ± 0.019	0.001		51.848361	-176.506277
	GREN-AN-ANT2-3	FAUNA	7/18/2011	0.148 ± 0.004	0.0004	0.702 ± 0.019	0.002		51.848361	-176.506277
	GREN-AN-ANT3-1	FAUNA	7/17/2011	0.151 ± 0.006	0.0004	0.689 ± 0.027	0.002		51.853722	-176.470694
	GREN-AN-ANT3-2	FAUNA	7/17/2011	0.061 ± 0.002	0.0003	0.283 ± 0.009	0.001		51.853722	-176.470694
	GREN-AN-ANT3-3	FAUNA	7/17/2011	0.139 ± 0.006	0.0003	0.647 ± 0.028	0.001		51.853722	-176.470694
	GREN-AN-DUP	FAUNA	7/17/2011	0.122 ± 0.004	0.0004	0.581 ± 0.019	0.002		51.853722	-176.470694
Halibut - whole	HALI-AN-AN2M-1	FAUNA	7/17/2011	0.037 ± 0.002	0.0004	0.124 ± 0.007	0.001		51.853722	-176.470694
	HALI-AN-DUP	FAUNA	7/17/2011	0.035 ± 0.004	0.0005	0.116 ± 0.013	0.002		51.853722	-176.470694
Horse Mussel - soft tissue only	HMUS-AN-ANT1-1	FAUNA	7/20/2011	0.813 ± 0.008	0.0003	4.445 ± 0.044	0.002		51.838722	-176.582805
	HMUS-AN-ANT2-1	FAUNA	7/18/2011	1.75 ± 0.06	0.0004	8.036 ± 0.276	0.002		51.848361	-176.506277
	HMUS-AN-ANT3-1	FAUNA	7/18/2011	0.292 ± 0.006	0.0002	1.301 ± 0.027	0.001		51.853722	-176.470694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Irish Lord - whole	IRLO-AN-ANT1-1	FAUNA	7/19/2011	0.161 ± 0.002	0.0004	0.756 ± 0.009	0.002		51.835694	-176.542138
	IRLO-AN-ANT1-2	FAUNA	7/19/2011	0.097 ± 0.006	0.0004	0.431 ± 0.027	0.002		51.835694	-176.542138
	IRLO-AN-ANT1-3	FAUNA	7/19/2011	0.136 ± 0.006	0.0004	0.598 ± 0.026	0.002		51.835694	-176.542138
	IRLO-AN-ANT2-1	FAUNA	7/19/2011	0.123 ± 0.004	0.0004	0.583 ± 0.019	0.002		51.848361	-176.506277
	IRLO-AN-ANT2-2	FAUNA	7/19/2011	0.144 ± 0.004	0.0004	0.667 ± 0.019	0.002		51.848361	-176.506277
	IRLO-AN-ANT2-3	FAUNA	7/19/2011	0.43 ± 0.02	0.0004	2.05 ± 0.095	0.002		51.848361	-176.506277
	IRLO-AN-ANT3-1	FAUNA	7/17/2011	0.256 ± 0.008	0.0005	1.228 ± 0.038	0.002		51.853722	-176.470694
	IRLO-AN-ANT3-2	FAUNA	7/17/2011	0.062 ± 0.004	0.0005	0.28 ± 0.018	0.002		51.853722	-176.470694
	IRLO-AN-ANT3-3	FAUNA	7/17/2011	0.113 ± 0.004	0.0004	0.508 ± 0.018	0.002		51.853722	-176.470694
Octopus	OCTP-AN-AN2M-1	FAUNA	7/18/2011	0.45 ± 0.02	0.0004	2.277 ± 0.101	0.002		51.848361	-176.506277
Pacific Cod - whole	PCOD-AN-AN2M-1	FAUNA	7/17/2011	0.05 ± 0.002	0.0002	0.243 ± 0.01	0.001		51.853722	-176.470694
Rockfish - whole	ROCK-AN-ANT1-1	FAUNA	7/19/2011	0.48 ± 0.02	0.0004	1.776 ± 0.074	0.001		51.835694	-176.542138
	ROCK-AN-ANT2-1	FAUNA	7/18/2011	0.05 ± 0.004	0.0002	0.183 ± 0.015	0.001		51.848361	-176.506277
	ROCK-AN-ANT2-2	FAUNA	7/18/2011	0.046 ± 0.002	0.0003	0.188 ± 0.008	0.001		51.848361	-176.506277
	ROCK-AN-ANT3-1	FAUNA	7/17/2011	0.107 ± 0.004	0.0002	0.381 ± 0.014	0.001		51.853722	-176.470694
	ROCK-AN-ANT3-2	FAUNA	7/17/2011	0.041 ± 0.004	0.0004	0.158 ± 0.015	0.002		51.853722	-176.470694
	ROCK-AN-ANT3-3	FAUNA	7/17/2011	0.083 ± 0.004	0.0004	0.326 ± 0.016	0.002		51.853722	-176.470694
Sea Urchin - whole	URCH-AN-ANT1-1	FAUNA	7/19/2011	0.2 ± 0.02	0.0005	0.682 ± 0.068	0.002		51.835694	-176.542138
	URCH-AN-ANT2-1	FAUNA	7/18/2011	0.56 ± 0.02	0.0005	2.04 ± 0.073	0.002		51.848361	-176.506277
	URCH-AN-ANT3-1	FAUNA	7/17/2011	0.61 ± 0.02	0.0005	2.319 ± 0.076	0.002		51.853722	-176.470694
Amchitka Site (Adak Island South) (AMC15)										
Chiton	CHIT-AS-AST1-1	FAUNA	7/15/2011	0.94 ± 0.02	0.0004	3.863 ± 0.082	0.002		51.737472	-176.48025
	CHIT-AS-AST2-1	FAUNA	7/16/2011	0.153 ± 0.004	0.0004	0.783 ± 0.02	0.002		51.745666	-176.507055
	CHIT-AS-AST3-1	FAUNA	7/14/2011	0.99 ± 0.04	0.0004	4.664 ± 0.188	0.002		51.688333	-176.63375
Dragon Kelp	EUAL-AS-AST1-1	VEG	7/15/2011	0.9 ± 0.02	0.0003	5.931 ± 0.132	0.002		51.737472	-176.48025
	EUAL-AS-AST1-2	VEG	7/15/2011	0.638 ± 0.01	0.0004	5.081 ± 0.08	0.003		51.737472	-176.48025
	EUAL-AS-AST1-3	VEG	7/15/2011	0.32 ± 0.02	0.0004	3.071 ± 0.192	0.004		51.737472	-176.48025
	EUAL-AS-AST2-1	VEG	7/16/2011	0.56 ± 0.02	0.0005	3.981 ± 0.142	0.004		51.745666	-176.507055
	EUAL-AS-AST2-2	VEG	7/16/2011	0.721 ± 0.006	0.0003	5.102 ± 0.042	0.002		51.745666	-176.507055
	EUAL-AS-AST2-3	VEG	7/16/2011	1.08 ± 0.04	0.0005	7.846 ± 0.291	0.004		51.745666	-176.507055
	EUAL-AS-AST3-1	VEG	7/14/2011	0.88 ± 0.02	0.0003	6.428 ± 0.146	0.002		51.688333	-176.63375
	EUAL-AS-AST3-2	VEG	7/14/2011	0.33 ± 0.02	0.0004	3.128 ± 0.19	0.004		51.688333	-176.63375
	EUAL-AS-AST3-3	VEG	7/14/2011	0.46 ± 0.02	0.0003	4.056 ± 0.176	0.003		51.688333	-176.63375
	EUAL-AS-DUP	VEG	7/14/2011	0.05 ± 0.002	0.00005	0.368 ± 0.015	0		51.688333	-176.63375

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockweed	FUCU-AS-AST1-1	VEG	7/16/2011	2.24 ± 0.08	0.0004	13.818 ± 0.493	0.002		51.733666	-176.470805
	FUCU-AS-AST1-2	VEG	7/16/2011	2.03 ± 0.06	0.0004	11.26 ± 0.333	0.002		51.733666	-176.470805
	FUCU-AS-AST1-3	VEG	7/16/2011	3.04 ± 0.08	0.0004	16.5 ± 0.434	0.002		51.733666	-176.470805
	FUCU-AS-AST2-1	VEG	7/16/2011	2.59 ± 0.06	0.0004	12.519 ± 0.29	0.002		51.745666	-176.507055
	FUCU-AS-AST2-2	VEG	7/16/2011	3.25 ± 0.06	0.0004	16.451 ± 0.304	0.002		51.745666	-176.507055
	FUCU-AS-AST2-3	VEG	7/16/2011	3.01 ± 0.06	0.0005	14.787 ± 0.295	0.002		51.745666	-176.507055
	FUCU-AS-AST3-1	VEG	7/14/2011	2.53 ± 0.06	0.0004	13.337 ± 0.316	0.002		51.688333	-176.63375
	FUCU-AS-AST3-2	VEG	7/14/2011	1.93 ± 0.08	0.0004	9.504 ± 0.394	0.002		51.688333	-176.63375
	FUCU-AS-AST3-3	VEG	7/14/2011	1.65 ± 0.04	0.0003	8.665 ± 0.21	0.002		51.688333	-176.63375
	FUCU-AS-DUP	VEG	7/16/2011	4.01 ± 0.04	0.0003	20.725 ± 0.207	0.002		51.733666	-176.470805
Greenling - whole	GREN-AS-AST1-1	FAUNA	7/15/2011	0.291 ± 0.01	0.0004	1.386 ± 0.048	0.002		51.737472	-176.48025
	GREN-AS-AST1-2	FAUNA	7/15/2011	0.123 ± 0.004	0.0003	0.58 ± 0.019	0.001		51.737472	-176.48025
	GREN-AS-AST1-3	FAUNA	7/15/2011	0.149 ± 0.004	0.0003	0.716 ± 0.019	0.001		51.737472	-176.48025
	GREN-AS-AST2-1	FAUNA	7/16/2011	0.048 ± 0.002	0.0002	0.193 ± 0.008	0.001		51.745666	-176.507055
	GREN-AS-AST2-2	FAUNA	7/16/2011	0.2 ± 0.01	0.0004	0.915 ± 0.046	0.002		51.745666	-176.507055
	GREN-AS-AST2-3	FAUNA	7/16/2011	0.125 ± 0.006	0.0004	0.582 ± 0.028	0.002		51.745666	-176.507055
	GREN-AS-AST3-1	FAUNA	7/14/2011	0.093 ± 0.004	0.0003	0.443 ± 0.019	0.001		51.688333	-176.63375
	GREN-AS-AST3-2	FAUNA	7/14/2011	0.201 ± 0.008	0.0003	0.946 ± 0.038	0.001		51.688333	-176.63375
	GREN-AS-AST3-3	FAUNA	7/14/2011	0.197 ± 0.006	0.0004	0.941 ± 0.029	0.002		51.688333	-176.63375
	GREN-AS-DUP	FAUNA	7/14/2011	0.26 ± 0.02	0.0004	1.304 ± 0.1	0.002		51.688333	-176.63375
Horse Mussel - soft tissue only	HMUS-AS-AST1-1	FAUNA	7/15/2011	1.16 ± 0.02	0.0003	5.812 ± 0.1	0.002		51.737472	-176.48025
	HMUS-AS-AST2-1	FAUNA	7/16/2011	0.55 ± 0.02	0.0003	3.489 ± 0.127	0.002		51.745666	-176.507055
	HMUS-AS-AST3-1	FAUNA	7/14/2011	1.6 ± 0.04	0.0003	8.157 ± 0.204	0.002		51.688333	-176.63375
Irish Lord - whole	IRLO-AS-AST1-1	FAUNA	7/15/2011	0.23 ± 0.02	0.0004	1.013 ± 0.088	0.002		51.737472	-176.48025
	IRLO-AS-AST1-2	FAUNA	7/15/2011	0.164 ± 0.004	0.0004	0.765 ± 0.019	0.002		51.737472	-176.48025
	IRLO-AS-AST1-3	FAUNA	7/15/2011	0.406 ± 0.008	0.0004	1.851 ± 0.036	0.002		51.737472	-176.48025
	IRLO-AS-AST2-1	FAUNA	7/16/2011	0.55 ± 0.01	0.0004	2.574 ± 0.047	0.002		51.745666	-176.507055
	IRLO-AS-AST2-2	FAUNA	7/16/2011	0.166 ± 0.006	0.0005	0.707 ± 0.026	0.002		51.745666	-176.507055
	IRLO-AS-AST2-3	FAUNA	7/16/2011	0.416 ± 0.008	0.0004	2.105 ± 0.04	0.002		51.745666	-176.507055
	IRLO-AS-AST3-1	FAUNA	7/14/2011	0.202 ± 0.008	0.0004	0.907 ± 0.036	0.002		51.688333	-176.63375
	IRLO-AS-AST3-2	FAUNA	7/14/2011	0.076 ± 0.004	0.0005	0.321 ± 0.017	0.002		51.688333	-176.63375
	IRLO-AS-AST3-3	FAUNA	7/14/2011	0.142 ± 0.008	0.0004	0.648 ± 0.037	0.002		51.688333	-176.63375
Pacific Cod - whole	PCOD-AS-AS2M-1	FAUNA	7/15/2011	0.06 ± 0.004	0.0003	0.3 ± 0.02	0.002		51.737472	-176.48025

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockfish - whole	ROCK-AS-AST1-1	FAUNA	7/15/2011	0.152 ± 0.008	0.0004	0.546 ± 0.029	0.001		51.737472	-176.48025
	ROCK-AS-AST1-2	FAUNA	7/15/2011	0.094 ± 0.004	0.0004	0.352 ± 0.015	0.001		51.737472	-176.48025
	ROCK-AS-AST1-3	FAUNA	7/15/2011	0.167 ± 0.004	0.0004	0.719 ± 0.017	0.002		51.737472	-176.48025
	ROCK-AS-AST2-1	FAUNA	7/16/2011	0.23 ± 0.02	0.0004	0.882 ± 0.077	0.002		51.745666	-176.507055
	ROCK-AS-AST2-2	FAUNA	7/16/2011	0.047 ± 0.002	0.0004	0.175 ± 0.007	0.001		51.745666	-176.507055
	ROCK-AS-AST2-3	FAUNA	7/16/2011	0.156 ± 0.008	0.0004	0.602 ± 0.031	0.002		51.745666	-176.507055
	ROCK-AS-AST3-1	FAUNA	7/14/2011	0.384 ± 0.01	0.0007	1.574 ± 0.041	0.003		51.688333	-176.63375
	ROCK-AS-AST3-2	FAUNA	7/14/2011	0.38 ± 0.02	0.0005	1.611 ± 0.085	0.002		51.688333	-176.63375
	ROCK-AS-AST3-3	FAUNA	7/14/2011	0.113 ± 0.004	0.0003	0.49 ± 0.017	0.001		51.688333	-176.63375
	ROCK-AS-DUP	FAUNA	7/14/2011	0.068 ± 0.006	0.0004	0.266 ± 0.023	0.002		51.688333	-176.63375
Sea Urchin - whole	URCH-AS-AST1-1	FAUNA	7/15/2011	0.72 ± 0.02	0.0005	2.735 ± 0.076	0.002		51.737472	-176.48025
	URCH-AS-AST2-1	FAUNA	7/16/2011	0.83 ± 0.02	0.0005	3.351 ± 0.081	0.002		51.745666	-176.507055
	URCH-AS-AST3-1	FAUNA	7/14/2011	0.75 ± 0.04	0.0005	2.801 ± 0.149	0.002		51.688333	-176.63375
^{238}Uranium (pCi/kg)										
Amchitka Site (AMC01)										
Dolly Varden - whole	DOLL-AI-XXX-1	FAUNA	6/24/2011	0.234 ± 0.004	0.002	0.902 ± 0.015	0.008		51.468283	179.108052
Goose Egg - no shell	GOOS-AI-XXX-1	FAUNA	6/24/2011	0.015 ± 0.01	0.003	0.04 ± 0.027	0.008		51.491305	179.0595
Glaucous-winged Gull Egg - no shell	GWGU-AI-XXX-1	FAUNA	6/24/2011	0.015 ± 0.004	0.001	0.052 ± 0.014	0.003		51.456388	179.167
Amchitka Site (Long Shot) (AMC02)										
Chiton	CHIT-LS-LT1-1	FAUNA	7/4/2011	2.88 ± 0.06	0.001	14.286 ± 0.298	0.005		51.457555	179.195138
	CHIT-LS-LT2-1	FAUNA	7/3/2011	21.49 ± 0.04	0.002	100.666 ± 0.187	0.009		51.44925	179.205583
	CHIT-LS-LT3-1	FAUNA	7/3/2011	16.6 ± 0.2	0.002	79.04 ± 0.952	0.01		51.43	179.22667
Dragon Kelp	EUAL-LS-DUP	VEG	7/3/2011	21.4 ± 0.6	0.002	128.522 ± 3.603	0.012		51.44925	179.205583
	EUAL-LS-LT1-1	VEG	7/4/2011	11.9 ± 0.2	0.001	111.191 ± 1.869	0.009		51.457555	179.195138
	EUAL-LS-LT1-2	VEG	7/4/2011	26.6 ± 0.2	0.001	165.362 ± 1.243	0.006		51.457555	179.195138
	EUAL-LS-LT1-3	VEG	7/4/2011	25.8 ± 0.8	0.002	155.763 ± 4.83	0.012		51.457555	179.195138
	EUAL-LS-LT2-1	VEG	7/3/2011	23.3 ± 0.6	0.002	140.94 ± 3.629	0.012		51.44925	179.205583
	EUAL-LS-LT2-2	VEG	7/3/2011	9.58 ± 0.08	0.001	69.553 ± 0.581	0.007		51.44925	179.205583
	EUAL-LS-LT2-3	VEG	7/3/2011	13.7 ± 0.4	0.002	99.099 ± 2.893	0.014		51.44925	179.205583
	EUAL-LS-LT3-1	VEG	7/2/2011	28.2 ± 0.4	0.002	179.98 ± 2.553	0.013		51.43	179.22667
	EUAL-LS-LT3-2	VEG	7/2/2011	35.4 ± 0.2	0.002	251.896 ± 1.423	0.014		51.43	179.22667
	EUAL-LS-LT3-3	VEG	7/2/2011	9.9 ± 0.2	0.002	83.506 ± 1.687	0.017		51.43	179.22667

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockweed	FUCU-LS-DUP	VEG	6/22/2011	55.5 ± 0.6	0.001	304.998 ± 3.297	0.005		51.447472	179.190888
	FUCU-LS-LT1-1	VEG	6/22/2011	73.6 ± 0.6	0.001	397.602 ± 3.241	0.005		51.447527	179.189361
	FUCU-LS-LT1-2	VEG	6/22/2011	62 ± 2	0.002	379.27 ± 12.235	0.012		51.447527	179.189361
	FUCU-LS-LT1-3	VEG	6/22/2011	50.4 ± 1	0.002	335.112 ± 6.649	0.013		51.448777	179.189305
	FUCU-LS-LT2-1	VEG	6/22/2011	29 ± 0.2	0.001	228.656 ± 1.577	0.008		51.447222	179.199361
	FUCU-LS-LT2-2	VEG	6/22/2011	47 ± 0.4	0.001	340.671 ± 2.899	0.007		51.44625	179.196972
	FUCU-LS-LT2-3	VEG	6/22/2011	60.5 ± 0.6	0.001	369.998 ± 3.669	0.006		51.446722	179.191888
	FUCU-LS-LT3-1	VEG	7/2/2011	74.1 ± 0.8	0.002	358.922 ± 3.875	0.01		51.433611	179.219305
	FUCU-LS-LT3-2	VEG	7/2/2011	55 ± 2	0.002	250.28 ± 9.101	0.009		51.430166	179.218694
	FUCU-LS-LT3-3	VEG	7/2/2011	80 ± 2	0.002	293.15 ± 7.329	0.007		51.430166	179.218694
Greenling - whole	GREN-LS-DUP	FAUNA	7/12/2011	6.74 ± 0.06	0.002	32.728 ± 0.291	0.01		51.434527	179.234416
	GREN-LS-LT1-1	FAUNA	7/4/2011	2.45 ± 0.06	0.001	11.548 ± 0.283	0.005		51.457555	179.195138
	GREN-LS-LT1-2	FAUNA	7/4/2011	1.76 ± 0.04	0.001	8.331 ± 0.189	0.005		51.457555	179.195138
	GREN-LS-LT1-3	FAUNA	7/5/2011	3.12 ± 0.04	0.002	14.612 ± 0.187	0.009		51.457555	179.195138
	GREN-LS-LT2-1	FAUNA	7/3/2011	6.2 ± 0.2	0.002	29.959 ± 0.966	0.01		51.432194	179.230277
	GREN-LS-LT2-2	FAUNA	7/3/2011	3.36 ± 0.06	0.001	15.496 ± 0.277	0.005		51.432194	179.230277
	GREN-LS-LT2-3	FAUNA	7/3/2011	4.77 ± 0.04	0.001	22.697 ± 0.19	0.005		51.432194	179.230277
	GREN-LS-LT3-1	FAUNA	7/3/2011	3.84 ± 0.04	0.002	17.045 ± 0.178	0.009		51.43	179.22667
	GREN-LS-LT3-2	FAUNA	7/12/2011	5.93 ± 0.1	0.002	29.091 ± 0.491	0.01		51.434527	179.234416
	GREN-LS-LT3-3	FAUNA	7/12/2011	4.8 ± 0.2	0.002	23.209 ± 0.967	0.01		51.434527	179.234416
Halibut - whole	HALI-LS-L2M-1	FAUNA	7/13/2011	0.254 ± 0.006	0.001	0.975 ± 0.023	0.004		51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-LS-LT1-1	FAUNA	7/5/2011	67.1 ± 1.2	0.002	287.454 ± 5.141	0.009		51.457555	179.195138
	HMUS-LS-LT2-1	FAUNA	7/4/2011	33.1 ± 0.2	0.002	135.224 ± 0.817	0.008		51.44925	179.205583
	HMUS-LS-LT3-1	FAUNA	7/3/2011	12.2 ± 0.6	0.043	25.586 ± 1.258	0.09		51.44925	179.205583
Irish Lord - whole	IRLO-LS-LT1-1	FAUNA	7/4/2011	2.22 ± 0.02	0.002	10.469 ± 0.094	0.009		51.457555	179.195138
	IRLO-LS-LT1-2	FAUNA	7/4/2011	1.99 ± 0.04	0.002	9.415 ± 0.189	0.009		51.457555	179.195138
	IRLO-LS-LT1-3	FAUNA	7/5/2011	4.2 ± 0.02	0.002	22.271 ± 0.106	0.011		51.457555	179.195138
	IRLO-LS-LT2-1	FAUNA	7/3/2011	9.83 ± 0.08	0.002	42.543 ± 0.346	0.009		51.432194	179.230277
	IRLO-LS-LT2-2	FAUNA	7/3/2011	7.74 ± 0.04	0.002	32.067 ± 0.166	0.008		51.432194	179.230277
	IRLO-LS-LT2-3	FAUNA	7/3/2011	16.1 ± 0.2	0.003	71.321 ± 0.886	0.013		51.432194	179.230277
	IRLO-LS-LT3-1	FAUNA	7/2/2011	8.5 ± 0.2	0.002	37.912 ± 0.892	0.009		51.43	179.22667
	IRLO-LS-LT3-2	FAUNA	7/12/2011	6.24 ± 0.08	0.001	29.604 ± 0.38	0.005		51.434944	179.2315
	IRLO-LS-LT3-3	FAUNA	7/12/2011	5.39 ± 0.04	0.001	29.779 ± 0.221	0.006		51.434944	179.2315
Octopus	OCTP-LS-L2M-1	FAUNA	7/3/2011	18.1 ± 0.2	0.001	129.002 ± 1.425	0.007		51.44925	179.205583
Pacific Cod - whole	PCOD-LS-L2M-1	FAUNA	7/4/2011	1.84 ± 0.02	0.001	9.156 ± 0.1	0.005		51.451805	179.196972

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockfish - whole	ROCK-LS-DUP	FAUNA	7/12/2011	3.95 ± 0.06	0.002	15.404 ± 0.234	0.008		51.434944	179.2315
	ROCK-LS-DUP2	FAUNA	7/12/2011	12.21 ± 0.06	0.002	52.25 ± 0.257	0.009		51.465472	179.206722
	ROCK-LS-LT1-1	FAUNA	7/4/2011	5.5 ± 0.2	0.002	25.541 ± 0.929	0.009		51.457555	179.195138
	ROCK-LS-LT1-2	FAUNA	7/12/2011	5.15 ± 0.04	0.002	21.273 ± 0.165	0.008		51.465472	179.206722
	ROCK-LS-LT1-3	FAUNA	7/12/2011	3.16 ± 0.06	0.002	13.042 ± 0.248	0.008		51.465472	179.206722
	ROCK-LS-LT2-1	FAUNA	7/4/2011	11.3 ± 0.2	0.002	45.321 ± 0.802	0.008		51.44925	179.205583
	ROCK-LS-LT2-2	FAUNA	7/12/2011	10.6 ± 0.2	0.002	41.831 ± 0.789	0.008		51.44625	179.223416
	ROCK-LS-LT3-1	FAUNA	7/12/2011	13.64 ± 0.06	0.002	60.032 ± 0.264	0.009		51.434944	179.2315
	ROCK-LS-LT3-2	FAUNA	7/12/2011	7.58 ± 0.06	0.002	32.157 ± 0.255	0.008		51.434944	179.2315
	ROCK-LS-LT3-3	FAUNA	7/3/2011	6.6 ± 0.2	0.002	22.771 ± 0.69	0.007		51.43	179.22667
Reindeer Lichen	STRL-AI-LT1-2	VEG	6/22/2011	2.72 ± 0.04	0.001	8.246 ± 0.121	0.003		51.447361	179.189111
Sea Urchin - whole	URCH-LS-LT1-1	FAUNA	7/4/2011	18.4 ± 0.2	0.002	71.878 ± 0.781	0.008		51.457555	179.195138
	URCH-LS-LT2-1	FAUNA	7/3/2011	15.8 ± 0.2	0.002	60.705 ± 0.768	0.008		51.44925	179.205583
	URCH-LS-LT3-1	FAUNA	7/2/2011	19.1 ± 0.2	0.002	74.398 ± 0.779	0.008		51.43	179.22667
Amchitka Site (Milrow) (AMC03)										
Chiton	CHIT-ML-MT1-1	FAUNA	7/9/2011	14.6 ± 0.2	0.002	55.055 ± 0.754	0.008		51.408472	179.139166
	CHIT-ML-MT2-1	FAUNA	7/10/2011	21.7 ± 0.4	0.002	100.758 ± 1.857	0.009		51.389416	179.173138
	CHIT-ML-MT3-1	FAUNA	7/10/2011	20.9 ± 0.4	0.002	94.839 ± 1.815	0.009		51.387805	179.184
Dragon Kelp	EUAL-ML-DUP	VEG	7/9/2011	15 ± 0.4	0.002	113.036 ± 3.014	0.015		51.408472	179.139166
	EUAL-ML-MT1-1	VEG	7/9/2011	14.9 ± 0.2	0.001	119.111 ± 1.599	0.008		51.408472	179.139166
	EUAL-ML-MT1-2	VEG	7/9/2011	18.7 ± 0.6	0.002	139.145 ± 4.465	0.015		51.408472	179.139166
	EUAL-ML-MT1-3	VEG	7/9/2011	11.7 ± 0.2	0.001	98.416 ± 1.682	0.008		51.408472	179.139166
	EUAL-ML-MT2-1	VEG	7/10/2011	33.3 ± 0.4	0.003	248.184 ± 2.981	0.022		51.389416	179.173138
	EUAL-ML-MT2-2	VEG	7/10/2011	22.9 ± 0.8	0.001	162.251 ± 5.668	0.007		51.389416	179.173138
	EUAL-ML-MT2-3	VEG	7/10/2011	18.09 ± 0.08	0.001	136.358 ± 0.603	0.008		51.389416	179.173138
	EUAL-ML-MT3-1	VEG	7/10/2011	17.3 ± 0.4	0.002	121.691 ± 2.814	0.014		51.387805	179.184
	EUAL-ML-MT3-2	VEG	7/10/2011	18.1 ± 0.8	0.002	132.236 ± 5.845	0.015		51.387805	179.184
	EUAL-ML-MT3-3	VEG	7/10/2011	33 ± 0.8	0.002	227.574 ± 5.517	0.014		51.387805	179.184

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockweed	FUCU-ML-DUP	VEG	6/20/2011	85.2 ± 1	0.002	369.693 ± 4.339	0.009		51.412449	179.160843
	FUCU-ML-MT1-1	VEG	6/20/2011	79.9 ± 0.4	0.002	332.868 ± 1.666	0.008		51.412449	179.160843
	FUCU-ML-MT1-2	VEG	6/21/2011	74.6 ± 0.8	0.001	452.543 ± 4.853	0.006		51.417083	179.134083
	FUCU-ML-MT1-3	VEG	7/9/2011	89 ± 4	0.002	409.092 ± 18.386	0.009		51.417083	179.134083
	FUCU-ML-MT2-1	VEG	6/20/2011	76.4 ± 0.6	0.002	394.288 ± 3.097	0.01		51.403305	179.167166
	FUCU-ML-MT2-2	VEG	6/21/2011	46 ± 2	0.001	323.175 ± 14.051	0.007		51.405694	179.161361
	FUCU-ML-MT2-3	VEG	6/21/2011	43.7 ± 0.2	0.001	303.437 ± 1.389	0.007		51.405694	179.161361
	FUCU-ML-MT3-1	VEG	7/10/2011	114 ± 2	0.002	553.613 ± 9.713	0.01		51.389416	179.173138
	FUCU-ML-MT3-2	VEG	7/10/2011	121 ± 2	0.002	581.118 ± 9.605	0.01		51.389416	179.173138
	FUCU-ML-MT3-3	VEG	7/10/2011	108 ± 2	0.002	545.248 ± 10.097	0.01		51.389416	179.173138
Greenling - whole	GREN-ML-DUP	FAUNA	7/10/2011	4.99 ± 0.06	0.001	24.197 ± 0.291	0.005		51.387805	179.184
	GREN-ML-MT1-1	FAUNA	7/9/2011	4.53 ± 0.06	0.002	19.732 ± 0.261	0.009		51.408472	179.139166
	GREN-ML-MT1-2	FAUNA	7/9/2011	5.62 ± 0.04	0.002	26.022 ± 0.185	0.009		51.408472	179.139166
	GREN-ML-MT1-3	FAUNA	7/9/2011	9.1 ± 0.2	0.001	43.94 ± 0.966	0.005		51.408472	179.139166
	GREN-ML-MT2-1	FAUNA	7/11/2011	2.74 ± 0.06	0.002	12.773 ± 0.28	0.009		51.396944	179.1435
	GREN-ML-MT2-2	FAUNA	7/11/2011	3.92 ± 0.04	0.002	18.351 ± 0.187	0.009		51.396944	179.1435
	GREN-ML-MT2-3	FAUNA	7/11/2011	2.8 ± 0.2	0.001	13.37 ± 0.955	0.005		51.396944	179.1435
	GREN-ML-MT3-1	FAUNA	7/10/2011	8.4 ± 0.2	0.002	40.738 ± 0.97	0.01		51.387805	179.184
	GREN-ML-MT3-2	FAUNA	7/10/2011	2.61 ± 0.02	0.002	12.593 ± 0.096	0.01		51.387805	179.184
	GREN-ML-MT3-3	FAUNA	7/10/2011	4.41 ± 0.08	0.001	20.894 ± 0.379	0.005		51.387805	179.184
Halibut - whole	HALI-ML-M2M-1	FAUNA	7/11/2011	0.65 ± 0.02	0.002	2.258 ± 0.069	0.007		51.365055	179.111472
Horse Mussel - soft tissue only	HMUS-ML-MT1-1	FAUNA	7/9/2011	58.4 ± 0.6	0.002	265.566 ± 2.728	0.009		51.408472	179.139166
	HMUS-ML-MT2-1	FAUNA	7/11/2011	34.5 ± 0.2	0.002	155.163 ± 0.899	0.009		51.389416	179.173138
	HMUS-ML-MT3-1	FAUNA	7/10/2011	38.2 ± 0.4	0.002	175.359 ± 1.836	0.009		51.387805	179.184
Irish Lord - whole	IRLO-ML-MT1-1	FAUNA	7/9/2011	4.28 ± 0.04	0.002	18.272 ± 0.171	0.009		51.408472	179.139166
	IRLO-ML-MT1-2	FAUNA	7/9/2011	2.69 ± 0.02	0.002	12.758 ± 0.095	0.009		51.408472	179.139166
	IRLO-ML-MT1-3	FAUNA	7/9/2011	2.21 ± 0.04	0.002	10.353 ± 0.187	0.009		51.408472	179.139166
	IRLO-ML-MT2-1	FAUNA	7/10/2011	4.88 ± 0.04	0.002	21.028 ± 0.172	0.009		51.389416	179.173138
	IRLO-ML-MT2-2	FAUNA	7/11/2011	2.1 ± 0.04	0.003	9.048 ± 0.172	0.013		51.396944	179.1435
	IRLO-ML-MT2-3	FAUNA	7/11/2011	3.6 ± 0.04	0.002	17.077 ± 0.19	0.009		51.396944	179.1435
	IRLO-ML-MT3-1	FAUNA	7/10/2011	8.16 ± 0.06	0.001	46.001 ± 0.338	0.006		51.387805	179.184
	IRLO-ML-MT3-2	FAUNA	7/10/2011	4.44 ± 0.06	0.002	21.437 ± 0.29	0.01		51.387805	179.184
	IRLO-ML-MT3-3	FAUNA	7/10/2011	6.46 ± 0.08	0.001	36.214 ± 0.448	0.006		51.387805	179.184
Octopus	OCTP-ML-M2M-1	FAUNA	7/10/2011	8.52 ± 0.08	0.001	40.182 ± 0.377	0.005		51.389416	179.173138
Pacific Cod - whole	PCOD-ML-M2M-1	FAUNA	7/10/2011	2.11 ± 0.04	0.001	11.157 ± 0.212	0.005		51.408472	179.139166

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockfish - whole	ROCK-ML-DUP	FAUNA	7/9/2011	14.2 ± 0.2	0.002	62.776 ± 0.884	0.009		51.408472	179.139166
	ROCK-ML-MT1-1	FAUNA	7/9/2011	5.9 ± 0.2	0.001	25.971 ± 0.88	0.004		51.408472	179.139166
	ROCK-ML-MT1-2	FAUNA	7/9/2011	12.5 ± 0.2	0.002	54.867 ± 0.878	0.009		51.408472	179.139166
	ROCK-ML-MT1-3	FAUNA	7/9/2011	7.96 ± 0.08	0.002	33.695 ± 0.339	0.008		51.408472	179.139166
	ROCK-ML-MT2-1	FAUNA	7/11/2011	6.33 ± 0.16	0.002	23.758 ± 0.601	0.008		51.365055	179.111472
	ROCK-ML-MT2-2	FAUNA	7/11/2011	13.9 ± 0.2	0.002	56.246 ± 0.809	0.008		51.365055	179.111472
	ROCK-ML-MT2-3	FAUNA	7/11/2011	12.2 ± 0.2	0.001	54.962 ± 0.901	0.005		51.365055	179.111472
	ROCK-ML-MT3-1	FAUNA	7/10/2011	10.3 ± 0.2	0.002	48.606 ± 0.944	0.009		51.387805	179.184
	ROCK-ML-MT3-2	FAUNA	7/10/2011	3.11 ± 0.06	0.002	11.192 ± 0.216	0.007		51.387805	179.184
	ROCK-ML-MT3-3	FAUNA	7/10/2011	2.2 ± 0.04	0.003	5.119 ± 0.093	0.007		51.387805	179.184
Reindeer Lichen	STRL-AI-ML-1	VEG	6/21/2011	2.46 ± 0.06	0.002	8.804 ± 0.215	0.007		51.402583	179.183972
Sea Urchin - whole	URCH-ML-MT1-1	FAUNA	7/9/2011	19.5 ± 0.4	0.002	72.34 ± 1.484	0.007		51.408472	179.139166
	URCH-ML-MT2-1	FAUNA	7/10/2011	18.9 ± 0.2	0.002	70.586 ± 0.747	0.007		51.389416	179.173138
	URCH-ML-MT3-1	FAUNA	7/10/2011	17.7 ± 0.2	0.002	70.267 ± 0.794	0.008		51.387805	179.184
Amchitka Site (Cannikin) (AMC05)										
Chiton	CHIT-CN-CT1-1	FAUNA	7/8/2011	26.8 ± 0.4	0.002	125.518 ± 1.873	0.009		51.482972	179.123833
	CHIT-CN-CT2-1	FAUNA	7/7/2011	25.5 ± 0.6	0.002	120.678 ± 2.839	0.009		51.472611	179.151111
	CHIT-CN-CT3-1	FAUNA	7/5/2011	19.7 ± 0.2	0.002	96.695 ± 0.982	0.01		51.471416	179.172861
Dragon Kelp	EUAL-CN-CT1-1	VEG	7/8/2011	19.1 ± 0.4	0.001	141.382 ± 2.961	0.007		51.482972	179.123833
	EUAL-CN-CT1-2	VEG	7/8/2011	15.7 ± 0.4	0.001	102.36 ± 2.608	0.007		51.482972	179.123833
	EUAL-CN-CT1-3	VEG	7/8/2011	22.2 ± 0.2	0.001	135.978 ± 1.225	0.006		51.482972	179.123833
	EUAL-CN-CT2-1	VEG	7/6/2011	20 ± 0.6	0.001	127.558 ± 3.827	0.006		51.472611	179.151111
	EUAL-CN-CT2-2	VEG	7/6/2011	33 ± 2	0.002	207.124 ± 12.553	0.013		51.472611	179.151111
	EUAL-CN-CT2-3	VEG	7/7/2011	14.1 ± 0.2	0.001	102.225 ± 1.45	0.007		51.472611	179.151111
	EUAL-CN-CT3-1	VEG	7/5/2011	16.3 ± 0.2	0.001	113.66 ± 1.395	0.007		51.471416	179.172861
	EUAL-CN-CT3-2	VEG	7/5/2011	11.6 ± 0.2	0.002	83.4 ± 1.438	0.014		51.471416	179.172861
	EUAL-CN-CT3-3	VEG	7/5/2011	19.8 ± 0.2	0.001	128.689 ± 1.3	0.006		51.471416	179.172861
	EUAL-CN-DUP	VEG	7/6/2011	7.15 ± 0.04	0.001	47.509 ± 0.266	0.007		51.471416	179.172861

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockweed	FUCU-CN-CT1-1	VEG	6/23/2011	44.2 ± 0.2	0.001	254.898 ± 1.153	0.006		51.481888	179.118138
	FUCU-CN-CT1-2	VEG	6/23/2011	50 ± 0.8	0.002	314.903 ± 5.038	0.013		51.481888	179.118138
	FUCU-CN-CT1-3	VEG	6/23/2011	57.5 ± 0.8	0.002	338.971 ± 4.716	0.012		51.481888	179.118138
	FUCU-CN-CT2-1	VEG	7/8/2011	108 ± 2	0.002	446.307 ± 8.265	0.008		51.476638	179.135277
	FUCU-CN-CT2-2	VEG	7/8/2011	105 ± 2	0.002	465.906 ± 8.874	0.009		51.476638	179.135277
	FUCU-CN-CT2-3	VEG	7/12/2011	44 ± 2	0.002	232.584 ± 10.572	0.011		51.467583	179.153583
	FUCU-CN-CT3-1	VEG	7/6/2011	43.4 ± 1	0.002	233.866 ± 5.389	0.011		51.465027	179.173166
	FUCU-CN-CT3-2	VEG	7/6/2011	34.5 ± 0.8	0.002	202.502 ± 4.696	0.012		51.465472	179.170583
	FUCU-CN-CT3-3	VEG	7/6/2011	64 ± 2	0.002	406.145 ± 12.692	0.013		51.464638	179.159305
	FUCU-CN-DUP	VEG	6/23/2011	44.2 ± 0.4	0.001	285.166 ± 2.581	0.006		51.481888	179.118138
Greenling - whole	GREN-CN-CT1-1	FAUNA	7/8/2011	6.57 ± 0.12	0.001	31.671 ± 0.578	0.005		51.482972	179.123833
	GREN-CN-CT1-2	FAUNA	7/8/2011	5.73 ± 0.12	0.002	27.214 ± 0.57	0.009		51.482972	179.123833
	GREN-CN-CT1-3	FAUNA	7/8/2011	5.34 ± 0.1	0.002	24.334 ± 0.456	0.009		51.482972	179.123833
	GREN-CN-CT2-1	FAUNA	7/7/2011	6.49 ± 0.18	0.001	31.632 ± 0.877	0.005		51.472611	179.151111
	GREN-CN-CT2-2	FAUNA	7/7/2011	2.51 ± 0.02	0.002	11.517 ± 0.092	0.009		51.472611	179.151111
	GREN-CN-CT2-3	FAUNA	7/7/2011	4.3 ± 0.04	0.002	19.843 ± 0.185	0.009		51.472611	179.151111
	GREN-CN-CT3-1	FAUNA	7/5/2011	4.79 ± 0.06	0.002	21.83 ± 0.273	0.009		51.471416	179.172861
	GREN-CN-CT3-2	FAUNA	7/5/2011	7.9 ± 0.2	0.002	34.411 ± 0.871	0.009		51.471416	179.172861
	GREN-CN-CT3-3	FAUNA	7/5/2011	3.32 ± 0.04	0.002	15.245 ± 0.184	0.009		51.471416	179.172861
	GREN-CN-DUP	FAUNA	7/8/2011	4.45 ± 0.06	0.002	21.461 ± 0.289	0.01		51.482972	179.123833
Halibut - whole	HALI-CN-C2M-1	FAUNA	7/13/2011	0.204 ± 0.004	0.001	0.789 ± 0.015	0.004		51.40025	179.283361
Horse Mussel - soft tissue only	HMUS-CN-CT1-1	FAUNA	7/8/2011	20.2 ± 0.2	0.002	83.043 ± 0.822	0.008		51.482972	179.123833
	HMUS-CN-CT2-1	FAUNA	7/7/2011	54.1 ± 0.4	0.002	245.15 ± 1.813	0.009		51.472611	179.151111
	HMUS-CN-CT3-1	FAUNA	7/5/2011	41.9 ± 0.6	0.002	171.88 ± 2.461	0.008		51.471416	179.172861
Irish Lord - whole	IRLO-CN-CT1-1	FAUNA	7/8/2011	4.07 ± 0.04	0.002	18.342 ± 0.18	0.009		51.482972	179.123833
	IRLO-CN-CT1-2	FAUNA	7/8/2011	10.1 ± 0.2	0.002	50.623 ± 1.002	0.01		51.482972	179.123833
	IRLO-CN-CT1-3	FAUNA	7/8/2011	7.94 ± 0.06	0.002	37.299 ± 0.282	0.009		51.482972	179.123833
	IRLO-CN-CT2-1	FAUNA	7/7/2011	6.33 ± 0.04	0.002	29.831 ± 0.189	0.009		51.472611	179.151111
	IRLO-CN-CT2-2	FAUNA	7/7/2011	8.8 ± 0.1	0.002	40.206 ± 0.457	0.009		51.472611	179.151111
	IRLO-CN-CT2-3	FAUNA	7/7/2011	4.16 ± 0.04	0.002	20.475 ± 0.197	0.01		51.472611	179.151111
	IRLO-CN-CT3-1	FAUNA	7/5/2011	5.57 ± 0.06	0.001	28.699 ± 0.309	0.005		51.471416	179.172861
	IRLO-CN-CT3-2	FAUNA	7/5/2011	3.91 ± 0.02	0.001	18.957 ± 0.097	0.005		51.471416	179.172861
	IRLO-CN-CT3-3	FAUNA	7/5/2011	2.68 ± 0.02	0.002	12.848 ± 0.096	0.01		51.471416	179.172861
Octopus	OCTP-CN-C2M-1	FAUNA	7/8/2011	9.27 ± 0.06	0.001	45.431 ± 0.294	0.005		51.482972	179.123833
Pacific Cod - whole	PCOD-CN-C2M-1	FAUNA	7/6/2011	0.79 ± 0.02	0.001	3.617 ± 0.092	0.005		51.483527	179.187583

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockfish - whole	ROCK-CN-CT1-1	FAUNA	7/8/2011	1.93 ± 0.06	0.002	7.625 ± 0.237	0.008		51.482972	179.123833
	ROCK-CN-CT1-2	FAUNA	7/8/2011	3.33 ± 0.12	0.002	12.843 ± 0.463	0.008		51.482972	179.123833
	ROCK-CN-CT1-3	FAUNA	7/8/2011	8.16 ± 0.04	0.002	32.79 ± 0.161	0.008		51.482972	179.123833
	ROCK-CN-CT2-1	FAUNA	7/6/2011	3.2 ± 0.04	0.002	11.302 ± 0.141	0.007		51.472611	179.151111
	ROCK-CN-CT2-2	FAUNA	7/6/2011	5.36 ± 0.06	0.002	19.622 ± 0.22	0.007		51.472611	179.151111
	ROCK-CN-CT2-3	FAUNA	7/6/2011	5.61 ± 0.12	0.002	22.948 ± 0.491	0.008		51.472611	179.151111
	ROCK-CN-CT3-1	FAUNA	7/6/2011	5.51 ± 0.04	0.002	23.531 ± 0.171	0.009		51.471416	179.172861
	ROCK-CN-CT3-2	FAUNA	7/6/2011	5.4 ± 0.1	0.002	20.749 ± 0.384	0.008		51.471416	179.172861
	ROCK-CN-CT3-3	FAUNA	7/6/2011	7.92 ± 0.16	0.002	33.1 ± 0.669	0.008		51.471416	179.172861
	ROCK-CN-DUP	FAUNA	7/6/2011	4.53 ± 0.04	0.002	18.194 ± 0.161	0.008		51.471416	179.172861
Reindeer Lichen	STRL-AI-CT1-1	VEG	6/23/2011	9.8 ± 0.2	0.003	15.536 ± 0.317	0.005		51.480583	179.109472
Sea Urchin - whole	URCH-CN-CT1-1	FAUNA	7/8/2011	16.3 ± 0.2	0.002	65.4 ± 0.802	0.008		51.482972	179.123833
	URCH-CN-CT2-1	FAUNA	7/7/2011	13.9 ± 0.2	0.002	47.63 ± 0.685	0.007		51.472611	179.151111
	URCH-CN-CT3-1	FAUNA	7/5/2011	13.5 ± 0.2	0.002	51.711 ± 0.766	0.008		51.471416	179.172861
Amchitka Site (Adak Island) (AMC13)										
Dolly Varden - whole	DOLL-AD-XXX-1	FAUNA	6/28/2011	0.363 ± 0.002	0.001	1.481 ± 0.008	0.004		51.8375	-176.672555
Reindeer Lichen	STRL-AD-XXX-1	VEG	6/28/2011	3.59 ± 0.1	0.002	7.027 ± 0.196	0.004		51.837527	-176.670694
	STRL-AD-XXX-2	VEG	6/29/2011	3.33 ± 0.1	0.002	8.228 ± 0.247	0.005		51.872833	-176.707444
	STRL-AD-XXX-3	VEG	6/29/2011	5.5 ± 0.2	0.002	8.738 ± 0.318	0.003		51.900805	-176.688527
Amchitka Site (Adak Island North) (AMC14)										
Chiton	CHIT-AN-ANT1-1	FAUNA	7/20/2011	11 ± 0.2	0.002	53.573 ± 0.974	0.01		51.838722	-176.582805
	CHIT-AN-ANT2-1	FAUNA	7/18/2011	7.5 ± 0.2	0.002	37.592 ± 1.002	0.01		51.848361	-176.506277
	CHIT-AN-ANT3-1	FAUNA	7/17/2011	6.6 ± 0.2	0.001	33.562 ± 1.017	0.005		51.853722	-176.470694
Dragon Kelp	EUAL-AN-ANT1-1	VEG	7/19/2011	13.1 ± 0.2	0.002	109.845 ± 1.677	0.017		51.835694	-176.542138
	EUAL-AN-ANT1-2	VEG	7/19/2011	14 ± 0.2	0.002	95.434 ± 1.363	0.014		51.835694	-176.542138
	EUAL-AN-ANT1-3	VEG	7/19/2011	12.1 ± 0.4	0.002	93.523 ± 3.092	0.015		51.835694	-176.542138
	EUAL-AN-ANT2-1	VEG	7/18/2011	21.9 ± 0.4	0.002	159.643 ± 2.916	0.015		51.848361	-176.506277
	EUAL-AN-ANT2-2	VEG	7/18/2011	27.7 ± 0.6	0.002	176.517 ± 3.823	0.013		51.848361	-176.506277
	EUAL-AN-ANT2-3	VEG	7/18/2011	16.7 ± 0.2	0.002	115.996 ± 1.389	0.014		51.848361	-176.506277
	EUAL-AN-ANT3-1	VEG	7/17/2011	6.3 ± 0.2	0.001	47.087 ± 1.495	0.007		51.853722	-176.470694
	EUAL-AN-ANT3-2	VEG	7/17/2011	23.7 ± 0.2	0.001	161.615 ± 1.364	0.007		51.853722	-176.470694
	EUAL-AN-ANT3-3	VEG	7/17/2011	14.2 ± 0.2	0.002	95.29 ± 1.342	0.013		51.853722	-176.470694
	EUAL-AN-DUP	VEG	7/17/2011	38.2 ± 0.8	0.002	240.195 ± 5.03	0.013		51.853722	-176.470694

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Rockweed	FUCU-AN-ANT1-1	VEG	7/19/2011	68.8 ± 0.6	0.002	350.53 ± 3.057	0.01		51.841444	-176.546083
	FUCU-AN-ANT1-2	VEG	7/20/2011	39.8 ± 0.6	0.002	256.757 ± 3.871	0.013		51.8395	-176.591305
	FUCU-AN-ANT1-3	VEG	7/20/2011	64 ± 1	0.002	349.272 ± 5.457	0.011		51.8395	-176.591305
	FUCU-AN-ANT2-1	VEG	7/18/2011	65 ± 2	0.002	410.488 ± 12.63	0.013		51.837666	-176.517527
	FUCU-AN-ANT2-2	VEG	7/18/2011	37 ± 2	0.002	196.682 ± 10.631	0.011		51.841444	-176.546083
	FUCU-AN-ANT2-3	VEG	7/18/2011	95 ± 2	0.002	400.75 ± 8.437	0.008		51.8395	-176.591305
	FUCU-AN-ANT3-1	VEG	7/18/2011	50.9 ± 0.8	0.002	291.22 ± 4.577	0.011		51.839944	-176.515916
	FUCU-AN-ANT3-2	VEG	7/18/2011	74 ± 2	0.002	361.738 ± 9.777	0.01		51.828972	-176.448305
	FUCU-AN-ANT3-3	VEG	7/18/2011	70.3 ± 0.6	0.001	349.514 ± 2.983	0.005		51.830833	-176.456361
	FUCU-AN-DUP	VEG	7/18/2011	120 ± 4	0.002	558.399 ± 18.613	0.009		51.828972	-176.448305
Greenling - whole	GREN-AN-ANT1-1	FAUNA	7/19/2011	3.16 ± 0.04	0.002	14.027 ± 0.178	0.009		51.835694	-176.542138
	GREN-AN-ANT1-2	FAUNA	7/19/2011	1.59 ± 0.04	0.002	6.641 ± 0.167	0.008		51.835694	-176.542138
	GREN-AN-ANT1-3	FAUNA	7/19/2011	6.4 ± 0.2	0.002	23.31 ± 0.728	0.007		51.835694	-176.542138
	GREN-AN-ANT2-1	FAUNA	7/18/2011	7.3 ± 0.2	0.002	33.773 ± 0.925	0.009		51.848361	-176.506277
	GREN-AN-ANT2-2	FAUNA	7/18/2011	4.02 ± 0.1	0.001	18.632 ± 0.463	0.005		51.848361	-176.506277
	GREN-AN-ANT2-3	FAUNA	7/18/2011	3.52 ± 0.04	0.002	16.691 ± 0.19	0.009		51.848361	-176.506277
	GREN-AN-ANT3-1	FAUNA	7/17/2011	3.54 ± 0.06	0.002	16.157 ± 0.274	0.009		51.853722	-176.470694
	GREN-AN-ANT3-2	FAUNA	7/17/2011	1.47 ± 0.02	0.002	6.826 ± 0.093	0.009		51.853722	-176.470694
	GREN-AN-ANT3-3	FAUNA	7/17/2011	3.28 ± 0.06	0.002	15.263 ± 0.279	0.009		51.853722	-176.470694
	GREN-AN-DUP	FAUNA	7/17/2011	2.85 ± 0.04	0.002	13.575 ± 0.191	0.01		51.853722	-176.470694
Halibut - whole	HALI-AN-AN2M-1	FAUNA	7/17/2011	0.86 ± 0.02	0.002	2.871 ± 0.067	0.007		51.853722	-176.470694
	HALI-AN-DUP	FAUNA	7/17/2011	0.82 ± 0.02	0.002	2.718 ± 0.066	0.007		51.853722	-176.470694
Horse Mussel - soft tissue only	HMUS-AN-ANT1-1	FAUNA	7/20/2011	19 ± 0.2	0.001	103.881 ± 1.093	0.005		51.838722	-176.582805
	HMUS-AN-ANT2-1	FAUNA	7/18/2011	41.1 ± 0.6	0.002	188.741 ± 2.755	0.009		51.848361	-176.506277
	HMUS-AN-ANT3-1	FAUNA	7/18/2011	6.8 ± 0.2	0.001	30.306 ± 0.891	0.004		51.853722	-176.470694
Irish Lord - whole	IRLO-AN-ANT1-1	FAUNA	7/19/2011	3.8 ± 0.02	0.002	17.835 ± 0.094	0.009		51.835694	-176.542138
	IRLO-AN-ANT1-2	FAUNA	7/19/2011	2.27 ± 0.02	0.002	10.077 ± 0.089	0.009		51.835694	-176.542138
	IRLO-AN-ANT1-3	FAUNA	7/19/2011	3.18 ± 0.06	0.002	13.974 ± 0.264	0.009		51.835694	-176.542138
	IRLO-AN-ANT2-1	FAUNA	7/19/2011	2.92 ± 0.04	0.002	13.845 ± 0.19	0.009		51.848361	-176.506277
	IRLO-AN-ANT2-2	FAUNA	7/19/2011	3.39 ± 0.04	0.002	15.704 ± 0.185	0.009		51.848361	-176.506277
	IRLO-AN-ANT2-3	FAUNA	7/19/2011	10.31 ± 0.08	0.002	49.149 ± 0.381	0.01		51.848361	-176.506277
	IRLO-AN-ANT3-1	FAUNA	7/17/2011	6.08 ± 0.08	0.002	29.163 ± 0.384	0.01		51.853722	-176.470694
	IRLO-AN-ANT3-2	FAUNA	7/17/2011	1.5 ± 0.02	0.002	6.767 ± 0.09	0.009		51.853722	-176.470694
	IRLO-AN-ANT3-3	FAUNA	7/17/2011	2.65 ± 0.02	0.002	11.907 ± 0.09	0.009		51.853722	-176.470694
Octopus	OCTP-AN-AN2M-1	FAUNA	7/18/2011	10.7 ± 0.2	0.002	54.153 ± 1.012	0.01		51.848361	-176.506277

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Pacific Cod - whole	PCOD-AN-AN2M-1	FAUNA	7/17/2011	1.18 ± 0.02	0.001	5.74 ± 0.097	0.005		51.853722	-176.470694
Rockfish - whole	ROCK-AN-ANT1-1	FAUNA	7/19/2011	11.4 ± 0.2	0.002	42.175 ± 0.74	0.007		51.835694	-176.542138
	ROCK-AN-ANT2-1	FAUNA	7/18/2011	1.16 ± 0.02	0.001	4.238 ± 0.073	0.004		51.848361	-176.506277
	ROCK-AN-ANT2-2	FAUNA	7/18/2011	1.4 ± 0.2	0.002	5.721 ± 0.817	0.008		51.848361	-176.506277
	ROCK-AN-ANT3-1	FAUNA	7/17/2011	2.49 ± 0.04	0.001	8.872 ± 0.143	0.004		51.853722	-176.470694
	ROCK-AN-ANT3-2	FAUNA	7/17/2011	0.96 ± 0.02	0.002	3.703 ± 0.077	0.008		51.853722	-176.470694
	ROCK-AN-ANT3-3	FAUNA	7/17/2011	1.98 ± 0.04	0.002	7.772 ± 0.157	0.008		51.853722	-176.470694
Sea Urchin - whole	URCH-AN-ANT1-1	FAUNA	7/19/2011	4.71 ± 0.06	0.002	16.05 ± 0.204	0.007		51.835694	-176.542138
	URCH-AN-ANT2-1	FAUNA	7/18/2011	13.3 ± 0.2	0.002	48.45 ± 0.729	0.007		51.848361	-176.506277
	URCH-AN-ANT3-1	FAUNA	7/17/2011	14.2 ± 0.2	0.002	53.98 ± 0.76	0.008		51.853722	-176.470694
Amchitka Site (Adak Island South) (AMC15)										
Chiton	CHIT-AS-AST1-1	FAUNA	7/15/2011	22 ± 0.4	0.002	90.399 ± 1.644	0.008		51.737472	-176.48025
	CHIT-AS-AST2-1	FAUNA	7/16/2011	3.6 ± 0.04	0.002	18.428 ± 0.205	0.01		51.745666	-176.507055
	CHIT-AS-AST3-1	FAUNA	7/14/2011	23.2 ± 0.2	0.002	109.287 ± 0.942	0.009		51.688333	-176.63375
Dragon Kelp	EUAL-AS-AST1-1	VEG	7/15/2011	21.1 ± 0.6	0.001	139.043 ± 3.954	0.007		51.737472	-176.48025
	EUAL-AS-AST1-2	VEG	7/15/2011	15.1 ± 0.2	0.002	120.265 ± 1.593	0.016		51.737472	-176.48025
	EUAL-AS-AST1-3	VEG	7/15/2011	7.5 ± 0.2	0.002	71.973 ± 1.919	0.019		51.737472	-176.48025
	EUAL-AS-AST2-1	VEG	7/16/2011	13.1 ± 0.4	0.002	93.138 ± 2.844	0.014		51.745666	-176.507055
	EUAL-AS-AST2-2	VEG	7/16/2011	17.1 ± 0.2	0.001	120.996 ± 1.415	0.007		51.745666	-176.507055
	EUAL-AS-AST2-3	VEG	7/16/2011	25.4 ± 0.6	0.002	184.524 ± 4.359	0.015		51.745666	-176.507055
	EUAL-AS-AST3-1	VEG	7/14/2011	20.89 ± 0.06	0.002	152.584 ± 0.438	0.015		51.688333	-176.63375
	EUAL-AS-AST3-2	VEG	7/14/2011	7.6 ± 0.2	0.002	72.036 ± 1.896	0.019		51.688333	-176.63375
	EUAL-AS-AST3-3	VEG	7/14/2011	10.8 ± 0.4	0.001	95.227 ± 3.527	0.009		51.688333	-176.63375
	EUAL-AS-DUP	VEG	7/14/2011	1.18 ± 0.02	0.0002	8.683 ± 0.147	0.001		51.688333	-176.63375
Rockweed	FUCU-AS-AST1-1	VEG	7/16/2011	53 ± 2	0.002	326.938 ± 12.337	0.012		51.733666	-176.470805
Rockweed	FUCU-AS-AST1-2	VEG	7/16/2011	48 ± 2	0.002	266.256 ± 11.094	0.011		51.733666	-176.470805
	FUCU-AS-AST1-3	VEG	7/16/2011	71 ± 2	0.002	385.364 ± 10.855	0.011		51.733666	-176.470805
	FUCU-AS-AST2-1	VEG	7/16/2011	60.5 ± 0.8	0.002	292.435 ± 3.867	0.01		51.745666	-176.507055
	FUCU-AS-AST2-2	VEG	7/16/2011	77 ± 2	0.002	389.766 ± 10.124	0.01		51.745666	-176.507055
	FUCU-AS-AST2-3	VEG	7/16/2011	71 ± 2	0.002	348.791 ± 9.825	0.01		51.745666	-176.507055
	FUCU-AS-AST3-1	VEG	7/14/2011	60 ± 2	0.002	316.302 ± 10.543	0.011		51.688333	-176.63375
	FUCU-AS-AST3-2	VEG	7/14/2011	46 ± 2	0.002	226.529 ± 9.849	0.01		51.688333	-176.63375
	FUCU-AS-AST3-3	VEG	7/14/2011	38.8 ± 0.8	0.001	203.752 ± 4.201	0.005		51.688333	-176.63375
	FUCU-AS-DUP	VEG	7/16/2011	95.2 ± 0.6	0.001	492.037 ± 3.101	0.005		51.733666	-176.470805

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Greenling - whole	GREN-AS-AST1-1	FAUNA	7/15/2011	6.83 ± 0.08	0.002	32.538 ± 0.381	0.01		51.737472	-176.48025
	GREN-AS-AST1-2	FAUNA	7/15/2011	2.91 ± 0.04	0.001	13.729 ± 0.189	0.005		51.737472	-176.48025
	GREN-AS-AST1-3	FAUNA	7/15/2011	3.51 ± 0.04	0.001	16.859 ± 0.192	0.005		51.737472	-176.48025
	GREN-AS-AST2-1	FAUNA	7/16/2011	1.13 ± 0.02	0.001	4.539 ± 0.08	0.004		51.745666	-176.507055
	GREN-AS-AST2-2	FAUNA	7/16/2011	4.71 ± 0.08	0.002	21.543 ± 0.366	0.009		51.745666	-176.507055
	GREN-AS-AST2-3	FAUNA	7/16/2011	2.95 ± 0.04	0.002	13.739 ± 0.186	0.009		51.745666	-176.507055
	GREN-AS-AST3-1	FAUNA	7/14/2011	2.15 ± 0.08	0.001	10.24 ± 0.381	0.005		51.688333	-176.63375
	GREN-AS-AST3-2	FAUNA	7/14/2011	4.7 ± 0.2	0.001	22.123 ± 0.941	0.005		51.688333	-176.63375
	GREN-AS-AST3-3	FAUNA	7/14/2011	4.65 ± 0.08	0.002	22.207 ± 0.382	0.01		51.688333	-176.63375
	GREN-AS-DUP	FAUNA	7/14/2011	6.06 ± 0.08	0.002	30.388 ± 0.401	0.01		51.688333	-176.63375
Horse Mussel - soft tissue only	HMUS-AS-AST1-1	FAUNA	7/15/2011	27.3 ± 0.2	0.001	136.772 ± 1.002	0.005		51.737472	-176.48025
	HMUS-AS-AST2-1	FAUNA	7/16/2011	13 ± 0.2	0.001	82.469 ± 1.269	0.006		51.745666	-176.507055
	HMUS-AS-AST3-1	FAUNA	7/14/2011	37.3 ± 0.4	0.001	190.169 ± 2.039	0.005		51.688333	-176.63375
Irish Lord - whole	IRLO-AS-AST1-1	FAUNA	7/15/2011	5.4 ± 0.2	0.002	23.774 ± 0.881	0.009		51.737472	-176.48025
	IRLO-AS-AST1-2	FAUNA	7/15/2011	3.85 ± 0.04	0.002	17.951 ± 0.187	0.009		51.737472	-176.48025
	IRLO-AS-AST1-3	FAUNA	7/15/2011	9.61 ± 0.12	0.002	43.803 ± 0.547	0.009		51.737472	-176.48025
	IRLO-AS-AST2-1	FAUNA	7/16/2011	13 ± 0.2	0.002	60.838 ± 0.936	0.009		51.745666	-176.507055
	IRLO-AS-AST2-2	FAUNA	7/16/2011	3.99 ± 0.04	0.002	16.987 ± 0.17	0.009		51.745666	-176.507055
	IRLO-AS-AST2-3	FAUNA	7/16/2011	11 ± 0.2	0.002	55.649 ± 1.012	0.01		51.745666	-176.507055
	IRLO-AS-AST3-1	FAUNA	7/14/2011	4.71 ± 0.02	0.002	21.146 ± 0.09	0.009		51.688333	-176.63375
	IRLO-AS-AST3-2	FAUNA	7/14/2011	1.78 ± 0.02	0.002	7.521 ± 0.085	0.008		51.688333	-176.63375
	IRLO-AS-AST3-3	FAUNA	7/14/2011	3.36 ± 0.02	0.002	15.331 ± 0.091	0.009		51.688333	-176.63375
Pacific Cod - whole	PCOD-AS-AS2M-1	FAUNA	7/15/2011	1.38 ± 0.02	0.001	6.904 ± 0.1	0.005		51.737472	-176.48025
Rockfish - whole	ROCK-AS-AST1-1	FAUNA	7/15/2011	3.55 ± 0.08	0.002	12.763 ± 0.288	0.007		51.737472	-176.48025
	ROCK-AS-AST1-2	FAUNA	7/15/2011	2.25 ± 0.04	0.002	8.43 ± 0.15	0.007		51.737472	-176.48025
	ROCK-AS-AST1-3	FAUNA	7/15/2011	3.92 ± 0.06	0.002	16.878 ± 0.258	0.009		51.737472	-176.48025
	ROCK-AS-AST2-1	FAUNA	7/16/2011	5.36 ± 0.06	0.002	20.556 ± 0.23	0.008		51.745666	-176.507055
	ROCK-AS-AST2-2	FAUNA	7/16/2011	1.1 ± 0.02	0.002	4.086 ± 0.074	0.007		51.745666	-176.507055
	ROCK-AS-AST2-3	FAUNA	7/16/2011	3.71 ± 0.08	0.002	14.317 ± 0.309	0.008		51.745666	-176.507055
	ROCK-AS-AST3-1	FAUNA	7/14/2011	9.01 ± 0.1	0.003	36.942 ± 0.41	0.012		51.688333	-176.63375
	ROCK-AS-AST3-2	FAUNA	7/14/2011	9 ± 0.2	0.002	38.16 ± 0.848	0.008		51.688333	-176.63375
	ROCK-AS-AST3-3	FAUNA	7/14/2011	2.67 ± 0.06	0.001	11.587 ± 0.26	0.004		51.688333	-176.63375
	ROCK-AS-DUP	FAUNA	7/14/2011	1.61 ± 0.02	0.002	6.303 ± 0.078	0.008		51.688333	-176.63375

Matrix Subtype	Location Code	Matrix	Date Sampled	Wet Result ± Uncertainty	Wet Detection Limit	Dry Result ± Uncertainty	Dry Detection Limit	Qualifiers	Latitude	Longitude
Sea Urchin - whole	URCH-AS-AST1-1	FAUNA	7/15/2011	16.8 ± 0.2	0.002	63.812 ± 0.76	0.008		51.737472	-176.48025
	URCH-AS-AST2-1	FAUNA	7/16/2011	19.3 ± 0.4	0.002	77.915 ± 1.615	0.008		51.745666	-176.507055
	URCH-AS-AST3-1	FAUNA	7/14/2011	17.5 ± 0.2	0.002	65.347 ± 0.747	0.007		51.688333	-176.63375

Qualifier definitions:
U - Analytical result below detection limit
J - Estimated

Appendix K

Tritium Results

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Matrix Subtype	Location Code	Date Sampled	Result	Uncertainty	Detection Limit	Lab Qualifiers	Data Validation Qualifiers	Matrix	Latitude	Longitude	Salinity (‰)
Tritium (pCi/kg)											
Amchitka Site (Long Shot) (AMC02)											
	LAKE-AI-LT1-1	6/22/2011	8.8	0.3	0.3			WATER	51.432611	179.183444	
	LAKE-AI-LT1-1	6/22/2011	10	0.3	0.3			WATER	51.432611	179.183444	
Sea-Water	SEAW-LS-DUP	7/12/2011	1.7	0.3	0.3			WATER	51.442694	179.22925	35
	SEAW-LS-LT1-1	7/4/2011	2	0.3	0.3			WATER	51.457555	179.195138	36
	SEAW-LS-LT1-2	7/4/2011	1.6	0.3	0.3			WATER	51.457555	179.195138	36
	SEAW-LS-LT1-3	7/5/2011	1.7	0.3	0.3			WATER	51.457555	179.195138	36
	SEAW-LS-LT2-1	7/3/2011	1.8	0.3	0.3			WATER	51.44925	179.205583	33
	SEAW-LS-LT2-2	7/3/2011	1.7	0.3	0.3			WATER	51.44925	179.205583	34
	SEAW-LS-LT2-3	7/3/2011	1.5	0.3	0.3			WATER	51.44925	179.205583	35
	SEAW-LS-LT3-1	7/3/2011	1.9	0.3	0.3			WATER	51.43	179.22667	35
	SEAW-LS-LT3-2	7/3/2011	1.9	0.3	0.3			WATER	51.43	179.22667	35
	SEAW-LS-LT3-3	7/3/2011	1.5	0.3	0.3			WATER	51.43	179.22667	35
Amchitka Site (Milrow) (AMC03)											
Sea-Water	SEAW-ML-MT1-1	7/9/2011	2.2	0.3	0.3			WATER	51.408472	179.139166	36
	SEAW-ML-MT1-2	7/9/2011	1.8	0.3	0.3			WATER	51.408472	179.139166	34
	SEAW-ML-MT1-3	7/9/2011	1.6	0.3	0.3			WATER	51.408472	179.139166	36
	SEAW-ML-MT1-3	7/9/2011	1.9	0.3	0.3			WATER	51.408472	179.139166	36
	SEAW-ML-MT2-1	7/10/2011	2	0.3	0.3			WATER	51.389416	179.173138	34
	SEAW-ML-MT2-2	7/10/2011	1.8	0.3	0.3			WATER	51.389416	179.173138	34
	SEAW-ML-MT2-3	7/10/2011	1.9	0.3	0.3			WATER	51.389416	179.173138	34
	SEAW-ML-MT3-1	7/10/2011	1.8	0.3	0.3			WATER	51.387805	179.184	35
	SEAW-ML-MT3-2	7/10/2011	2	0.3	0.3			WATER	51.387805	179.184	35
	SEAW-ML-MT3-3	7/10/2011	1.6	0.3	0.3			WATER	51.387805	179.184	34
Amchitka Site (Cannikin) (AMC05)											
	LAKE-AI-CN-1	6/24/2011	7.9	0.3	0.3			WATER	51.468277	179.108055	
	LAKE-AI-CN-1	6/24/2011	7.6	0.3	0.3			WATER	51.468277	179.108055	
Sea-Water	SEAW-CN-C2M-1A-D	7/8/2011	1.8	0.3	0.3			WATER	51.485027	179.12075	35
	SEAW-CN-C2M-1A-S	7/8/2011	1.5	0.3	0.3			WATER	51.485027	179.12075	35
	SEAW-CN-C2M-1B-D	7/8/2011	1.8	0.3	0.3			WATER	51.482555	179.132861	35
	SEAW-CN-C2M-1B-S	7/8/2011	1.6	0.3	0.3			WATER	51.482555	179.132861	35
	SEAW-CN-C2M-1CAN-D	6/24/2011	1.6	0.3	0.3			WATER	51.48715	179.19055	34
	SEAW-CN-C2M-1CAN-D	6/24/2011	1.7	0.3	0.3			WATER	51.48715	179.19055	34

Matrix Subtype	Location Code	Date Sampled	Result	Uncertainty	Detection Limit	Lab Qualifiers	Data Validation Qualifiers	Matrix	Latitude	Longitude	Salinity (‰)
Sea-Water	SEAW-CN-C2M-1CAN-S	6/24/2011	1.7	0.3	0.3			WATER	51.48715	179.19055	33
	SEAW-CN-C2M-1CAN-S	6/24/2011	1.3	0.3	0.3			WATER	51.48715	179.19055	34
	SEAW-CN-C2M-1C-D	7/6/2011	2.1	0.3	0.3			WATER	51.478366	179.153183	35
	SEAW-CN-C2M-1C-S	7/6/2011	1.6	0.3	0.3			WATER	51.478366	179.153183	35
	SEAW-CN-C2M-1D-D	7/3/2011	1.4	0.3	0.3			WATER	51.455333	179.197483	35
	SEAW-CN-C2M-1D-S	7/3/2011	1.7	0.3	0.3			WATER	51.455333	179.197483	35
	SEAW-CN-C2M-1E-D	6/24/2011	1.6	0.3	0.3			WATER	51.465983	179.223666	35
	SEAW-CN-C2M-1E-S	6/24/2011	1.6	0.3	0.3			WATER	51.465983	179.223666	35
	SEAW-CN-C2M-1F-D	7/3/2011	1.5	0.3	0.3			WATER	51.450716	179.20635	35
	SEAW-CN-C2M-1F-S	7/3/2011	1.8	0.3	0.3			WATER	51.450716	179.20635	35
	SEAW-CN-C2M-1SB-D	7/3/2011	1.6	0.3	0.3			WATER	51.450916	179.195316	35
	SEAW-CN-C2M-1SB-D	7/3/2011	1.8	0.3	0.3			WATER	51.450916	179.195316	35
	SEAW-CN-C2M-1SB-S	7/3/2011	1.7	0.3	0.3			WATER	51.450916	179.195316	35
	SEAW-CN-C2M-1SB-S	7/3/2011	1.7	0.3	0.3			WATER	51.450916	179.195316	35
	SEAW-CN-C2M-2A-D	7/6/2011	1.6	0.3	0.3			WATER	51.489316	179.1338	35
	SEAW-CN-C2M-2A-S	7/6/2011	1.6	0.3	0.3			WATER	51.489316	179.1338	35
	SEAW-CN-C2M-2B-D	7/6/2011	1.5	0.3	0.3			WATER	51.486233	179.139033	34
	SEAW-CN-C2M-2B-D	7/6/2011	1.7	0.3	0.3			WATER	51.486233	179.139033	34
	SEAW-CN-C2M-2B-S	7/6/2011	1.5	0.3	0.3			WATER	51.486233	179.139033	35
	SEAW-CN-C2M-2B-S	7/6/2011	1.5	0.3	0.3			WATER	51.486233	179.139033	35
	SEAW-CN-C2M-2CAN-D	7/6/2011	1.8	0.3	0.3			WATER	51.474533	179.169866	35
	SEAW-CN-C2M-2CAN-S	7/6/2011	1.9	0.3	0.3			WATER	51.474533	179.169866	35
	SEAW-CN-C2M-2C-D	7/6/2011	1.3	0.3	0.3			WATER	51.489316	179.168783	35
	SEAW-CN-C2M-2C-S	7/6/2011	1.7	0.3	0.3			WATER	51.489316	179.168783	35
	SEAW-CN-C2M-2D-D	6/24/2011	1.6	0.3	0.3			WATER	51.463616	179.23645	35
	SEAW-CN-C2M-2D-S	6/24/2011	1.3	0.3	0.3			WATER	51.463616	179.23645	35
	SEAW-CN-C2M-2E-D	6/24/2011	1.6	0.3	0.3			WATER	51.48365	179.268433	35
	SEAW-CN-C2M-2E-S	6/24/2011	1.9	0.3	0.3			WATER	51.48365	179.268433	35
	SEAW-CN-C2M-2F-D	6/24/2011	1.5	0.3	0.3			WATER	51.479066	179.272866	34

Matrix Subtype	Location Code	Date Sampled	Result	Uncertainty	Detection Limit	Lab Qualifiers	Data Validation Qualifiers	Matrix	Latitude	Longitude	Salinity (‰)
Sea-Water	SEAW-CN-C2M-2F-S	6/24/2011	1.2	0.3	0.3			WATER	51.479066	179.272866	35
	SEAW-CN-C2M-2SB-D	7/3/2011	1.7	0.3	0.3			WATER	51.448283	179.217383	35
	SEAW-CN-C2M-2SB-S	7/3/2011	1.4	0.3	0.3			WATER	51.448283	179.217383	35
	SEAW-CN-C2M-3A-D	7/6/2011	1.5	0.3	0.3			WATER	51.4936	179.149683	35
	SEAW-CN-C2M-3A-S	7/6/2011	1.7	0.3	0.3			WATER	51.4936	179.149683	35
	SEAW-CN-C2M-3B-D	6/24/2011	1.3	0.3	0.3			WATER	51.511816	179.18085	33
	SEAW-CN-C2M-3B-S	6/24/2011	1.8	0.3	0.3			WATER	51.511816	179.18085	33
	SEAW-CN-C2M-3CAN-D	6/24/2011	1.8	0.3	0.3			WATER	51.511416	179.240416	34
	SEAW-CN-C2M-3CAN-S	6/24/2011	1.6	0.3	0.3			WATER	51.511416	179.240416	34
	SEAW-CN-C2M-3C-D	6/24/2011	1.6	0.3	0.3			WATER	51.523666	179.218083	34
	SEAW-CN-C2M-3C-S	6/24/2011	1.6	0.3	0.3			WATER	51.523666	179.218083	34
	SEAW-CN-C2M-3D-D	6/24/2011	1.3	0.3	0.3			WATER	51.4735	179.282333	35
	SEAW-CN-C2M-3D-S	6/24/2011	2	0.3	0.3			WATER	51.4735	179.282333	35
	SEAW-CN-C2M-4A-D	6/24/2011	1.5	0.3	0.3			WATER	51.504033	179.18895	34
	SEAW-CN-C2M-4A-S	6/24/2011	1.7	0.3	0.3			WATER	51.504033	179.18895	34
	SEAW-CN-C2M-4B-D	6/24/2011	1.4	0.3	0.3			WATER	51.529133	179.209066	35
	SEAW-CN-C2M-4B-S	6/24/2011	1.7	0.3	0.3			WATER	51.529133	179.209066	34
	SEAW-CN-C2M-5A-D	6/24/2011	1.3	0.3	0.3			WATER	51.5156	179.232333	34
	SEAW-CN-C2M-5A-S	6/24/2011	1.7	0.3	0.3			WATER	51.5156	179.232333	34
	SEAW-CN-C2M-C1-2-D	6/24/2011	1.6	0.3	0.3			WATER	51.47845	179.219516	35
	SEAW-CN-C2M-C1-2-S	6/24/2011	1.8	0.3	0.3			WATER	51.47845	179.219516	35
	SEAW-CN-C2M-C3-4-D	6/24/2011	1.4	0.3	0.3			WATER	51.497233	179.2102	34
	SEAW-CN-C2M-C3-4-S	6/24/2011	1.4	0.3	0.3			WATER	51.497233	179.2102	34
	SEAW-CN-C2M-C4-1-D	7/6/2011	1.6	0.3	0.3			WATER	51.482933	179.1861	35
	SEAW-CN-C2M-C4-1-S	7/6/2011	1.7	0.3	0.3			WATER	51.482933	179.1861	35
	SEAW-CN-C2M-C4-4-D	6/24/2011	1.6	0.3	0.3			WATER	51.496283	179.18915	34

Matrix Subtype	Location Code	Date Sampled	Result	Uncertainty	Detection Limit	Lab Qualifiers	Data Validation Qualifiers	Matrix	Latitude	Longitude	Salinity (‰)
Sea-Water	SEAW-CN-C2M-C4-4-S	6/24/2011	1.5	0.3	0.3			WATER	51.496283	179.18915	33
	SEAW-CN-C2M-C5-1-D	7/6/2011	1.9	0.3	0.3			WATER	51.4836	179.15425	34
	SEAW-CN-C2M-C5-1-S	7/6/2011	2.2	0.3	0.3			WATER	51.4836	179.15425	35
	SEAW-CN-C2M-LS2-2-D	6/24/2011	1.4	0.3	0.3			WATER	51.4404	179.244366	35
	SEAW-CN-C2M-LS2-2-S	6/24/2011	1.7	0.3	0.3			WATER	51.4404	179.244366	35
	SEAW-CN-CT1-1	7/8/2011	1.5	0.3	0.3			WATER	51.482972	179.123833	35
	SEAW-CN-CT1-2	7/8/2011	1.4	0.3	0.3			WATER	51.482972	179.123833	35
	SEAW-CN-CT1-3	7/8/2011	1.8	0.3	0.3			WATER	51.482972	179.123833	35
	SEAW-CN-CT2-1	7/6/2011	2.2	0.3	0.3			WATER	51.472611	179.151111	35
	SEAW-CN-CT2-2	7/7/2011	1.7	0.3	0.3			WATER	51.472611	179.151111	35
	SEAW-CN-CT2-3	7/7/2011	2.1	0.3	0.3			WATER	51.472611	179.151111	32
	SEAW-CN-CT3-1	7/5/2011	1.7	0.3	0.3			WATER	51.471416	179.172861	35
	SEAW-CN-CT3-2	7/5/2011	1.7	0.3	0.3			WATER	51.471416	179.172861	35
	SEAW-CN-CT3-3	7/6/2011	1.7	0.3	0.3			WATER	51.471416	179.172861	35
	SEAW-CN-CT3-3	7/6/2011	1.4	0.3	0.3			WATER	51.471416	179.172861	35
Amchitka Site (Adak Island North) (AMC14)											
Sea-Water	SEAW-AN-ANT1-1	7/19/2011	1.5	0.3	0.3			WATER	51.835694	-176.542138	35
	SEAW-AN-ANT1-2	7/19/2011	1.8	0.3	0.3			WATER	51.835694	-176.542138	35
	SEAW-AN-ANT1-3	7/19/2011	1.7	0.3	0.3			WATER	51.835694	-176.542138	35
	SEAW-AN-ANT2-1	7/18/2011	1.8	0.3	0.3			WATER	51.848361	-176.506277	35
	SEAW-AN-ANT2-2	7/18/2011	1.6	0.3	0.3			WATER	51.848361	-176.506277	35
	SEAW-AN-ANT2-3	7/18/2011	1.7	0.3	0.3			WATER	51.848361	-176.506277	35
	SEAW-AN-ANT3-1	7/17/2011	2.2	0.3	0.3			WATER	51.853722	-176.470694	35
	SEAW-AN-ANT3-2	7/17/2011	1.7	0.3	0.3			WATER	51.853722	-176.470694	35
	SEAW-AN-ANT3-2	7/17/2011	1.4	0.3	0.3			WATER	51.853722	-176.470694	35
	SEAW-AN-ANT3-3	7/17/2011	1.7	0.3	0.3			WATER	51.853722	-176.470694	35

Matrix Subtype	Location Code	Date Sampled	Result	Uncertainty	Detection Limit	Lab Qualifiers	Data Validation Qualifiers	Matrix	Latitude	Longitude	Salinity (‰)
Amchitka Site (Adak Island South) (AMC15)											
Sea-Water	SEAW-AS-AST1-1	7/15/2011	2	0.3	0.3			WATER	51.737472	-176.48025	34
	SEAW-AS-AST1-2	7/15/2011	2.5	0.3	0.3			WATER	51.737472	-176.48025	35
	SEAW-AS-AST1-3	7/15/2011	1.6	0.3	0.3			WATER	51.737472	-176.48025	35
	SEAW-AS-AST2-1	7/16/2011	1.8	0.3	0.3			WATER	51.745666	-176.507055	35
	SEAW-AS-AST2-2	7/16/2011	1.8	0.3	0.3			WATER	51.745666	-176.507055	35
	SEAW-AS-AST2-3	7/16/2011	2.1	0.3	0.3			WATER	51.745666	-176.507055	35
	SEAW-AS-AST3-1	7/14/2011	2.8	0.3	0.3			WATER	51.688333	-176.63375	36
	SEAW-AS-AST3-2	7/14/2011	1.4	0.3	0.3			WATER	51.688333	-176.63375	35
	SEAW-AS-AST3-3	7/14/2011	1.4	0.3	0.3			WATER	51.688333	-176.63375	37
	SEAW-AS-AST3-3	7/14/2011	1.9	0.3	0.3			WATER	51.688333	-176.63375	36

Qualifier definitions:
U - Analytical result below detection limit
J - Estimated

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Appendix L

2004 (CRESP) and 2011 Data Comparison Summary

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Table L-1. Summary of Marine Species Sampled in Both 2004 (CRESP) and 2011

Species	^{137}Cs	^{241}Am	$^{239,240}Pu$	^{234}U	^{235}U	^{238}U
Dragon kelp	X	X	X	X	X	X
Rockweed	X	X	X	X	X	X
Reindeer lichen	See Note					
Gumboot or Pacific chiton	X	X				
Horse mussel	See Note	X	X	X	X	X
Sea urchin	X	X				
Rockfish	X	X	X	X	X	X
Red or yellow Irish lord	X	X	X	X	X	X
Rock greenling	X	X				
Pacific halibut	X	X	X	X	X	X
Pacific cod	X	X	X	X	X	X
Octopus	X	X				
Dolly Varden	X	X				
Glaucous-winged gull eggs	X	X				

Notes:

Reindeer lichen samples were collected only in 2011 (for ^{137}Cs analysis only).
Because horse mussel samples were not analyzed for ^{137}Cs in 2004, 2011 results for ^{137}Cs in horse mussel were compared with 2004 blue mussel results given the same genus.
In 2004, samples of glaucous-winged gull soft tissue and bone were also collected.

Species sampled in 2004 but not in 2011 are listed below; most marine fauna samples were soft tissue samples unless otherwise noted.

Marine flora and fauna species sampled in 2004 (CRESP) but not in 2011

- *Alaria nana* (ribbon kelp)
- Atka mackerel (bone and soft tissue)
- Bald eagle
- Blue mussel
- Common eider (egg and soft tissue)
- Limpets
- Northern rock sole
- Pacific Ocean perch (bone and soft tissue)
- Pigeon guillemot (bone and soft tissue)
- Rock jingle
- Sea lion
- Tufted puffin (bone and soft tissue)
- Tufted puffin (soft tissue)
- *Ulva latuca* (see lettuce)
- Walleye pollock

Table L-2. Summary of ^{137}Cs Results for Marine Flora and Fauna: 2004 (CRESP) vs. 2011 Sampling

	2004 (CRESP)[a]				2011[a]			
Species **Area**[b]	***n***	% > MDC	**Range of Detects**[c]	**Range of MDCs**	***n***	% > MDC	**Range of Detects**[c]	**Range of MDCs**
Dragon Kelp								
Amchitka	5	0%		2.8 – 146	27	100%	0.24 – 3.2	0.1 – 0.7
Kiska/Adak*	3	0%		2.8 – 182	18	100%	0.2 – 2.0	0.2 – 0.5
*Kiska (2004 only)/Adak (2011 only); formatting applies to all subsequent entries.								
Sea Urchin								
Amchitka	5	0%		2.4 – 234	9	56%	1.8 – 9.9	1.1 – 4.3
Kiska/Adak	2	0%		8.5 – 206	6	33%	2.7 – 9.4	1.2 – 3.7
Horse Mussel (Blue Mussel used for 2004)								
Amchitka	1	0%		19.9	9	89%	1.4 – 14	2.6 – 60
Kiska/Adak	1	0%		11.7	6	100%	3.4 – 15	2.7 – 5.0
Chiton								
Amchitka	1	0%		9.4	9	33%	1.6 – 4.1	1.2 – 2.8
Kiska/Adak	0				6	67%	0.8 – 1.3	0.7 – 4.0
Rockfish								
Amchitka	14	14%	3.0 – 5.1	2.5 – 207	26	88%	1.1 – 6.4	0.7 – 2.2
Kiska/Adak	4	25%	3.5	2.6 – 106	15	93%	1.2 – 9.4	0.5 – 2.4
Greenling								
Amchitka	23	0%		4.6 – 119	27	96%	1.9 – 7.8	1.5 – 2.8
Kiska/Adak	7	0%		2.7 – 107	18	100%	0.9 – 7.4	1.3 – 3.6
Irish Lord								
Amchitka	19	11%	3.5 – 30.0	2.6 – 300	27	67%	1.2 – 9.5	0.8 – 3.9
Kiska/Adak	9	0%		2.8 – 620	18	56%	1.8 – 13	0.9 – 2.5
Octopus								
Amchitka	4	100%	6.40 – 8.2	2.4 – 2.6	3	100%	0.23 – 2.1	0.2 – 1.1
Kiska/Adak	0				1	100%	0.7	0.5
Pacific Cod								
Amchitka	24	21%	4.8 – 16.3	2.6 – 210	3	100%	2.1 – 3.8	0.2 – 0.5
Kiska/Adak	9	22%	5.1 – 8.5	2.8 – 250	2	100%	2.0 – 3.0	0.2 – 0.3
Halibut								
Amchitka	2	50%	12.0	2.5 – 8.8	3	100%	0.82 – 1.5	0.1 – 0.2
Kiska/Adak	2	100%	5.1 – 8.5[d]	2.7 2.8	1	100%	1.0	0.2
Rockweed								
Amchitka	4	0%		9.1 – 200	27	100%	1.3 – 5.8	0.2 – 0.5
Kiska/Adak	2	0%		8.6 – 160	18	100%	1.0 – 7.3	0.3 – 0.5
Star Reindeer Lichen								
Amchitka	0				3	100%	404 – 1523	8.0 – 15.0
Kiska/Adak	0				3	100%	2855 – 6236	16.0 – 33.0
Gull Eggs (Adak not sampled in 2011)								
Amchitka	1	0%		5.8 – 5.8	1	100%	4.2	1.5
Kiska/Adak	1	0%		7.2 – 7.2	0			
Dolly Varden								
Amchitka	10	20%	18.8 – 21.1	3.0 – 109	1	100%	98	1.0
Kiska/Adak	0				1	100%	447	1.0

n = number of samples; MDC = minimum detectable concentration

[a] A more detailed summary of ^{137}Cs data for the 2011 sampling effort is provided in Table 6 of the main report.

[b] Reference (background) area Kiska was sampled in 2004 only, whereas Adak Island was sampled in 2011 only.

[c] Duplicate samples were not easily identified in the 2004 database, which may be reflected in the sample numbers and ranges reported for the 2004 sampling period. Due to the large proportion of results <MDC in 2004, maximum detections for both years are highlighted (yellow) to facilitate comparison.

[d] Maximum detected ^{137}Cs concentration in halibut in 2004, 8.5 pCi/kg, was from Rat (now referred to as Hawadax) Island.

Table L-3. Summary of ^{241}Am Results for Marine Flora and Fauna: 2004 (CRESP) vs. 2011 Sampling

	2004 (CRESP)[a]				2011[a]			
Species Area[b]	***n***	% > MDC	**Range of Detects[c]**	**Range of MDCs**	***n***	% > MDC	**Range of Detects[c]**	**Range of MDCs**
Dragon Kelp								
Amchitka	17	0%		0.3 – 5.5	27	74%	0.003 – 0.03	0.0003 – 0.004
Kiska/Adak*	6	0%		0.6 – 15	18	83%	0.006 – 0.03	0.0002 – 0.002
*Kiska (2004 only)/Adak (2011 only); formatting applies to all subsequent entries.								
Sea Urchin								
Amchitka	2	0%		4.1 – 9.9	9	89%	0.08 – 0.20	0.002 – 0.01
Kiska/Adak	1	0%		9.7 – 9.7	6	83%	0.07 – 0.12	0.003 – 0.03
Horse Mussel								
Amchitka	6	0%		0.63 – 1.3	9	67%	0.11 – 0.21	0.005 – 0.80
Kiska/Adak	2	50%	0.57	0.33 – 0.69	6	33%	0.09 – 0.15	0.009 – 0.05
Chiton								
Amchitka	1	0%		9.4	9	89%	0.07 – 0.14	0.002 – 0.01
Kiska/Adak	0				6	67%	0.02 – 0.08	0.002 – 0.02
Rockfish								
Amchitka	14	0%		6.6 – 814	26	12%	0.01 – 0.07	0.003 – 0.03
Kiska/Adak	5	20%	0.78	0.8 – 473	15	0%		0.003 – 0.01
Greenling								
Amchitka	25	0%		10.9 – 678	27	11%	0.03 – 0.03	0.002 – 0.02
Kiska/Adak	7	0%		7.2 – 470	18	17%	0.01 – 0.03	0.002 – 0.03
Irish Lord								
Amchitka	21	0%		0.7 – 495	27	11%	0.01 0.03	0.002 – 0.02
Kiska/Adak	9	0%		0.3 – 590	18	6%	0.03	0.004 – 0.01
Octopus								
Amchitka	4	100%		7.2 – 7.3	3	67%	0.02 – 0.02	0.0004 – 0.01
Kiska/Adak	0				1	100%	0.02	0.002
Pacific Cod								
Amchitka	33	0%		0.30 – 473	3	0%		0.001 – 0.002
Kiska/Adak	15	7%	0.39	0.33 – 481	2	0%		0.001
Halibut								
Amchitka	6	0%		0.59 – 11.6	3	0%		0.001 – 0.002
Kiska/Adak	5[d]	0%		0.30 – 7.5	1	0%		0.001
Rockweed								
Amchitka	11	18%	0.75 – 0.94	0.3 – 14	27	22%	0.003 – 0.01	0.001 – 0.01
Kiska/Adak	5	0%		0.7 – 11	18	39%	0.01 – 0.02	0.001 – 0.01
Gull Eggs (Adak not sampled in 2011)								
Amchitka	1	0%		16.3	1	0%		0.01
Kiska/Adak	1	0%		20.1	0			
Dolly Varden								
Amchitka	10	0%		3.0 – 109	1	0%		0.002
Kiska/Adak	0				1	0%		0.002

n = number of samples; MDC = minimum detectable concentration

[a] A more detailed summary of ^{241}Am data for the 2011 sampling effort is provided in Table 7 of the main report.

[b] Reference (background) area Kiska was sampled in 2004 only, whereas Adak Island was sampled in 2011 only.

[c] Duplicate samples were not easily identified in the 2004 database, which may be reflected in the sample numbers and ranges reported for the 2004 sampling period. Due to the large proportion of results <MDC in 2004, maximum detections for both years are highlighted (yellow) to facilitate comparison.

[d] In 2004, 3 halibut samples were collected from Kiska island, and 2 from Rat Island.

Table L-4. Summary of $^{239, 240}$Pu Results for Marine Flora and Fauna: 2004 (CRESP) vs. 2011 Sampling

	2004 (CRESP)				2011 [a]			
Species Area[b]	***n***	% > MDC	**Range of Detects[c]**	**Range of MDCs**	***n***	% > MDC	**Range of Detects[c]**	**Range of MDCs**
Dragon Kelp								
Amchitka	15	33%	1.1 – 5.6	0.6 – 4.1	27	96%	0.003 – 0.29	0.003 – 0.01
Kiska/Adak*	4	25%	2.4	1.1 – 2.1	18	100%	0.020 – 0.20	0.003 – 0.01
*Kiska (2004 only)/Adak (2011 only); formatting applies to all subsequent entries.								
Horse Mussel								
Amchitka	6	17%	1.3	0.71 – 1.2	9	22%	0.11 – 0.25	0.08 – 2.0
Kiska/Adak	2	0%		0.98 – 1.06	6	17%	0.073	0.07 – 0.2
Rockfish								
Amchitka	0				26	0%		0.01 – 0.06
Kiska/Adak	1	0%		0.84	15	0%		0.01 – 0.06
Irish Lord								
Amchitka	2	0%		0.78 – 1.2	27	0%		0.01 – 0.08
Kiska/Adak	1	0%		0.76 – 0.76	18	0%		0.02 – 0.07
Pacific Cod								
Amchitka	14	0%		0.38 – 2.6	3	0%		0.003 – 0.01
Kiska/Adak	7	0%		0.81 – 3.8	2	0%		0.003 – 0.01
Halibut								
Amchitka	4	25%	0.47	0.38 – 2.5	3	0%		0.003 – 0.01
Kiska/Adak	3[d]	0%		0.92 – 2.1	1	0%		0.002 – 0.004
Rockweed								
Amchitka	10	50%	1.2 – 1.6	0.90 – 1.8	27	93%	0.002 – 0.03	0.002 – 0.01
Kiska/Adak	4	0%		0.78 – 1.0	18	83%	0.002 – 0.03	0.002 – 0.01

n = number of samples; MDC = minimum detectable concentration

[a] A more detailed summary of $^{239, 240}$Pu data for the 2011 sampling effort is provided in Table 10. Results for individual Pu isotopes are provided in Tables 8 and 9. In 2011, ^{240}Pu was detected in only 3 species: dragon kelp, rockweed, and sea urchin (latter not sampled in 2004).

[b] Reference (background) area Kiska was sampled in 2004 only, whereas Adak Island was sampled in 2011 only.

[c] Due to the large proportion of results <MDC in 2004, maximum detections for both years are highlighted (yellow) to facilitate comparison.

[d] In 2004, 2 halibut samples were collected from Kiska island, and 1 from Rat Island.

Table L-5. Summary of ^{234}U Results for Marine Flora and Fauna: 2004 (CRESP) vs. 2011 Sampling

	2004 (CRESP)				2011 [a]			
Species Area[b]	***n***	% > MDC	**Range of Detects[c]**	**Range of MDCs**	***n***	% > MDC	**Range of Detects[c]**	**Range of MDCs**
Dragon Kelp								
Amchitka	15	100%	5.9 – 55.7	0.5 – 2.7	27	100%	12.4 – 44.6	1.0 – 2.0
Kiska/Adak*	4	100%	7.9 – 31.6	1.2 – 1.5	18	100%	7.3 – 33.7	0.4 – 1.0
*Kiska (2004 only)/Adak (2011 only).								
Horse Mussel								
Amchitka	6	100%	12 – 75.1	0.8 – 1.4	9	89%	23.4 – 80.8	1.0 – 28
Kiska/Adak	2	100%	8.4 – 12.6	1.0 – 1.0	6	100%	9.7 – 49.8	0.5 – 1.0
Rockfish								
Amchitka	0				26	96%	2.3 – 17.2	1.0 – 2.0
Kiska/Adak	1	100%	58.9	1.1	15	80%	2.2 – 13.4	1.0 – 2.0
Irish Lord								
Amchitka	2	100%	9.9 – 13.1	0.73 – 1.0	27	93%	3.0 – 19.3	1.0 – 2.0
Kiska/Adak	1	100%	15.3	1.0	18	94%	2.9 – 16.0	1.0
Pacific Cod								
Amchitka	14	93%	1.1 – 6.6	0.8 – 1.4	3	67%	2.5 – 3.0	1.0
Kiska/Adak	7	57%	-0.5 – 7.8	0.8 – 1.3	2	100%	1.9 – 1.9	1.0
Halibut								
Amchitka	4	100%	1.9 – 32	0.8 – 1.9	3	33%	0.6	0.6 – 1.0
Kiska/Adak	3[d]	67%	0.7 – 4.3	1.1 – 1.3	1	0%		1.0
Rockweed								
Amchitka	10	100%	50 – 130	0.8 – 1.5	27	100%	35.0 – 144	1.0
Kiska/Adak	4	100%	74 – 140	0.4 – 1.3	18	100%	45.5 – 113	1.0

n = number of samples; MDC = minimum detectable concentration
[a] A more detailed summary of ^{234}U data for the 2011 sampling effort is provided in Table 11.
[b] Reference (background) area Kiska was sampled in 2004 only, whereas Adak Island was sampled in 2011 only.
[c] Maximum detections for both years are highlighted (yellow) to facilitate comparison.
[d] In 2004, 2 halibut samples were collected from Kiska island, and 1 from Rat Island.

Table L-6. Summary of ^{235}U Results for Marine Flora and Fauna: 2004 (CRESP) vs. 2011 Sampling

	2004 (CRESP)				2011 [a]			
Species Area[b]	***n***	% > MDC	**Range of Detects[c]**	**Range of MDCs**	***n***	% > MDC	**Range of Detects[c]**	**Range of MDCs**
Dragon Kelp								
Amchitka	15	47%	1.3 – 4.3	1.1 – 3.3	27	100%	0.4 – 1.5	0.0002 – 0.001
Kiska/Adak*	4	25%	1.6	1.0 – 1.6	18	100%	0.3 – 1.2	0.0002 – 0.001
*Kiska (2004 only)/Adak (2011 only).								
Horse Mussel								
Amchitka	6	33%	1.3 – 3.8	0.4 – 1.5	9	100%	0.5 – 2.9	0.0004 – 0.010
Kiska/Adak	2	0%		0.9 – 1.3	6	100%	0.3 – 1.8	0.0002 – 0.0004
Rockfish								
Amchitka	0				26	100%	0.1 – 0.59	0.0003 – 0.0007
Kiska/Adak	1	100%	3.1	1.6	15	100%	0.0 – 0.48	0.0002 – 0.0007
Irish Lord								
Amchitka	2	100%	9.9 – 13.1	1.20 – 1.5	27	100%	0.1 – 0.68	0.0003 – 0.0007
Kiska/Adak	1	100%	15.3	1.20 – 1.2	18	100%	0.1 – 0.55	0.0004 – 0.0005
Pacific Cod								
Amchitka	14	0%		0.9 – 2.0	3	100%	0.0 – 0.09	0.0003
Kiska/Adak	7	0%		0.9 – 1.4	2	100%	0.1 – 0.06	0.0002 – 0.0003
Halibut								
Amchitka	4	25%	1.3	0.9 – 2.1	3	100%	0.0 – 0.03	0.0002 – 0.0004
Kiska/Adak	3[d]	0%		1.1 – 1.7	1	100%	0.04	0.0004
Rockweed								
Amchitka	10	100%	2.5 – 5.4	0.6 – 1.7	27	100%	1.2 – 5.10	0.0002 – 0.0005
Kiska/Adak	4	75%	3.2 – 6.9	1.0 – 1.6	18	100%	1.6 – 4.01	0.0003 – 0.0005

n = number of samples; MDC = minimum detectable concentration
[a] A more detailed summary of ^{235}U data for the 2011 sampling effort is provided in Table 12.
[b] Reference (background) area Kiska was sampled in 2004 only, whereas Adak Island was sampled in 2011 only.
[c] Maximum detections for both years are highlighted (yellow) to facilitate comparison.
[d] In 2004, 2 halibut samples were collected from Kiska island, and 1 from Rat Island.

Table L-7. Summary of ^{238}U Results for Marine Flora and Fauna: 2004 (CRESP) vs. 2011 Sampling

	2004 (CRESP)				2011 [a]			
Species Area[b]	***n***	% > MDC	**Range of Detects[c]**	**Range of MDCs**	***n***	% > MDC	**Range of Detects[c]**	**Range of MDCs**
Dragon Kelp								
Amchitka	15	100%	5.2 – 57.0	0.9 – 2.0	27	100%	9.6 – 35.4	0.001 – 0.003
Kiska/Adak*	4	100%	10.7 – 33.8	0.9 – 1.3	18	100%	6.3 – 27.7	0.001 – 0.002
*Kiska (2004 only)/Adak (2011 only).								
Horse Mussel								
Amchitka	6	100%	11 – 61.6	0.7 – 1.4	9	100%	12.2 – 67.1	0.002 – 0.04
Kiska/Adak	2	100%	7.5 – 12.6	1.0	6	100%	6.8 – 41.1	0.001 – 0.002
Rockfish								
Amchitka	0				26	100%	1.9 – 13.9	0.001 – 0.003
Kiska/Adak	1	100%	49.5	1.0	15	100%	1.0 – 11.4	0.001 – 0.003
Irish Lord								
Amchitka	2	100%	8.9 – 16.4	1.0 – 1.4	27	100%	2.0 – 16.1	0.001 – 0.003
Kiska/Adak	1	100%	12.7 – 12.7	1.0	18	100%	1.5 – 13.0	0.002
Pacific Cod								
Amchitka	14	93%	1.0 – 7.0	0.7 – 1.5	3	100%	0.8 – 2.1	0.001
Kiska/Adak	7	57%	-0.004 – 6.7	0.7 – 1.3	2	100%	1.2 – 1.4	0.001
Halibut								
Amchitka	4	100%	1.6 – 20	1.0 – 2.2	3	100%	0.2 – 0.65	0.001 – 0.002
Kiska/Adak	3[d]	100%	3.0 – 3.4	0.8 – 0.9	1	100%	0.86	0.002
Rockweed								
Amchitka	10	100%	46 – 118	0.8 – 1.5	27	100%	29.0 – 121	0.001 – 0.002
Kiska/Adak	4	100%	60 – 121	0.9 – 1.2	18	100%	37.0 – 95	0.001 – 0.002

n = number of samples; MDC = minimum detectable concentration
[a] A more detailed summary of ^{238}U data for the 2011 sampling effort is provided in Table 13.
[b] Reference (background) area Kiska was sampled in 2004 only, whereas Adak Island was sampled in 2011 only.
[c] Maximum detections for both years are highlighted (yellow) to facilitate comparison.
[d] In 2004, 2 halibut samples were collected from Kiska island, and 1 from Rat Island.

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