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U.S. Army Garrison - Hawai'i

Mākua Marine Resources Supplemental Study Report

February 2015

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DRAFT

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USAG-HI
February 2015

Mākua Marine Resources Supplemental Study Report

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Abstract

This supplemental marine resources study is a follow-on assessment to the 2009 Marine Resources Study to further evaluate whether constituents potentially associated with military training at Mākua Military Reservation are present in samples of selected species of limu kohu (seaweed), he‘e (octopus), and loli (sea cucumber) found near Mākua Beach and relied on for subsistence by area residents. This study includes an evaluation of the potential risks to human health based on the data and information collected during this study. Finally, this study has assessed the organic and inorganic fractions of arsenic present in limu kohu, he‘e, and loli.

A total of 144 samples were collected at Mākua and two background locations (Mokulē‘ia and Ka‘ena Point) during the dry and wet seasons. The samples were analyzed for the same 42 compounds analyzed in the original 2009 Marine Resources Study. The majority of the compounds were detected at similar levels in biota collected from near Mākua Beach compared to biota collected from the two background locations. These compounds are not unique to military training and are found at both Mākua and background locations; therefore, proposed military activities are anticipated to have little influence on contaminant levels within marine resources in the Mākua nearshore or muliwai areas.

A Human Health Risk Assessment conducted using some very conservative assumptions concluded that the total cumulative risks and hazards from consumption of a combination of all three biota types were within acceptable risk and hazard levels of concern for “average” consumers. In evaluation of individual species, there were no unacceptable levels of risk calculated for consumption of loli or he‘e at either the “average” or “high-end” consumption rate. The carcinogenic risk due to the consumption of limu kohu for both the “average” and “high-end” consumer exceeded regulatory levels of concern. In order to put this risk into further perspective, an individual would have to consume approximately 2 grams of limu kohu collected only from Mākua Beach every day for 30 years in order to reach the regulatory level of concern.

This risk was primarily driven by two types of organochlorine pesticide: heptachlor and heptachlor epoxide. These two compounds were

historically used in Hawaii in large quantities for commercial agriculture, commercial and domestic pest control, and lawn and garden services. Heptachlor and heptachlor epoxide may have been used in the region in the past, but their commercial use has been banned since 1988, they have not been used at MMR in the interim, and they will not be used at MMR in the future.

Compliance with the sustainable range program at MMR and adherence to the long-term water quality monitoring program will minimize or prevent the introduction of trace amounts of heptachlor and heptachlor epoxide that may be present in soils at MMR to marine resources at Mākua Beach. Because the source of heptachlor and heptachlor epoxide at MMR has been eliminated and because implementation of BMPs will control the potential pathway for the introduction of residual heptachlor and heptachlor epoxide from MMR to the marine resources at Mākua Beach, the proposed training activities are not anticipated to pose an increased risk to human health to area residents who rely on marine resources for subsistence.

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Appendix A: Sample Collection Sheets

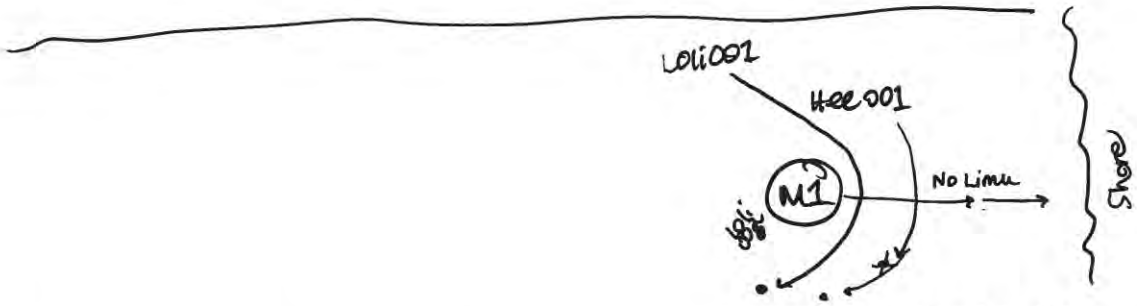
Sample Collection Sheet
2013 Marine Resources Study

Date: 9/9/13

Study Area: Makua

Segment #: 6 (boat ops)

Marker Coordinate
Lat/Long: 1: 21°32.169 ; 158° 14.076
2:
3:



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): Carl Jellings
On-board Scientist(s): Islana Kaneakua-Pia, Gui

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S6-Hee001	9/9/13 11:04	21° 32.178 / 158° 14.071	-50 ft	

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None collected				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S6-Loli 001	9/9/13 10:58	21° 32.156 / 158° 14.071	~50 ft.	
MB-S6-Loli 002	9/9/13 12:27	21° 32.151 / 158° 14.149	~50 ft.	

Sample Collection Sheet
2013 Marine Resources Study

Date: 9/9/13

Study Area: Makua

Segment #: 17 (boat ops)

Marker Coordinate
Lat/Long: 21° 30.927 / 158° 14.347

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): Cary Vellings
On-board Scientist(s): Erin, G. Lofaro

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S17-Hee002	9/9/13 13:15	21° 30.927 / 158° 14.281	~60ft	

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S17-Limu001	1250 9/9/13	21° 30.939 / 158° 13.818	~0ft	on ledge at exposed reef

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S17-Loli 003	9/9/13 1403	21° 30.953 / 158° 13.849	~28ft	
MB-S17-Loli 004	9/9/13 1403	21° 30.953 158° 13.849	~28ft	

Sample Collection Sheet
2013 Marine Resources Study

Date: 9/9/13

Study Area: Makua Beach

Segment #: 16 (boat ops)

Marker Coordinate
Lat/Long: 1: 21° 31.074 / 158° 13.935
2: 21° 30.076 / 158° 14.228

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): O. Sellings
On-board Scientist(s): IKP ; GL

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~MB-S16-Lol~~ MB-S16-Ke003	9/9/13 15:05	21° 31.071 / 158° 14.171	~60ft	

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None collected				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S16-Loli005	9/9/13 14:20	21° 31.057 / 158° 13.860	~26ft	

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Makua Beach

Marker Coordinate Lat/Long: 1: 31.518 / 13.915

Date: 9/9/13

Segment #: 12 (boat ops)

M7

loli 007 - Loli 006

More

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings

On-board Scientist(s): IKP, GL

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Not found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Not found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S12-Loli006	9/9/13 1519	21°31.524 / 158° 13.878	~15 ft	
MB-S12-Loli007	9/9/13 1522	21°31.527 / 158° 13.885	~30 ft	

Sample Collection Sheet
2013 Marine Resources Study

Date: 9/10/13

Study Area:
MAKUA Beach

Segment #: 5 and 17 →
(searching reef) Limu search (shore ops)

Marker Coordinate
Lat/Long: N/A

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): O. Jellings, Mathews, Harris, Deander
On-board Scientist(s): Eric DeCarlo, Gwen, IKP, Gail L., Danny H.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude (GPS)	Depth	Comments
MB-S17-Limu002	9/10/13 10:46	21.516279 / -158.229696	-0 ft	along ledge (see GPS) composite of multiple, like all within segment 17
~~MB-S17-Limu003~~	~~9/10/13 11:00~~	~~MKP~~ 21.515679 / -158.229672		" " "
~~MB-S17-Limu004~~	~~9/10/13 11:06~~	~~MKP~~ 21.515415 / -158.229416		" "

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Makua

Marker Coordinate Lat/Long: 21° 31.949 ~11.0 m ~~158.939~~ -158 13.939

Date: 9-11-13

Segment #: 8 (boatops)

~~Shore~~

X marker #1

- loli 008 (2 loli)
- Hee 004

Diver(s): Carl Jellings team

On-board Scientist(s): S. Koide, E. de Carlo, G. Latufo

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S8-Hee004	9-11-13 1011	21° 31.940 / -158° 13.988	~15m	Small

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S8-Loli008	9-11-13 1005	21 31.935 / -158. 13.956	~11.0m	2 loli

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-11-13

Study Area: Makua

Segment #: 7 (boat ops)

Marker Coordinate
Lat/Long: 21° 32.059 -158 14.001 ~11.1m

Shore

X marker #1

• Loli 009
• Hee005

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): Carl Jellings Team

On-board Scientist(s): S. Kolde, E. DeCarlo, G. Lotufo

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S7-Hee005	9-11-13 10:35	21° 32.033 / -158° 14.039	~14.6 m	

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S7-Loli009	9-11-13 10:30	21° 32.033 / -158° 14.037	~14.1m	

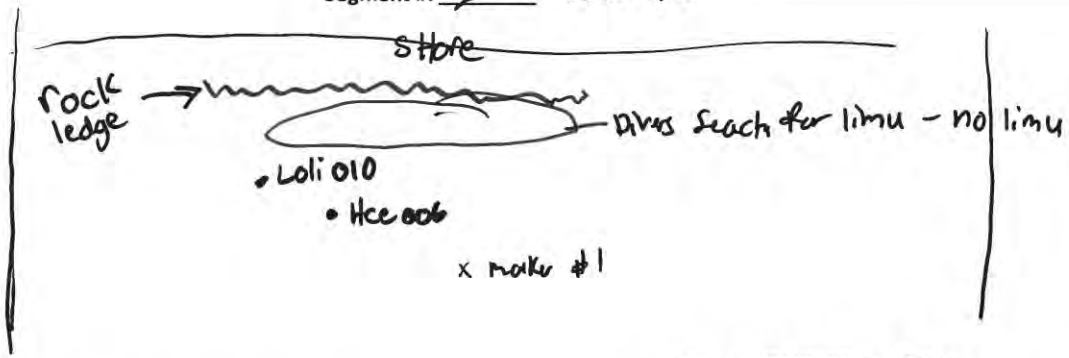
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Makua

Segment #: ~~5~~ 5 (boat ops)

Marker Coordinate
Lat/Long: 21° 32.276 / -158 14.176 12.8m

Date: 9-11-13



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koicle E. DeCarlo, G. Lotufo

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-SS-Hce006	9-11-13 1055	21° 32.298 / -158° 14.165	~10.6m	large

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu at this site				Divers Search near shore. Per Carl all Sand from marker #1 out

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-SS-Loli 010	9-11-13 1115	21° 32.313 / -158 14.156	~10.2m	

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-11-13

Study Area: Makua

Segment #: 4 (boat ops)

Marker Coordinate
Lat/Long: 21° 32.386 / -158 14.336 ~13.7 m

shore

• loli

• Hee
x marker #1

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Kade, E. DeCarlo, G. Lotufo

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S4-hee007	9-11-13 1125	21° 32.388 / -158° 14.334	~13.9 m	large

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu at this site.				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~MB-S4-hee~~				
MB-S4-loli011	9-11-13 1135	21° 32.378 / -158° 14.274	~12.0 m	

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-11-13

Study Area: Makua

Segment #: 12 (boat ops)

Revisit for Hee

Marker Coordinate
Lat/Long: 21° 31.518 / -158 13.915 10.7m
21° 31.518 / -158 14.050 17.0m

shore

x marker #1

note went to marker #1 but too cloudy the water. Move to marker #2

x marker #2 • Hee

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Korde, E. DeCarlo, G. Lotuto

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-812-Hee 008	9-11-13 1210	21° 31.461 / -158 14.040	~16.0m	Near marker #2

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate Lat/Long: N/A

Date: 9-13-13

Segment #: 11 (offshore) shore ops

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide, G. Lotufo, D. Harrelson, A. Buffkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found at this locations				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~Kp-511-loli~~				
No limu found at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude (GPS)	Depth	Comments
Kp-511-loli 012	~~9-11~~ 9-13-13 0958	21.577558 / -158.260765	~6ft	GPS point taken from rocks next to cove
Kp-511-loli 013	9-13-13 1001	" " " "	~6ft	
Kp-511-loli 014	9-13-13 1007	" " " "	~6ft	

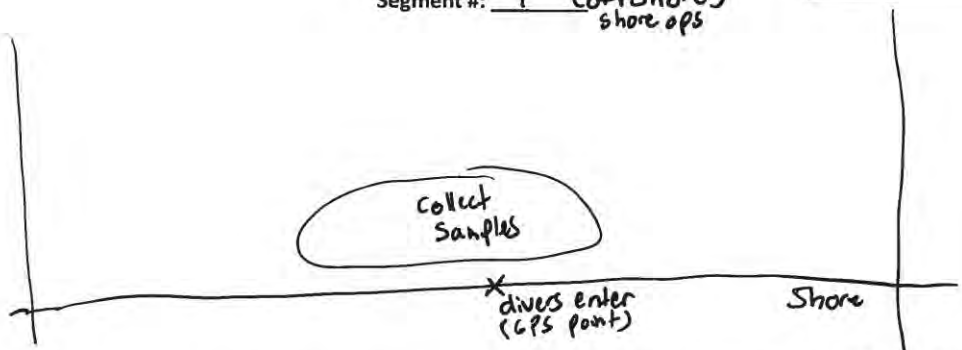
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 9-13-13

Segment #: 1 (offshore) shore ops



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide, G. Lotufo, D. Harrelson, A. Buffin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found at this location.				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S1-limu003	9-13-13 1133	21.581799 / -158.204367	~5ft	GPS point taken from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S1-loli015	9-13-13 1128	21.581799 / -158.204367	~5ft	GPS point taken from shore
MK-S1-loli016	9-13-13 1128	" " " "	~5ft	GPS point taken from shore

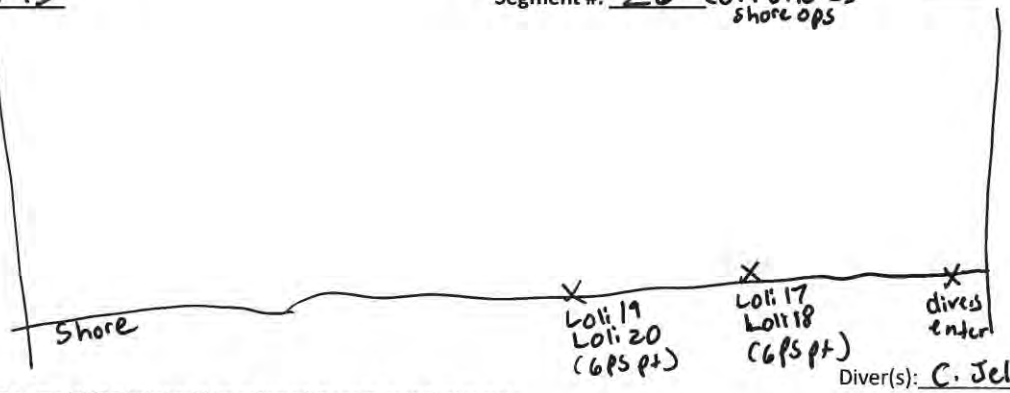
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 9-13-13

Segment #: 26 (offshore) shore ops



Diver(s): C. Jellings team

On-board Scientist(s): S. Koide, G. Lotufo, D. Harrelson, A. Bufkin

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found at this location				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S26-loli 017	9-13-13 1214	21.580828 / -158.155589	~6-7ft	GPS point taken from shore
MK-S26-loli 018	9-13-13 1216	" " " "	~6-7ft	↓
MK-S26-loli 019	9-13-13 1218	21.580752 / -158.155835	~6-7ft	
MK-S26-loli 020	9-13-13 1218	" " " "	~6-7ft	

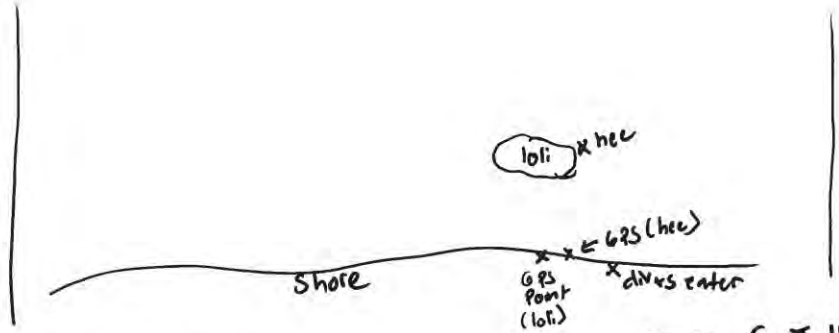
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia ~~Makua~~

Marker Coordinate Lat/Long: N/A

Date: 9-13-13

Segment #: 24 (offshore) shore ops



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Korde, G. Lotufo, D. Harrelson, A. Buffkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S24-Hee009	9-13-13 1248	21.579903 / -158.160079	~6ft	Caught off shore, GPS point taken from shore

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S24-loli 021	9-13-13 1245	21.579897 / -158.160083	~6ft	Caught off shore, GPS point taken from shore
MK-S24-loli 022	9-13-13 1245	" " " "	~6ft	↓
MK-S24-loli 023	9-13-13 1245	" " " "	~6ft	↓
MK-S24-loli 024	9-13-13 1245	" " " "	~6ft	↓

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-13-13

Study Area: Mokuleia

Segment #: 19 (offshore) Shore ops

Marker Coordinate
Lat/Long: N/A

• loli
* ← divers entered Shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Korde, G. Lotufo, D. Harrelson, A. Butkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found at this location				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-519-loli025	9-13-13 1335	21.579634 / -158.169739	~5ft	Caught off shore, GPS point taken
MK-519-loli026	9-13-13 1335	" " " "	~5ft	Caught off shore, GPS point taken

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 9-13-13

Segment #: 18 (off shore) shore ops

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide, ~~G. Lotufo~~, G. Lotufo, D. Harrelson, A. Butkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found at	this location			

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S18-limu004	9-13-13 1410	21.580841 / -158.171966	~5-6ft	Collected from reef
MK-S18-limu005	9-13-13 1420	" " " "	~5-6ft	Collected from reef

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S18-loli 027	9-13-13 ~~09~~ 1355	21.580720 / -158.171701	~6ft	caught off shore ~20ft from shore
MK-S18-loli 028	9-13-13 1355	" " " "	~6ft	caught off shore
MK-S18-loli 029	9-13-13 1355	" " " "	~6ft	caught off shore. (2 loli) ↓

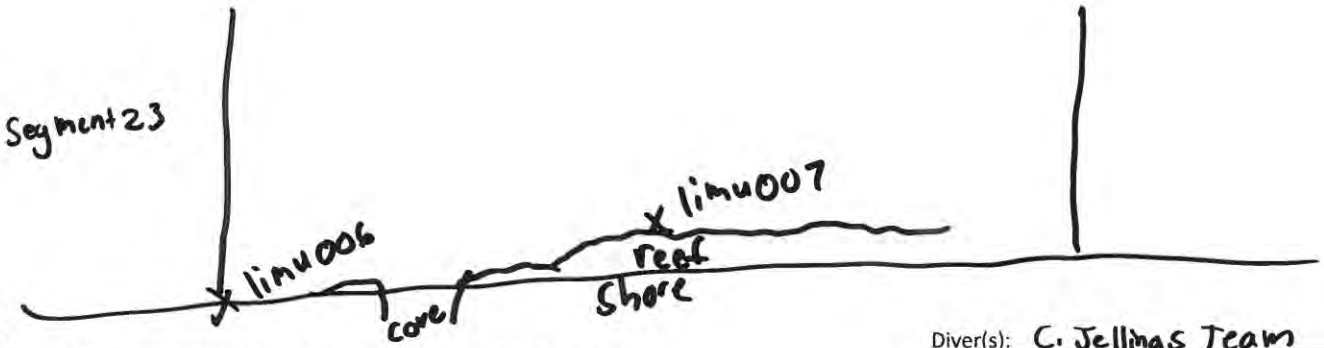
Sample Collection Sheet
2013 Marine Resources Study

Date: 9-16-13

Study Area: Kaena Point

Segment #: 24 (offshore) shore ops

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Parking lot

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide, G. Lotufo, D. Harrelson, H. Bufkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found at this location				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S24-limu006	9-16-13 0750	21.580031 / -158.237269	~0.5-1ft	on reef by parking lot
KP-S24-limu007	9-16-13 0840	21.579914 / -158.236416	~0.5-1ft	on reef; GPS points taken from Shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No loli found at this location				

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-16-13

Study Area: Kaena Point

Segment #: S26 (offshore) shore ops

Marker Coordinate
Lat/Long: N/A

• loli

*divers enter Shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jelling & Team

On-board Scientist(s): S. Kerde, G. Lotufo, D. Harrelson, A. Buffkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hec found at this location				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No ~~hec~~ limu found at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S26-loli030	9-16-13 0905	21.579483 / -158.232338	~4ft	5 loli; GPS point taken from Shore

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-16-13

Study Area: Kaena Point

Segment #: 26+ (offshore) shore ops
100 m Past Seg. 26

Marker Coordinate
Lat/Long: N/A

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Korde, G. Lotufo, D. Harrelson, A. Bufkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found at	this location			

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S26+-limu008	9-16-13 0920	21.579103 / -158.230377	-0.5-1ft	GPS point taken from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~KP-S26+-limu~~				
KP-S26+-loli031	9-16-13 0915	21.579103 / -158.230377	-0.5-1ft	4 loli; GPS point taken from shore

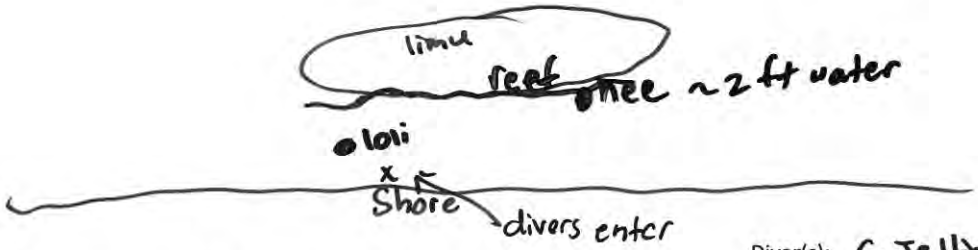
Sample Collection Sheet
2013 Marine Resources Study

Date: 9-16-13

Study Area: Mokuleia

Segment #: 16 (offshore) shore ops

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Kordc, G. Lotufo, D. Harrelson, A. Butkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S16-hee 010	9-16-13 1025	21.581147 / -158.175188	~2ft	GPS point taken from Shore

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S16-limu 009	9-16-13 1040	21.581051 / -158.175385	~2-3ft	GPS point taken from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S16-loli 032	9-16-13 1018	21.581051 / -158.175385	~2ft	4 loli; GPS point taken from Shore

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-16-13

Study Area: Mokuleia

Segment #: 10 (off shore) shore ops

Marker Coordinate
Lat/Long: N/A

search for limu and collect sample (limu 010)
• hee

• loli 033 034

→ shore
divers enter water

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide, G. Lotufo, D. Harrelson, A. Butkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S10-hee011	9-16-13 1110	21.582277 / -158.187190	~3ft	~50 ft off shore; GPS point taken from shore

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S10-limu010	9-16-13 1140	21.582277 / -158.187190	~3ft	~50 ft off shore; GPS point taken from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S10-loli033	9-16-13 1105	21.582250 / -158.187216	~3ft	~20 ft off shore; GPS point
MK-S10-loli034	9-16-13 1116	" " " "	~3ft	~20ft off shore; GPS point, 2 loli

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-16-13

Study Area: Mokuleia

Segment #: 9 (offshore) shore ops

Marker Coordinate
Lat/Long: N/A

Search limu and hee ~60ft from shore

• loli ~ 2-3ft water

divers enter shore

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide, G. Lotuto, D. Harrelson, A. Burkin

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee at this location				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found at this location.				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S9-loli 035	9-16-13 1150	21.582628 / -158.189194	~2-3ft	~20 ft from shore 2 loli GPS point
MK-S9-loli 036	9-16-13 1155	" " " "	~2-3ft	~20-30 ft from shore. from shore
				~~2 loli~~

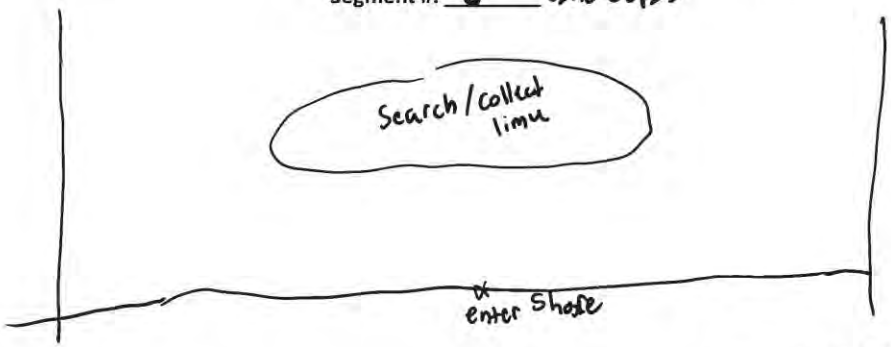
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 9-16-13

Segment #: 8 (shore ops)



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jennings Team

On-board Scientist(s): S. Korde, G. Lotufo, D. Harrelson, A. Burkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee at this location				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S8-Limu011	9-16-13 1320	21.582754 / -158.191196	-6.8ft	GPS point from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Loli Collection Completed. No loli Collected from this site.				

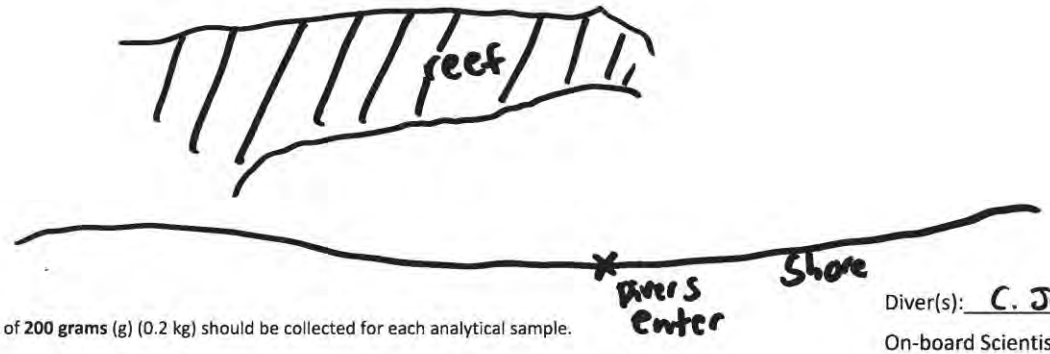
Sample Collection Sheet
2013 Marine Resources Study

Date: 9-16-13

Study Area: Mokuleia

Segment #: 6 (shore ops)

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings
On-board Scientist(s): S. Keide, G. Lotuf, D. Harrelson, A. Burkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hec found at this location				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S6-Limu012	9-16-13 1410	21.581479 / -158.195415	~6 ft	GPS point from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Loli Collection Completed. No samples collected from this location				

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-16-13

Study Area: Mokuleia

Segment #: 4 (offshore) shore ops

Marker Coordinate
Lat/Long: N/A

— limu
divers enter shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide, G. Lotufo, P. Harrelson, A. Burkin

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found at this location				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S4-limu013	9-16-13 1433	21.582076 / -158.198123	~1-2ft	~2-3ft offshore; GPS point taken from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Loli Collection Completed. No loli samples collected from this location.				

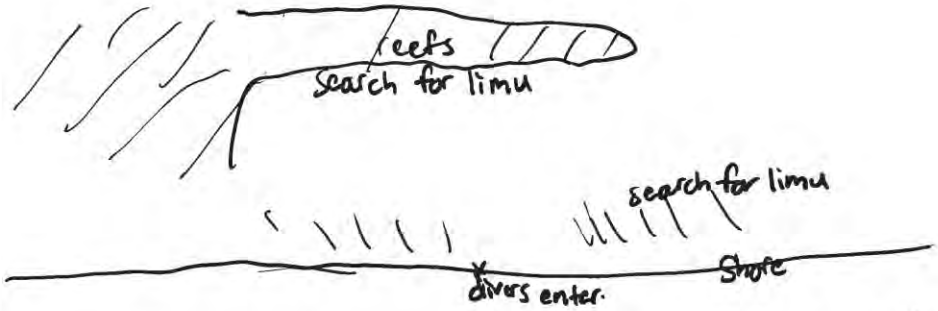
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 9-16-13

Segment #: 3 (shore ops)



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide, G. Latufo, D. Harrelson, A. Burkh

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hre found at this location				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S3-limu014	9-16-13 1515	21.582670 / -158.200319	~3-4ft	~60-70ft offshore GPS point taken from shore
MK-S3-limu015	9-16-13 1518	" " " "	~3-4ft	~60-70ft offshore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Loli Collection Completed. No loli Samples collected from this location				

Sample Collection Sheet
2013 Marine Resources Study

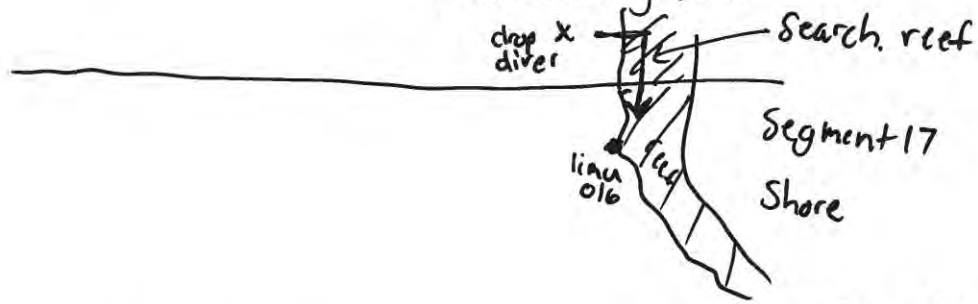
Study Area: Makua

Marker Coordinate
Lat/Long: N/A

Date: 9-18-13

Segment #: 17+ (boat ops)

~30-40m South Segment 17



Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S17+ - limu 016	9-18-13 0750	21.515141 / -158.229884	0ft	GPS point from boat

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

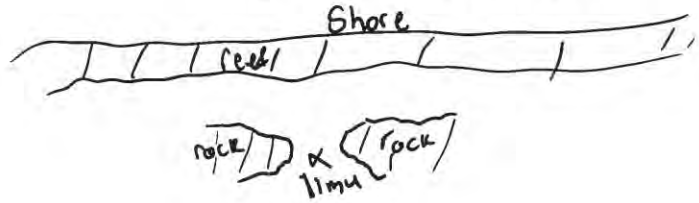
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Makua

Marker Coordinate
Lat/Long: N/A

Date: 9-23-13

Segment #: 3 (boat ops)



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Kordle

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S3-limu 023	9-23-13 13:00	21.542256 / -158.237774	~0.05ft	on reef between rocks; point taken w/ GPS from boat

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 9.22-13

Segment #: 26 (boat ops)

Seg 26

• boat marker (GPS)

~hce 1 loli

• Marker 1

~0815 divers drop

~0830 divers surface

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koiele

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S26-hec012	9-22-13 0830	21.588850 / -158.153983	~55ft	Found by ~~reverse~~ reverse ledge

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S26-loli037	9-22-13 0830	21.588850 / -158.153983	~55ft	3 loli

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-22-13

Study Area: Mokuleia

Segment #: 20 (boat ops)

Marker Coordinate
Lat/Long: N/A

• Marker #2

• drop divers (GPS point)

Divers drop ~840
Surface ~~0905~~ 0906

x loli

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Kaide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				No hee coral reefs smooth bubbuhamu

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-820-loli 038	9-22-13 0906	21.591151 / -158.168632	~75ft	

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-22-13-13

Study Area: Mokuleia

Segment #: 21 (boat ops)
x markers

Marker Coordinate
Lat/Long: N/A

Seg 20

• Divers drop search for hee.
- like Kaneohe bay reef

0910 - divers drop
Search hee
0950 Surface.

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.
x markers 1

Diver(s): C. Jellings Team
On-board Scientist(s): S. Kaide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found at this location				No hee

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 9-22-13

Segment #: 14 (13 (boat ops)

③ 1046 drop divers
1115 Surface hce

x marker 2
* drop divers #3

① Divers Drop 10:00
drop divers #1 Surface 1018
Kloli

② 1023 drop Shallow
water dirty
1036 Surface

drop #2

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Kaide

marker #1

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-513-hce013	9-22-13 1115	21.591206 / -158.181055	~90ft	Small holes Found during drop #3

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-514-loli039	9-22-13 1018	21.590338 / -158.178587	~40ft	Found during drop #1

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-22-13

Study Area: Makua

Segment #: 8 (boat ops)
x Marzu #2

Marker Coordinate
Lat/Long: N/A

x drop

11:26 - divers drop
1140 Surface

surface
• hee, loli

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-58-Hee014	9-22-13 1140	21.591855 / -158.191819	~~30ft~~ 50ft	

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-58-loli 040	9-22-13 1140	21.591855 / -158.191819	~50ft	(2 loli)
MK-58-loli 041	9-22-13 1140	" " " "	~50ft	

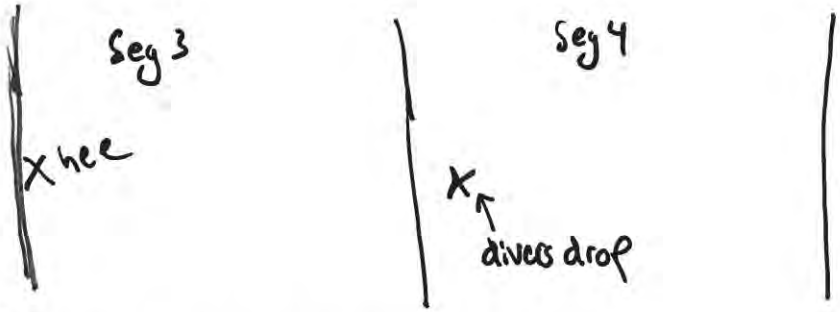
Sample Collection Sheet
2013 Marine Resources Study

Date: 9-22-13

Study Area: Makuleia

Segment #: ~~2~~ 4-3 (boat ops)

Marker Coordinate
Lat/Long: N/A



1150 divers drop in segment 4

1206 Surface Seg3
~~1149~~

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~MK~~-S3-hec015	9-22-13 1206	21.591384 / -158.201614	~40ft	
MK-S3-hec016	9-22-13 1206	" " " "	~40ft	

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate
Lat/Long: N/A

Date: 9-22-13

Segment #: 26 ft (boat ops)

Seg 26
• marker 2

surface #1 limu, loli (about 200 m east Seg 26)
x x - drop #1

~1215 drop #1
1300 Surface #1
1315 Surface #2

• marker 1

x Surface #2 hce (~100 m east Seg 26)

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings
On-board Scientist(s): S. Korde

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-26ft-~~limu~~ hce ~~016~~ 017	9-22-13 1315	21.588322 / -158.229964	~70ft	Drop 2

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-26ft-limu017	9-22-13 1300	21.589770 / -158.228802	~80ft	Drop #1

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S26ft-Loli042	9-22-13 1300	21.589770 / -158.228802	~80ft	Drop #1

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-22-13

Study Area: Kaena Point

Segment #: 25 / 24 (boat ops)

Marker Coordinate
Lat/Long: N/A

Seg 24

x divers surface (hee, limu)
• Marker 1

Seg 25

x divers drop
• Marker 1

Divers drop 1319
Surface - 1400

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S24-hee018	9-22-13 1400	21.587853 / -158.236921	~40ft	

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S24-limu018	9-22-13 1400	21.587853 / -158.236921	~40ft	

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No loli found				

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-23-13

Study Area: Kaena Point

Segment #: 24b (boat ops)

Marker Coordinate
Lat/Long: N/A

Seg. 24b

x Surface (hee, loli)

x drop

• Marker #1

Divers drop 0808
Surface 0820
0833 dh

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~KP-24b-hee019~~ dh	9-23-13 0820	21.588184 / -158.236598	~55ft	Point taken w/ GPS
KP-S24b-hee019				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
dh ~~KP-S23-loli044~~	9-23-13 0820	21.588184 / -158.236598	~55ft	point taken w/ GPS
KP-S24b-loli043				

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-23-13

Study Area: Kaena Point

Segment #: 23 (boat ops)

Marker Coordinate
Lat/Long: N/A

x divers drop.
x surface (hee, loli)

Divers drop 0825
Surface 0833

• Marker #1

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-523-hee 020	9-23-13 0833	21.588 182 / - 158.238 117	~50ft	point taken w/ GPS

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-523-loli 044	9-23-13 0833	21.588 182 / - 158.238 117	~50ft	point taken w/ GPS

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-23-13

Study Area: Kaena Point

Segment #: 21 (boat ops)

Marker Coordinate
Lat/Long: N/A

x surface. (hec, limu)
x drop

Divers drop 0840
Surface 0900

• maiverst /

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Kaiele

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S21-~~02~~ hec021	9-23-13 0855	21.587961 / -158.242630	~60ft	point taken w/ GPS
KP-S21-hec022	9-23-13 0900	" " " "	~60ft	point taken w/ GPS

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S21-limu019	9-23-13 0900	21.587961 / -158.242630	~60ft	point taken w/ GPS

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No loli at this location				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate
Lat/Long: N/A

Date: 9-23-13

Segment #: 19 (boat ops)

Drop 0902
Surface 0945

. markall
Search limu
Valley found limu
x drop

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S19-hcc023	9-23-13 0927	21.586853 / -158.245374	~45ft	Small

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S19-limu020	9-23-13 0945	21.586853 / -158.245374	~50ft	found ~~in~~ little valley hot much limu

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No loli found at this location				

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-23-13

Study Area: Kaena Point

Segment #: 16 (boat ops)

Marker Coordinate
Lat/Long: N/A

* Marker #1

x drop

Drop 0950
Surface 1020

x surface (hee, linu)

Diver(s): C. Jellings Team

On-board Scientist(s): S. Kaide

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S16-hee024	9-23-13 1020	21.584158 / -158.251064	~50ft	point taken w/ GPS

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S16-linu021	9-23-13 1020	21.584158 / -158.251064	~50ft	point taken w/ GPS

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No loli at this location			~50ft	point

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate
Lat/Long: N/A

Date: 9-23-13

Segment #: 14/13 (boat ops)

Seg 13
• Marker 1
*hell, surface #2
x drop #2
x Surface #1 loli
~~* surface ~~ ~~# 1 loli~~

Seg 14
• Marker 1
x drop #1

#1 Divers drop 1030 (Seg 14)
#1 Surface ~~1038~~ 1050 (Seg 13)
#2 Drop 1055 (Seg 13)

Show

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S13-hec025	9-23-13 ~~1136~~ 1136	21.585409 / -158.257806	~90ft	

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S13-loli045	9-23-13 1050	21.583184 / -158.258347	~80ft	

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate
Lat/Long: N/A

Date: 9-23-13

Segment #: 24/23 (boat ops)

Seg 23

Bore limu / loli Search
Seg 24

drop limu/loli Search
* collect
surface

1153 drop
1210 surface

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Kotake

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-523524-~~lol.046~~ limu022	9-23-13 1210	21.588378 / -158.237566 (begin)	~50 ft	
		21.588207 / -158.237183 (end)		

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-523524-loli.046	9-23-13 1210	21.588378 / -158.237566 (begin)	~50 ft	
		21.588207 / -158.237183 (end)		

Sample Collection Sheet
2013 Marine Resources Study

Date: 9-27-13

Study Area: Mokuleia

Segment #: 23 (boat ops)

Marker Coordinate
Lat/Long: N/A

• Marker #2

Diver drop: 0823

Surface: 0828

X ← diver drop

X hee 026

• Marker #1

Diver(s): C. Jellings Team

On-board Scientist(s): S. Kaidl

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S23-hee 026	9-27-13 0828	21.588672 / -158.162160	~40ft	GPS point taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Makua

Segment #: 3-4 ~~5~~ (boat ops)

Marker Coordinate
Lat/Long: N/A

Date: 9-27-13

No limu found during diver search

Begin:
Reef Search: 0925
water Search: 0930

Surface: 1017

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S354-limu024	9-27-13 0955	21.540478 / -158.236783	-0ft	on reef; collected from walking reef GPS point taken from boat

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Makua

Date: 9-27-13

Segment #: 1+ (boat ops)

Marker Coordinate
Lat/Long: N/A

Diver(s): C. Jelling & Team

On-board Scientist(s): S. Kade

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

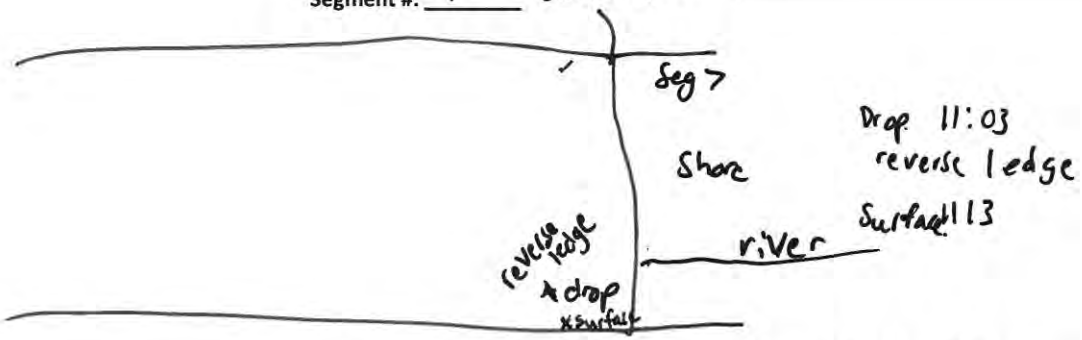
Sample Collection Sheet
2013 Marine Resources Study

Date: 9-27-13

Study Area: Makua

Segment #: 7 (boat ops)

Marker Coordinate Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
NA				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found at this location				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

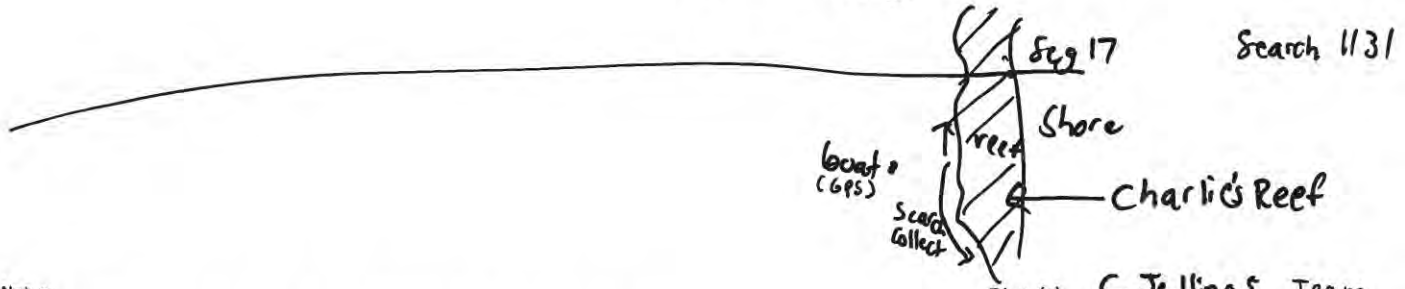
Sample Collection Sheet
2013 Marine Resources Study

Date: 9-27-13

Study Area: Makua

Segment #: 17 ttpast ~30m (Charlie's reef)

Marker Coordinate
Lat/Long: N/A
(boat ops)



Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S17tt-Limu025	9-27-13 1255	21.515042 / -158.230352	~0-1ft	
MB-S17tt-Limu026	9-27-13 1255	" " " "	~0-1ft	
MB-S17tt-Limu027	9-27-13 1255	" " " "	~0-1ft	
MB-S17tt-Limu028	9-27-13 1255	" " " "	~0-1ft	

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

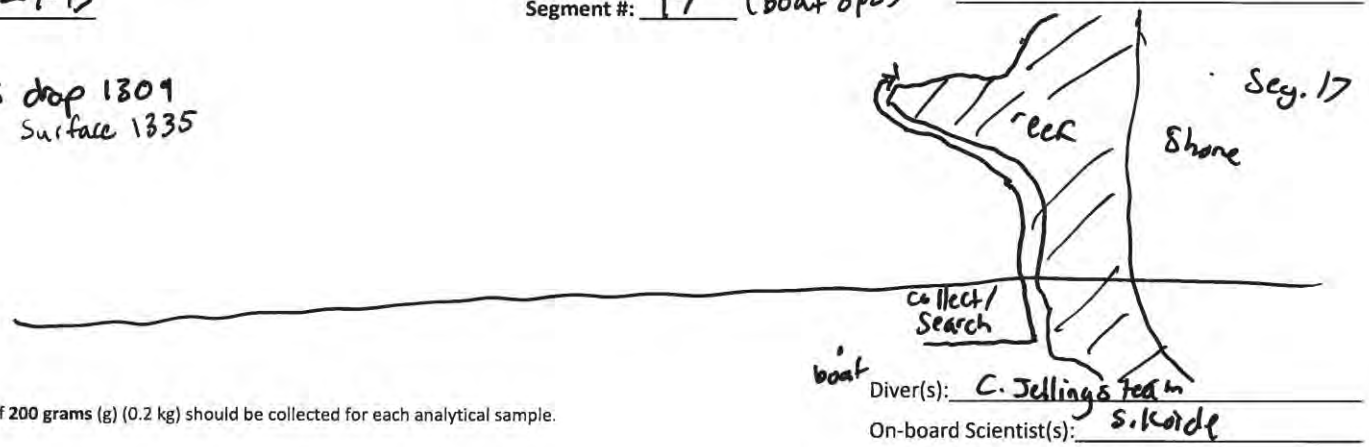
Study Area: Ma Kua

Marker Coordinate
Lat/Long: N/A

Date: 9-27-13

Segment #: 17 (boat ops)

Divers drop 1309
Surface 1335



Diver(s): C. Jellings team

On-board Scientist(s): S. Koide

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S17-limu029	9-27-13 1335	21.516411 / -158.230227	-0-1ft	

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

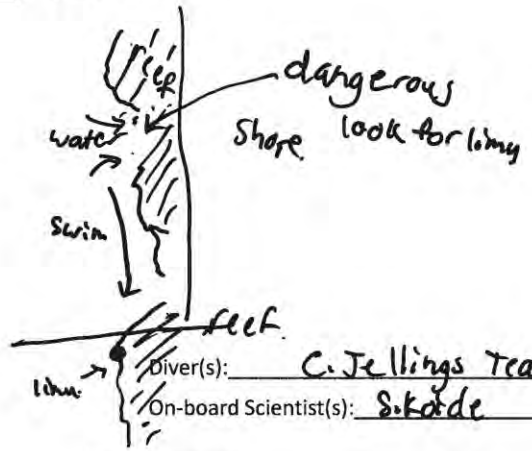
Sample Collection Sheet
2013 Marine Resources Study

Date: 9-27-13

Study Area: Makua

Segment #: 3-4 (boat ops)

Marker Coordinate
Lat/Long: N/A



Diver(s): C. Jellings Team

On-board Scientist(s): Sikaide

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-5354-limu030	9-27-13 1500	21.541989 / -158.237860	-0ft	on reef.

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Date: 10-11-13

Seg 26

Marker #1

Study Area: ~~Kokuleia~~ Kaena Point

Segment #: 26++ limu Search (boat ops)

Marker Coordinate
Lat/Long: N/A

#1 Diver drop :0857
Diver surface 0950
0955

Drop #2 1000
Surface 1050

x drop #2
• limu 033, 034, 035 (Surface #2)

• limu 031 (surface #1)
• limu 032 (Surface #1) x divers drop #1

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Korde

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S26++-limu031	10-11-13 0950	21.585907 / -158.230426	~30-40ft	GPS point, ~380g w/sand
KP-S26++-limu032	10-11-13 0955	21.585719 / -158.230490	~30-40ft	GPS point, ~300g w/sand
KP-S26++-limu033	10-11-13 1050	21.586999 / -158.230394	~30-40ft	GPS point, ~400g w/sand
KP-S26++-limu034	10-11-13 1050	" " " "	~30-40ft	GPS point, ~660g w/sand
KP-S26++-limu035	10-11-13 1050	" " " "	~30-40ft	GPS point, ~880g w/sand

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate Lat/Long: N/A

Date: 10-11-13

Segment #: 21 (boat ops)

• marker #1

x drop #1

Divers Drop 12:00
Surface: 1220, 1222

(Surface #1)
limu 036, 037

Drop #2: 1225
Surface: 1301

drop x #2
(Surface #2)
limu 038, limu 039, limu 040

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings team

On-board Scientist(s): S. Kaide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S21-limu036	10-11-13 1220	21.586311 / -158.241048	~50-60ft	GPS point; ~160 w/sand
Kp-S21-limu037	10-11-13 1222	" " " "	~50-60ft	GPS point; ~100g w/sand
Kp-S21-limu038	10-11-13 1301	21.585924 / -158.241970	~50-60ft	GPS point; 50g w/sand
Kp-S21-limu039	10-11-13 1301	" " " "	~50-60ft	GPS point; 390g w/sand
Kp-S21-limu040	10-11-13 1301	" " " "	~50-60ft	GPS point; 570g w/sand

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate
Lat/Long: N/A

Date: 10-11-13

Segment #: 15-16 (boat ops)

Seg 15

• marker #1

Seg 16

drop: 1310
Surface: 1400

x drop #1

• limu 041-044
surface

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jollings Team

On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S16-Limu 041	10-11-13 1400	21.583140 / -158.252146	~40ft	GPS point, ~300g w/ sand
KP-S16-limu 042	10-11-13 1400	" " " "	~40ft	GPS point, ~580g w/ sand
KP-S16-limu 043	10-11-13 1400	" " " "	~40ft	GPS point, ~560g w/ sand
KP-S16-limu 044	10-11-13 1400	" " " "	~40ft	GPS point, ~1,070g w/ sand

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

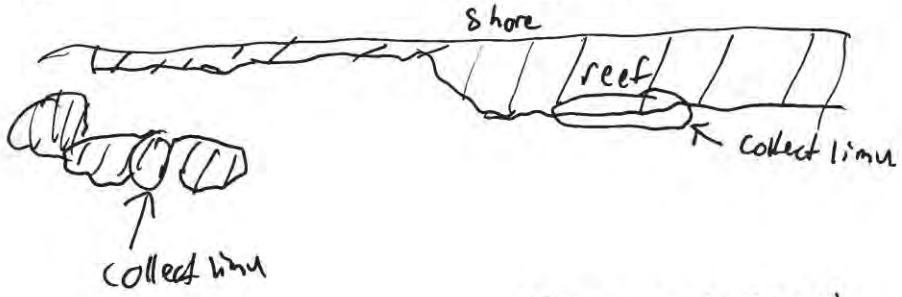
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Makua

Marker Coordinate
Lat/Long: N/A

Date: 10-11-13

Segment #: 3 (boat ops)



Divers begin collecting/search 1435

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Kolde

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S3-limu045	10-11-13 1505	21.541371 / -158.237278	~0.1ft	> 1,000 g (gallon bag), GPS point at boat

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

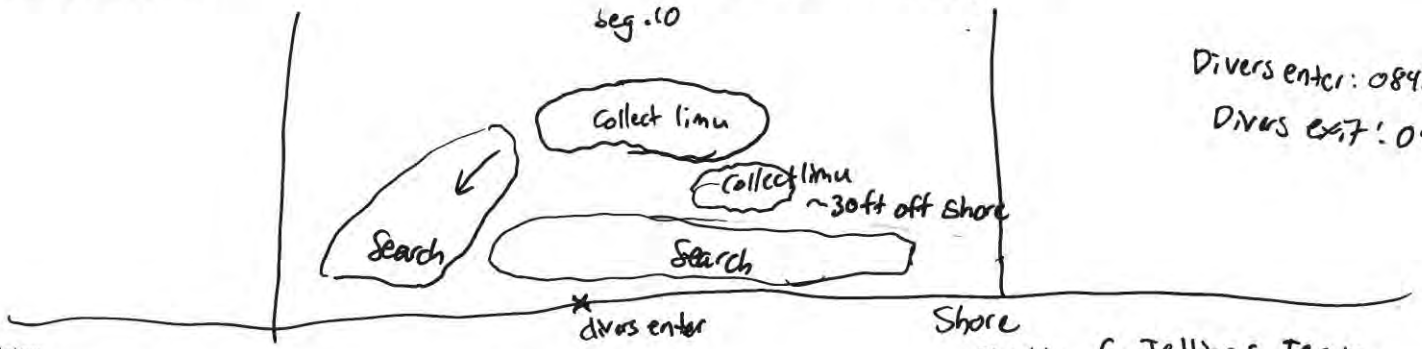
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 10-15-13

Segment #: 10 (shore ops)



Divers enter: 0840
Divers exit: 0925

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S10-limu046	10-15-13 0925	21.582365 / -158.187430	~2ft	small patches; ~1,410 g w/seed; GPS point from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

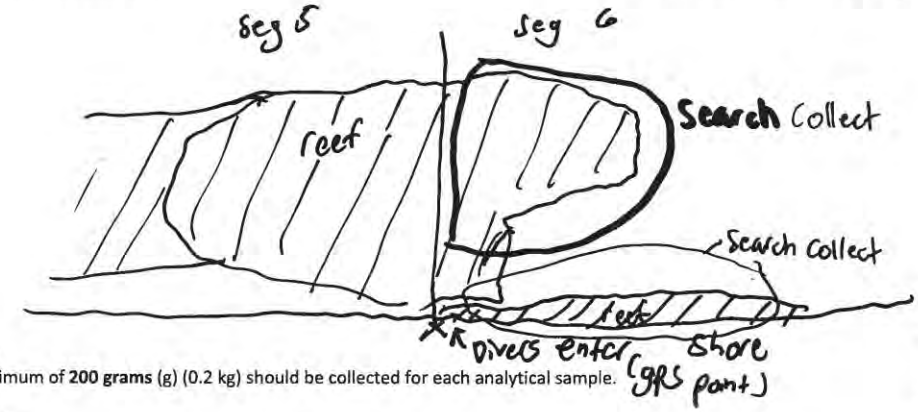
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 10-15-13

Segment #: G-5 (Shore ops)



Divers enter: ~~0955~~ 0955

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S6-limu047	10-15-13 1025	21.581622 / -158.195935	-1-3ft	more limu at reef along shore; GPS point from shore Field weight >1,000g w/Sand

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 10-15-13

Segment #: 1 (shore ops)

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S1-limu048	10-15-13 1105	21.581888 / -158.204715	~1-2 ft	>1,000 ~~kg~~ g w/ sand; GPS point from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2013 Marine Resources Study

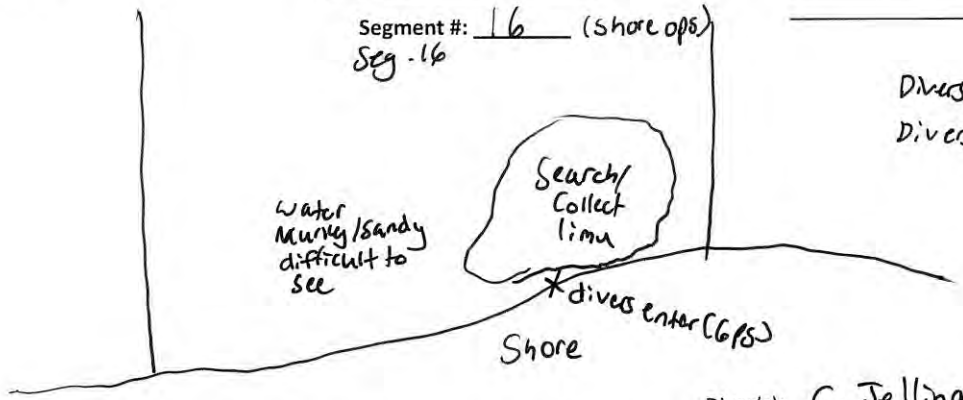
Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 10-15-13

Segment #: 16 (shore ops)
Seg. 16

Divers enter 1132
Divers exit 1158



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S16-limu049	10-15-13 1158	21.581154 / -158.175123	~2-3ft	>1,000 g w/ sand ; GPS point from shore
MK-S16-limu050	10-15-13 1158	" " " "	~2-3ft	~560 g w/ sand

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

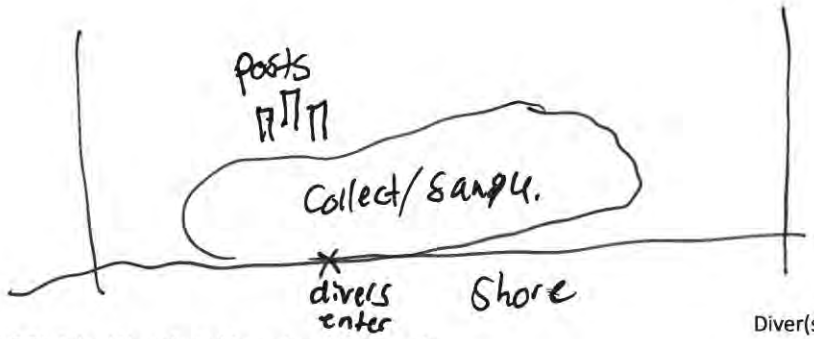
Sample Collection Sheet
2013 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 10-15-13

Segment #: 18 (shore ops)



Divers Enter: ~1208

Divers Exit: 1225

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S18-limu051	10-15-13 1225	21.580907 / -158.172259	-3ft	>1,000 g w/ Sand; GPS point
MK-S18-limu052	10-15-13 1225	" " " "	-3ft	~800 g w/ Sand from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

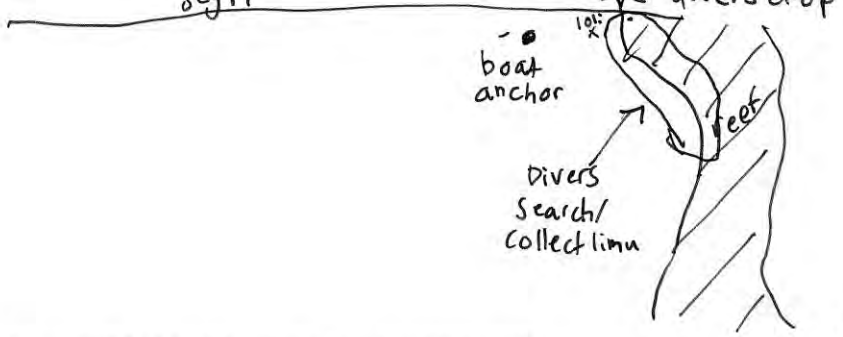
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: 1-13-14

Study Area: Makua

Segment #: 17+ Charlie's Reef

Marker Coordinate
Lat/Long: N/A



Divers drop: 0815
Divers surface: ~~0910~~ 0910

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found		~~21.514985 / -158.230117~~		

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S17+-limu101	1-13-14 0910	21.514985 / -158.230117	0+0.5 ft	1 gallon bag full, GPS point taken at diver drop, collected from reef

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S17+-loli101	1-13-14 0910	21.514985 / -158.230117	17 ft	Field weight ~850g, GPS point taken

Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: 1-13-14

Study Area: Makua

Segment #: 15

Marker Coordinate
Lat/Long: N/A

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S15-hee101	1-13-14 0920	21.519935 / -158.231214	20ft	Small, Field weight ~500g, GPS pt. taken
MB-S15-hee102	1-13-14 1002	21.519654 / -158.230449	20ft	~640g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S15-limu102	1-13-14 1002	21.519654 / -158.230449	20ft	~820 g w/sand, GPS Pt. Taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S15-loli102	1-13-14 1002	21.519654 / -158.230449	20ft	~720g, GPS pt. taken

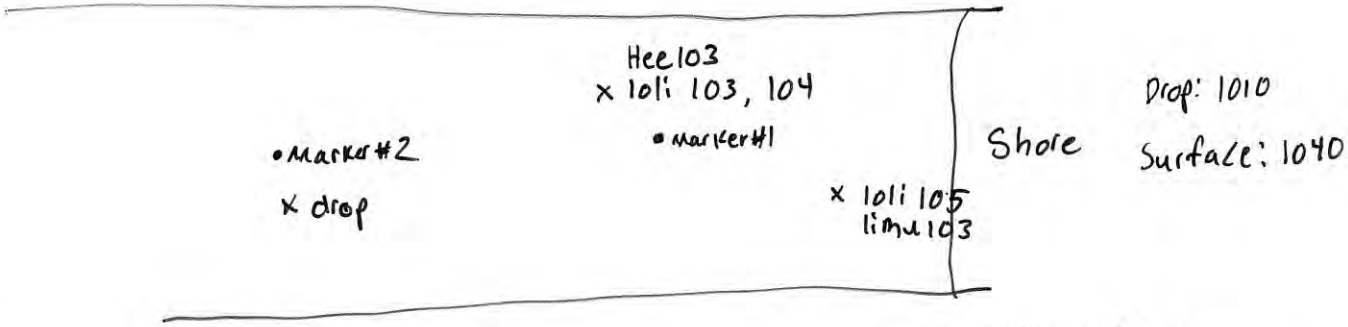
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Study Area: Makua

Marker Coordinate
Lat/Long: N/A

Date: 1-13-14

Segment #: 11



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S11-hee 103	1-13-14 1030	21.527235 / -158.231754	25ft	~320g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S11-limu 103	1-13-14 1040	21.526901 / -158.230246	30ft	too small sample, GPS pt. taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S11-loli 103	1-13-14 1022	21.527260 / -158.231744	25ft	600g, GPS pt. taken
MB-S11-loli 104	1-13-14 1030	21.527235 / -158.231754	25ft	530g GPS pt. taken
MB-S11-loli 105	1-13-14 1040	21.526901 / -158.230246	30ft	4 loli GPS pt. taken

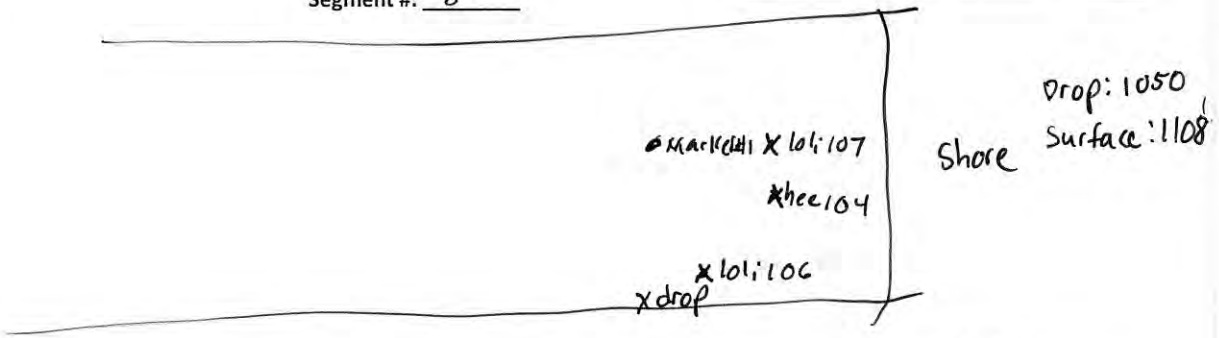
2014 ~~2013~~ Sample Collection Sheet
Marine Resources Study

Date: 1-13-14

Study Area: Makua

Segment #: 8

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S8-hee 104	1-13-14 1102	21.532230 / -158.231182	35-40ft	~590g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S8-loli 106	1-13-14 1100	21.531762 / -158.231814	35-40ft	~890g, GPS pt. taken
MB-S8-loli 107	1-13-14 1108	21.532579 / -158.231537	35-40ft	~660g, GPS pt. taken

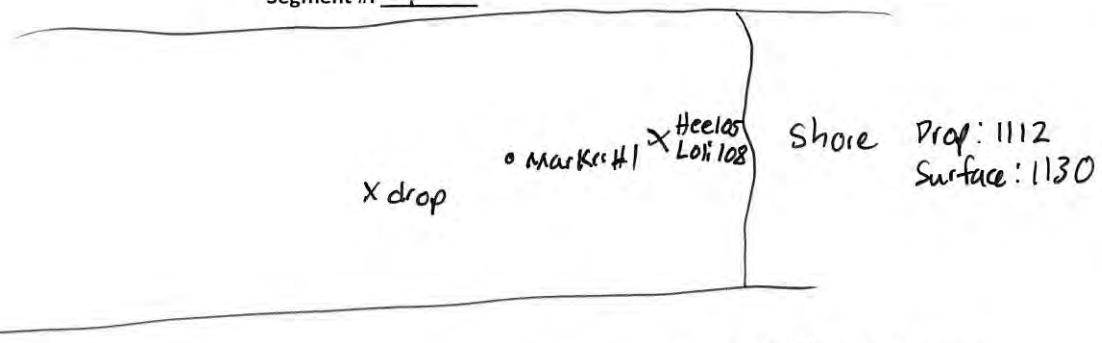
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: ~~1-14-14~~ 1-13-14

Study Area: Makua

Segment #: 7

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S7-hee 105	1-13-14 1130	21.534416 / -158.232106	30ft	large, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S7-loli108	1-13-14 1130	21.534416 / -158.232106	30ft	~870g, GPS pt. taken

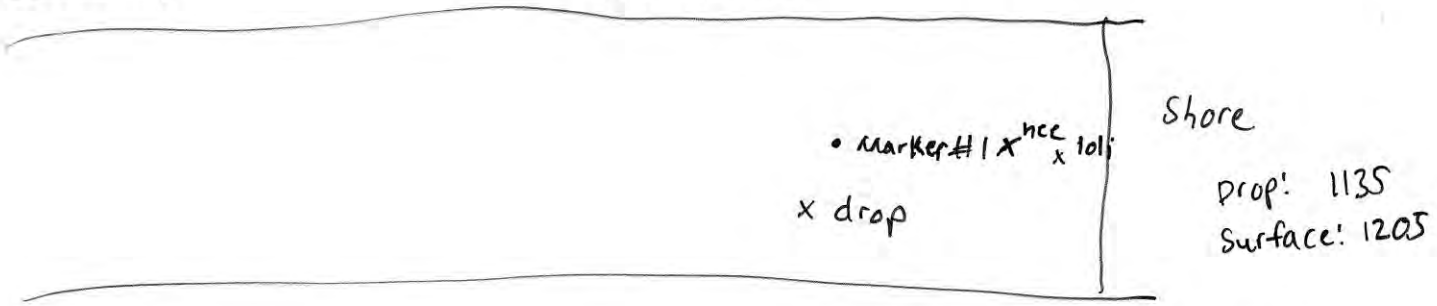
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: 1-13-14

Study Area: Makua

Segment #: 5

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-SS-hee 106	1-13-14 1158	21.538025 / -158.234728	20ft	large, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~MB-SS-loli 110~~				
MB-SS-loli 109	1-13-14 1205	21.538025 / -158.233604	20ft	~460g, GPS pt. taken

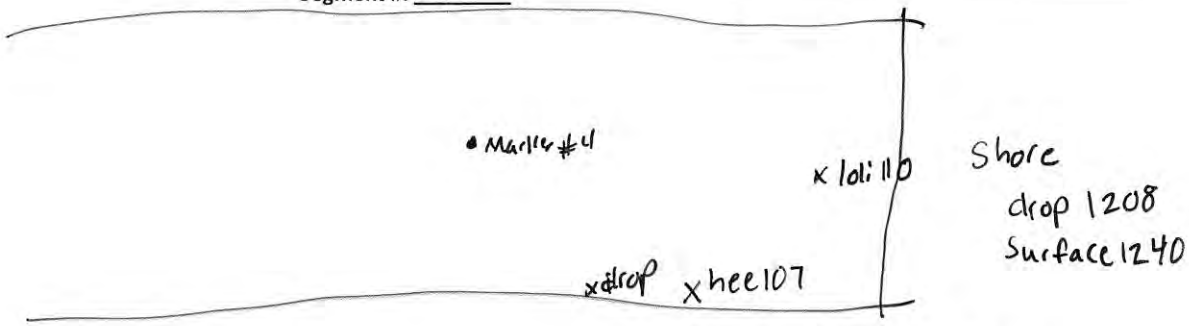
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: 1-13-14

Study Area: Makua

Segment #: 4

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Kaide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S4-hee107	1-13-14 1220	21.538970 / -158.236960	30 ft	large, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S4-loli110	1-13-14 1240	21.539488 / -158.236551	20ft	~ 810g, GPS pt. taken

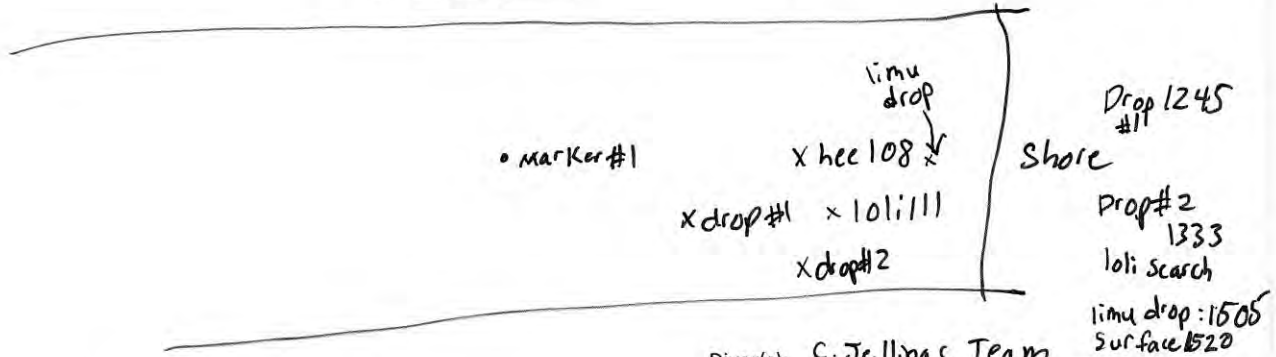
Sample Collection Sheet
2014~~2013~~ Marine Resources Study

Date: 1-13-14

Study Area: Makua

Segment #: 3

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S3-hec108	1-13-14 1305	21.541534 / -158.238456	30-40ft	large, GPS pt taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S3-limu105	1-13-14 1520	21.541335 / -158.237356	0ft	830g, GPS pt taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S3-loli111	1-13-14 1350	21.541027 / -158.238178	24ft	GPS pt. taken

Sample Collection Sheet

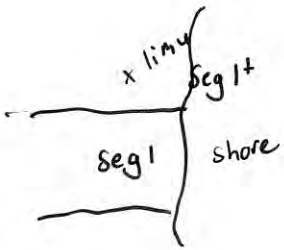
2014 ~~2013~~ Marine Resources Study

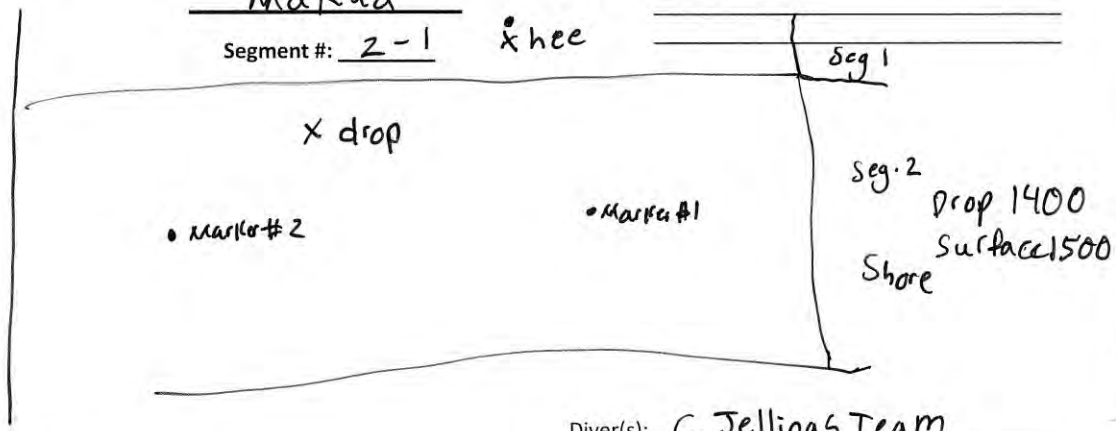
Study Area: Makua

Marker Coordinate Lat/Long: N/A

Date: 1-13-14

Segment #: 2-1





Notes:

- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S1-hee109	1-13-14 1420	21.544824 / -158.244449	32ft	large, GPS pt taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S1+-limu104	1-13-14 1500	21.546732 / -158.241842	18ft	~190g w/sand, GPS pt taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No loli found				

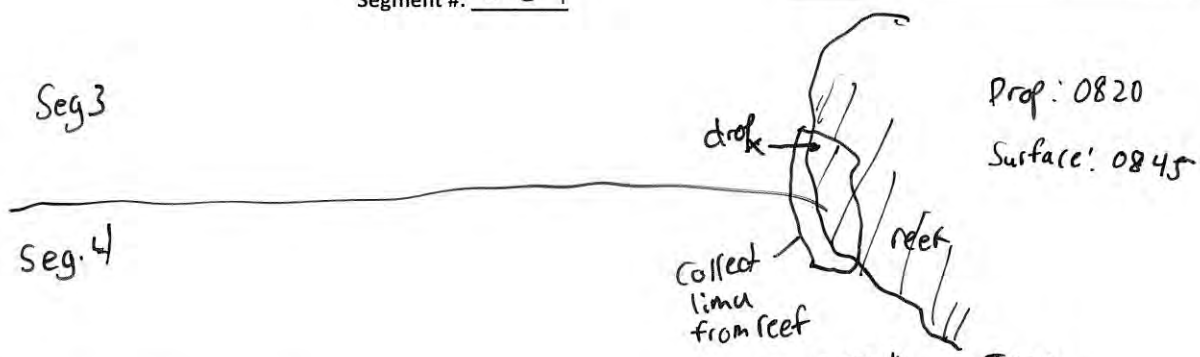
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: 1-14-14

Study Area: MaKua

Segment #: S354

Marker Coordinate
Lat/Long: N/A



Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S354-limu106	1-14-14 0845	21.541370 / -158.237226	off-0.5ft	~710g, GPS pt. taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No loli				

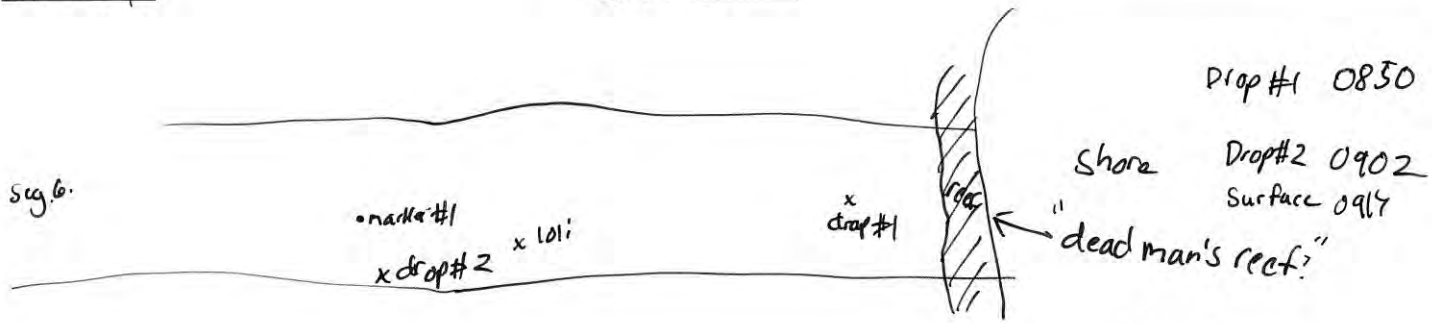
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: 1-14-14

Study Area: Makua

Segment #: 6

Marker Coordinate Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S6-loli 1/2	~~1-13-14~~ 1-14-14 0917	21.535244 / -158.234799	20ft	~660 g, GPS pt. taken

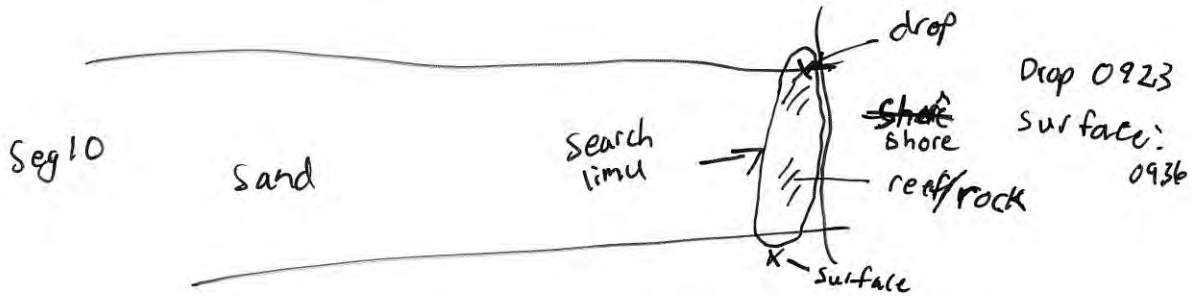
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: 1-14-14

Study Area: Makua

Segment #: 10

Marker Coordinate Lat/Long: N/A



Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found.				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

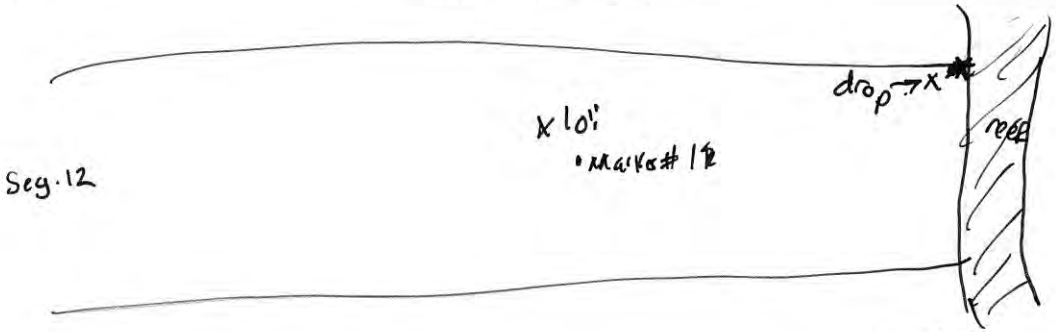
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: 1-14-14

Study Area: Makua

Segment #: 12

Marker Coordinate
Lat/Long: N/A



Drop: 0940
Surface: 0955

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings team
On-board Scientist(s): S. Kride

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S12-loli113	1-14-14 0955	21.525602 / -158.232493	45ft	~1,200g GPS pt. taken

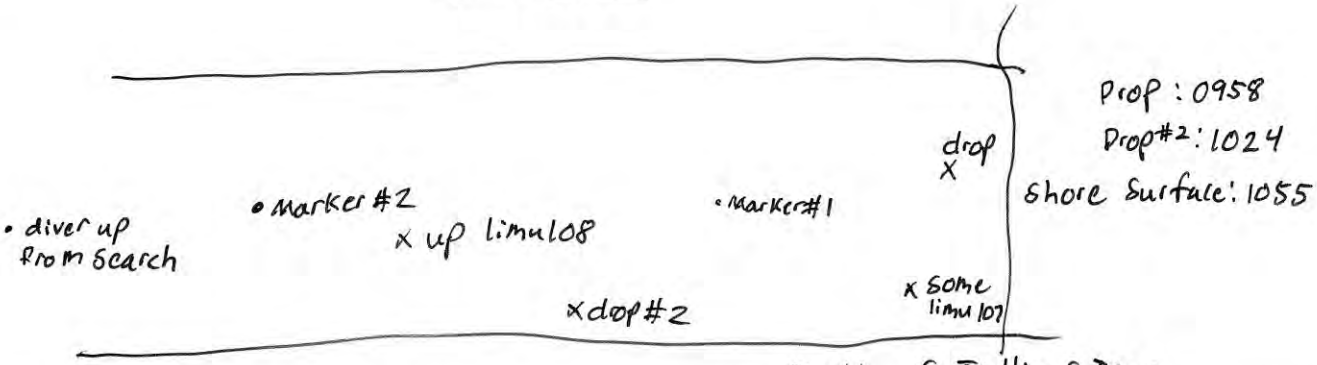
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Makua

Marker Coordinate Lat/Long: N/A

Date: 1-14-14

Segment #: 13



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jelling & Team

On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S13-limu107	1-14-14 1015	21.523056 / -158.230962	30ft	very small, GPS pt. taken
MB-S13-limu108	1-14-14 1055	21.523086 / -158.233637	80 ft	very small, GPS pt. taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

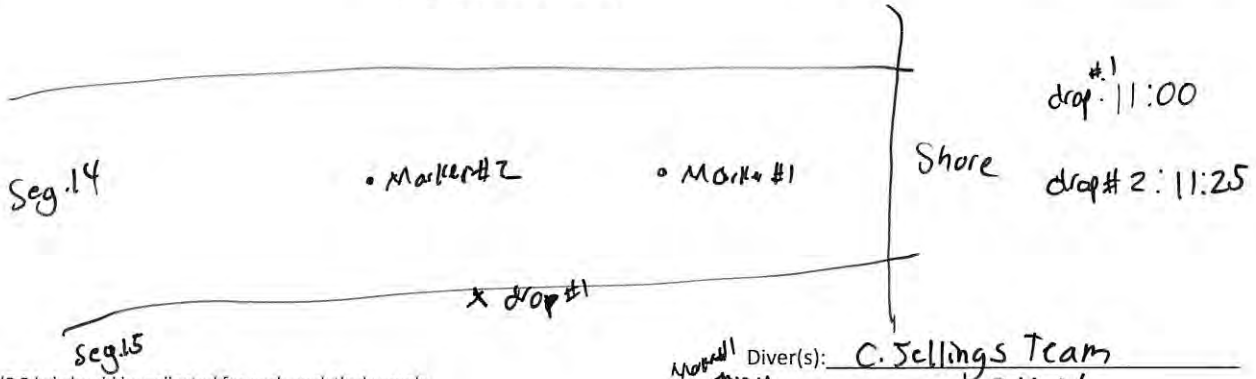
2014 Sample Collection Sheet
~~2013~~ Marine Resources Study

Date: 1-14-14

Study Area: Makua

Segment #: 14-15

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S15-limu109	1-14-14 1140	21.519748 / -158.230148	20ft	~290g w/ sand, GPS pt taken
MB-S15-limu110	1-14-14 1145	21.519748 / -158.230148	20ft	~170g w/ sand, GPS pt taken
MB-S15-limu111	1-14-14 1205	21.519746 / -158.230152	20ft	~150g w/ sand, GPS pt. taken
MB-S15-limu112	1-14-14 1205	21.519746 / -158.230152	20ft	~1,400g w/ sand, GPS pt. taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~N/A~~				
MB-S15-loli114	1-14-14 1130	21.519611 / -158.230380	20ft	~550g, GPS pt taken

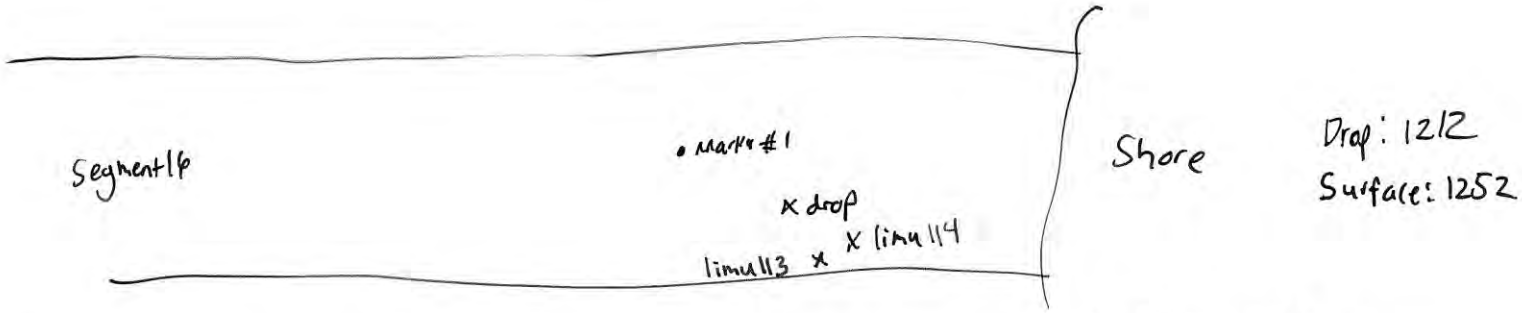
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: 1-14-14

Study Area: Makua

Segment #: 16

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S16-limu113	1-14-14 1250	21.517282 / -158.230705	20ft	~>1,000g w/ sand ; GPS pt. taken
MB-S16-limu114	1-14-14 1252	21.517426 / -158.230544	20ft	~350g w/ sand ; GPS pt. taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

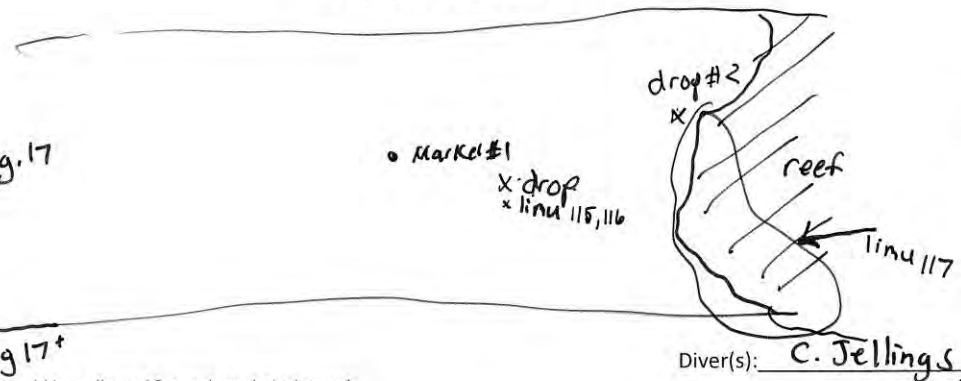
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Date: 1-14-14

Study Area: Makua

Segment #: 17 - 17+

Marker Coordinate
Lat/Long: N/A



Drop 1254
Surface ~~1518~~ 1318
Drop #2 1322

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MB-S17-limu115	1-14-14 1318	21.516151 / -158.231267	25ft	~190 g w/ sand ; GPS pt. taken
MB-S17-limu116	1-14-14 ~~1318~~ 1318	21.516151 / -158.231267	25ft	~130 g w/ sand ; GPS pt. taken
~~MB-S17S17+ limu117~~				
MB-S17S17+-limu117	1-14-14 1400	21.516323 / -158.230360	0-0.5ft	~960g ; GPS pt taken from drop #2 ; collected from reef

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

2014 Sample Collection Sheet
~~2013~~ Marine Resources Study

Date: 1-31-14

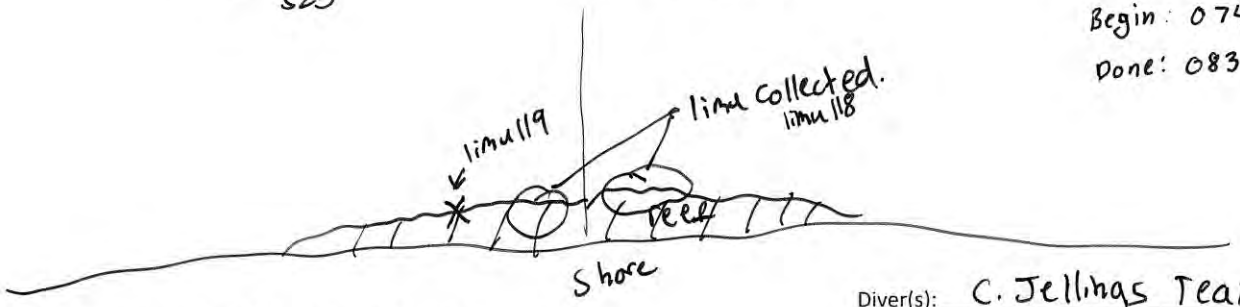
Study Area: Kaena Point

Segment #: ~~24~~ 25 23/24
~~S26~~ S24

~~S24~~ S23

Marker Coordinate
Lat/Long: N/A

Begin: 0742
Done: 0835



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Korde, T. Chock

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Na				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~KP-S24S25-limu118~~	1-31-14 0820	21.580044/-158.237240 21.579878/-158.237566	0ft	~850g gps pt. taken from shore
KP-S23-limu119	1-31-14 0835	21.579847/-158.237868	0ft	(manini) Appeared that fish were eating limu, not very leafy, only stems left 490g

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/a				

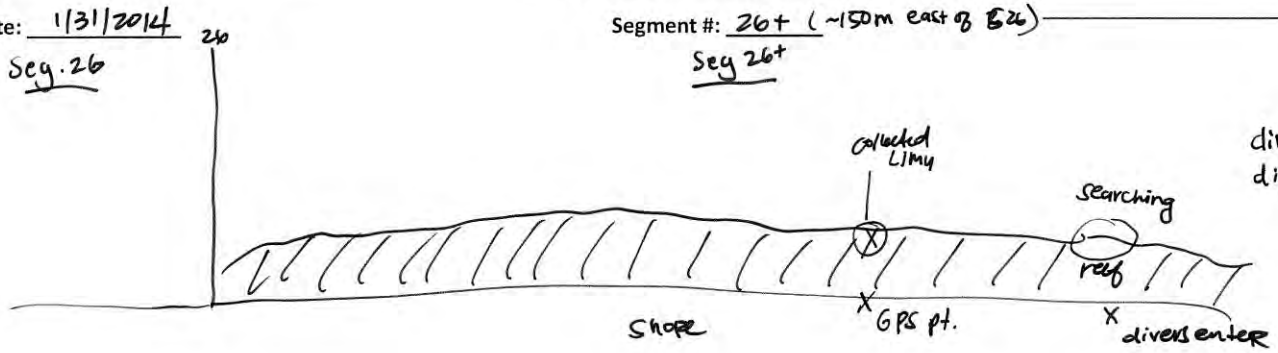
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Study Area: Kaena Point

Marker Coordinate
Lat/Long: N/A

Date: 1/31/2014
Seg. 26

Segment #: 26+ (~150m east of S26)
Seg 26+



divers begin 0845
divers exit 0910

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings team
On-board Scientist(s): S. Roide, T. Chock

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Mg				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S26+-limu120	1/31/2014 0910	21.579131 / -158.230191	0-0.5ft	850g, GPS pt. taken from shore
KP-S26+-limu121	1/31/2014 0910	21.579131 / -158.230191	0-0.5ft	71000g, GPS pt. taken from shore
				nice, leaves intact, not eaten by fish

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Mg				

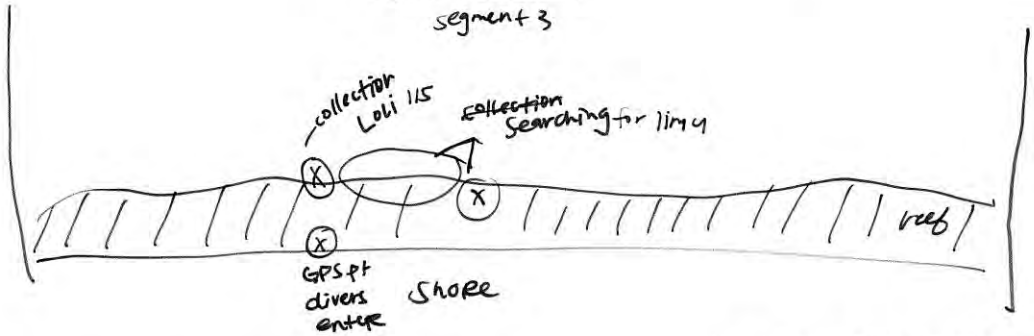
Sample Collection Sheet
2014 ~~2013~~ Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 1-31-2014

Segment #: 3
segment 3



divers enter 0935
divers exit 1000

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings team
On-board Scientist(s): S. Kolde, T. Chock

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~n/a~~ no octo found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
				reef looks clean, shallow
~~n/a~~ no limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S3-Loli 115	1/31/2014 1000	21.582735/-158.200416	1ft	reef looks clean, shallow
				2 loli
				GPS pt. taken from shore

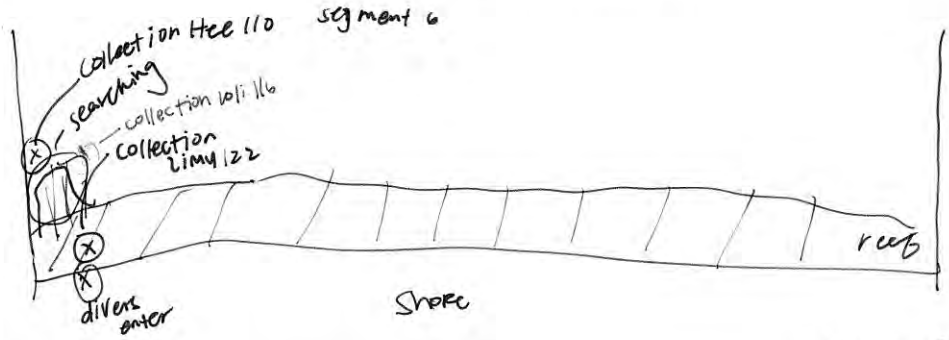
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 1/31/2014

Segment #: 6



divers enter 1025
divers exit 1055

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellingsteam
On-board Scientist(s): S. Koide, T. Crack

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S6 - hee 110	1-31-2014 1045	21.581749/-158.195937	1ft	1190g, GPS pt. taken from shore

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK - S6 - limu 122	1-31-2014 1040	21.581534/-158.195688	0ft	600g, GPS pt. taken from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S6 - loli 116	1-31-2014 1055	21.581534/-158.195688	1ft	3 loli, GPS pt. taken from shore

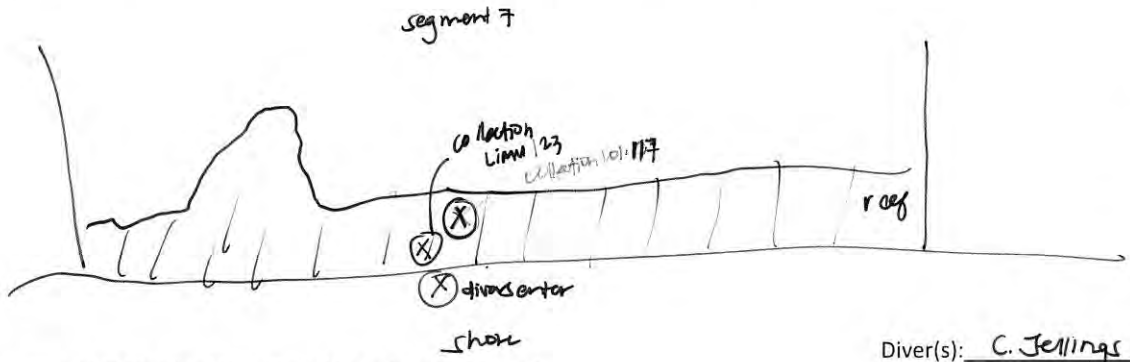
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Makaleia

Marker Coordinate Lat/Long: N/A

Date: 1/31/2014

Segment #: 7



divers enter 1100

divers exit 1145

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings team

On-board Scientist(s): S. Stoide, T. Chock

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~n/a~~ no octo found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-57-limu123	1-31-14 1130	21.581968 / -158.193277	0.5ft	GPS pt. taken from shore, ~600g

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-57-loli117	1/31/2014 1120	21.581968 / -158.193277	2-3ft	640g GPS pt. taken from shore

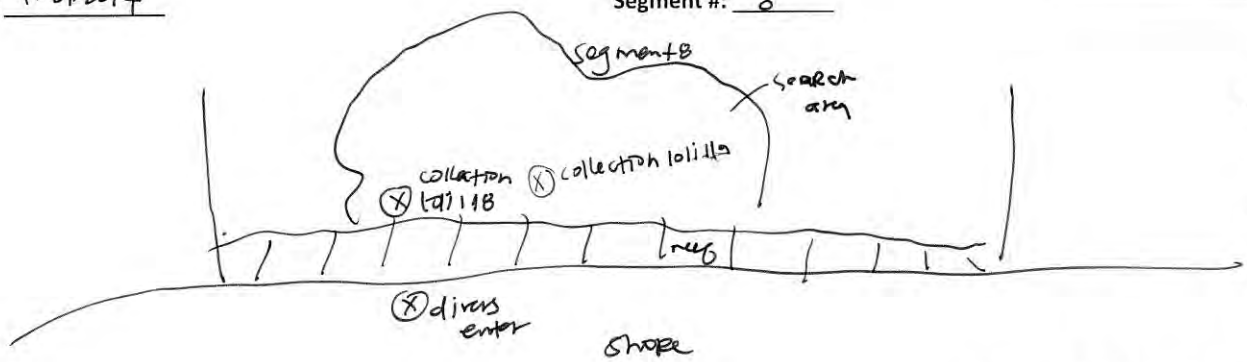
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 1-31-2014

Segment #: 8



Divers enter 1050

Divers exit 1230

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings team

On-board Scientist(s): S. Foide, T. Chock

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
no hee found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
no limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S8-loli118	1/31/2014 1155	21.582651/-158.191448	25ft	750g GPS pt. taken from shore
MK-S8-loli119	1/31/2014 1220	21.582651/-158.191448	7-8ft	2 loli GPS pt. taken from shore

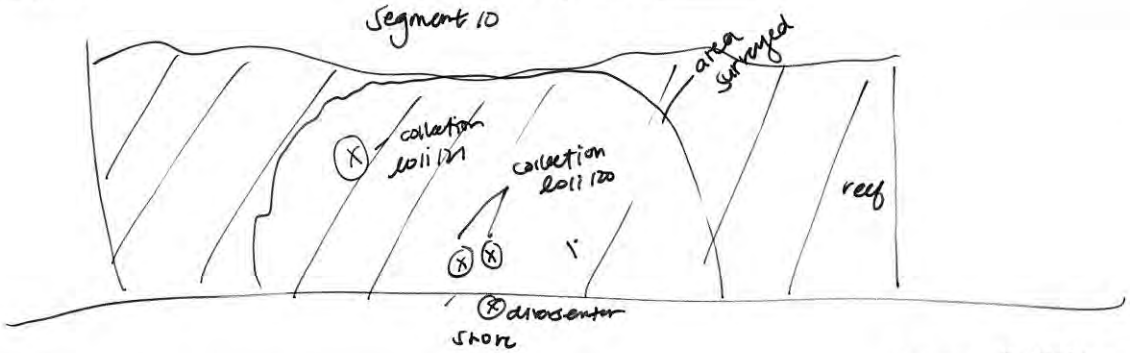
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 1/31/2014

Segment #: 10



Divers enter 1240

Divers exit 1305

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings team

On-board Scientist(s): S. Koide T. Chock

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
no octo found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
no limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S10-loli120	1/31/2014 1245	21.582468 / -158.187348	~~3ft~~	1020g 2 loli (small) GPS pt.
MK-S10-loli121	1/31/2014 1300	21.582468 / -158.187348	~~4-5ft~~	710g 2 loli (large) taken from shore

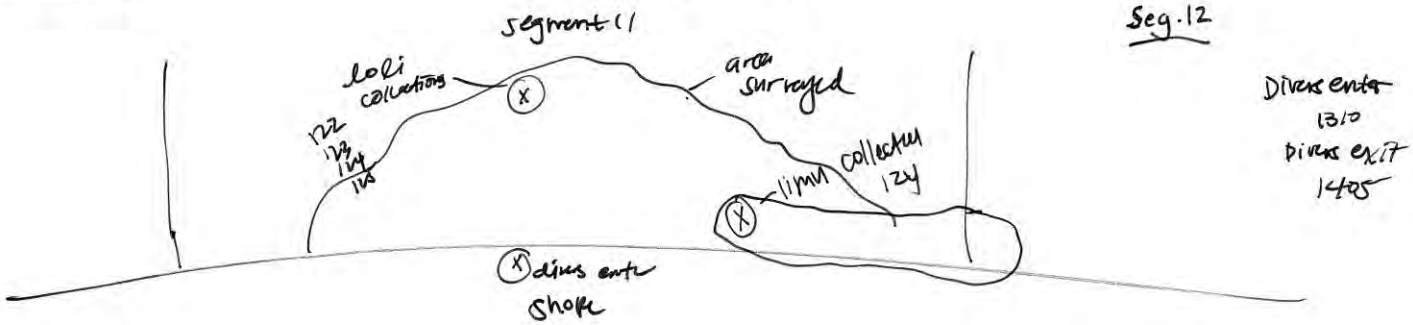
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 1/31/2014

Segment #: 11 /12



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings team

On-board Scientist(s): S. Kaiser, T. Chaot

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
no oct found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-SH-limu 124	1/31/2014 1405	21.581748/-158.184042	0ft	1330 with sand, GPS pt. taken from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S11-loli 122	1/31/2014 1330	21.581728/-158.184381	7ft	1070g large loli
MK-S11-loli 123	1/31/2014 1330	21.581728/-158.184381	7ft	900g large loli
MK-S11-loli 124	1/31/2014 1330	21.581728/-158.184381	7ft	3 loli >1,000g large
MK-S11-loli 125	1/31/2014 1330	21.581728/-158.184381	7ft	3 loli >1,000g large

GPS pt. taken from shore

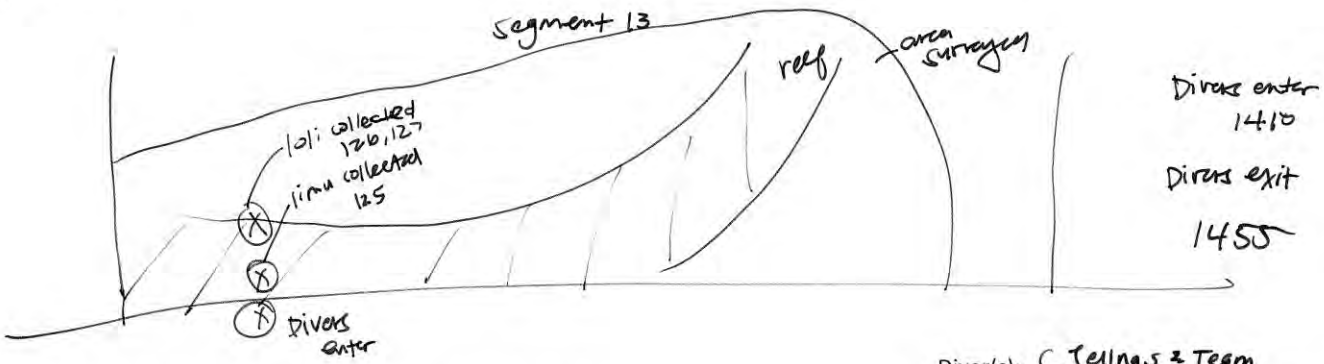
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Makaleia

Marker Coordinate Lat/Long: N/A

Date: 1/31/2014

Segment #: 13



Divers enter 1410

Divers exit 1455

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C Jellings & Team

On-board Scientist(s): S. Koide, T. Chock

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hec found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S13-limu125	1/31/2014 ~~1505~~ 1455	21.581330 / -158.182093	0ft	GPS pt. taken from shore, >1,000g

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S13-loli126	1/31/2014 1435	21.581330 / -158.182093	2ft	1 large loli 980g > GPS pt. taken from shore
MK-S13-loli127	1/31/2014 1435	21.581330 / -158.182093	2ft	2 large loli 1000g

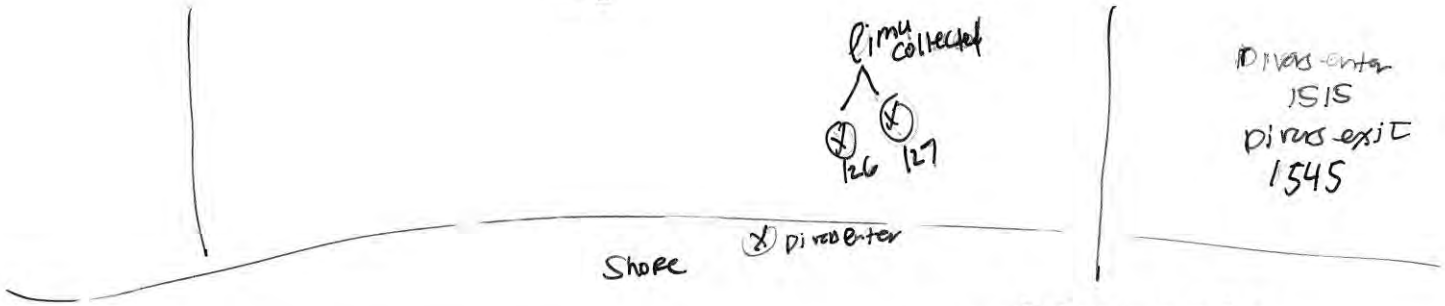
Sample Collection Sheet
2014 Marine Resources Study

Date: 1/31/~~2015~~ 2014

Study Area: Makua

Segment #: 16
segment 16

Marker Coordinate
Lat/Long: N/A



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jennings + team
On-board Scientist(s): S. Faisal, T. Chock

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
no hee found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S16 - limu 126	1/31/2014 1540	21.581151 / -158.175175	1ft	7/000g ; GPS pt. taken from shore
MK-S16 - limu 127	1/31/2014 1540	21.581151 / -158.175175	1ft	7/000g ; GPS pt. taken from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~MK-S16 10111128~~	~~1/31/2014 1540~~			
no loli found				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Segment #: 18

seg 18

Marker Coordinate Lat/Long: N/A

Divers enter: 15:53
Divers exit: 16:15

Collect limu
x loli

x gps point
shore

Date: 1/31/2014

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide, T. Chock

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S18-limu 128	1-31-14 1615	21.580964 / -158.172287	2ft	>1,000g ; GPS pt. taken from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S18-loli 128	1-31-14 1605	21.580964 / -158.172287	8ft	1 large, 1 small loli

Sample Collection Sheet
2014 Marine Resources Study

Date: ~~2-11-14~~ 1-31-14

Study Area: Mokuleia

Segment #: 19

Seg 19

Marker Coordinate
Lat/Long: N/A

Enter: 1628
Exit: 1645

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide, T. Chock

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
M K-S19-loli 129	1-31-14 1645	21.579786 / -158.170196	6ft	2 Small ~590g, GPS pt. taken from shore

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

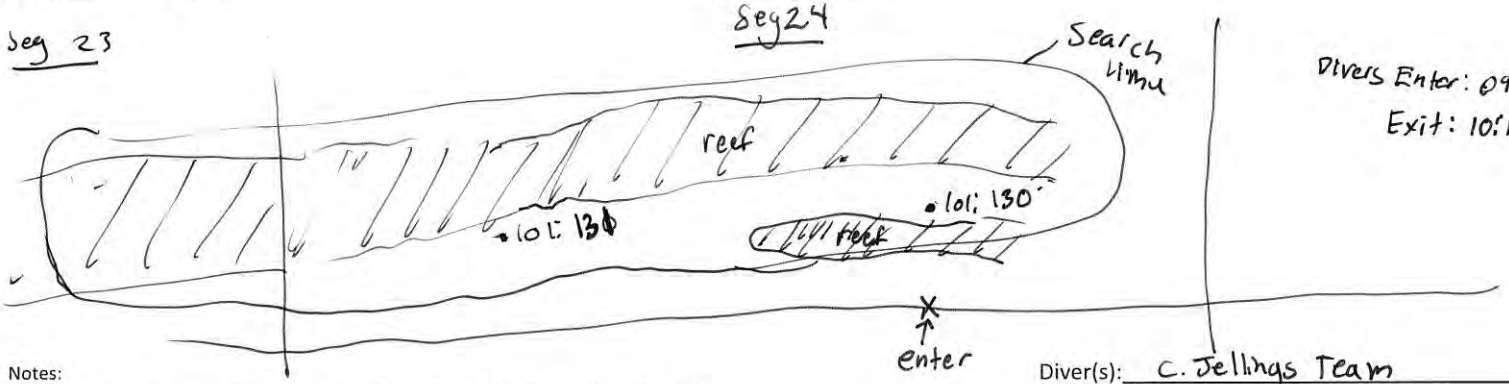
Marker Coordinate
Lat/Long: N/A

Date: 2-11-14

Segment #: 24

Seg 23

Seg24



Divers Enter: 0930
Exit: 10:12

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found				Diver said lots of short brown limu. No limu kohu

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S24-loli130	2-11-14 10:10	21.579959/-158.160466	5 ft	2 Small loli ; GPS pt. taken from Shore
MK-S24-loli131	2-11-14 10:12	21.579959/-158.160466	4ft	5 Small loli ; GPS pt. taken from Shore

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

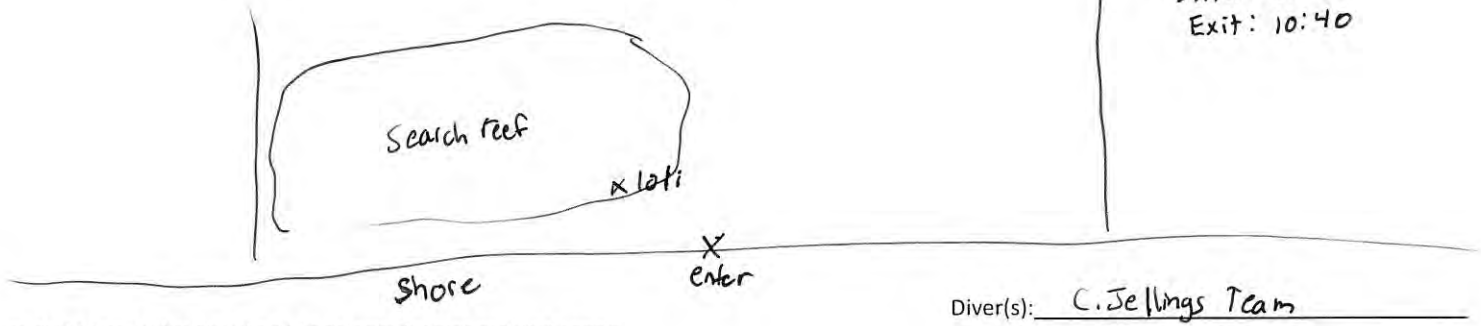
Marker Coordinate Lat/Long: N/A

Date: 2-11-14

Segment #: 23

Seg 23

Enter: 10:23
Exit: 10:40



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S23-loli 132	2-11-14 1030	21.580654 / -158.162351	5 ft	large ~920g
MK-S23-loli 133	2-11-14 1030	21.580654 / -158.162351	5 ft	large ~980g
MK-S23-loli 134	2-11-14 1040	21.580654 / -158.162351	4 ft	2 large >1,000g
MK-S23-loli 135	2-11-14 1040	21.580654 / -158.162351	4 ft	2 large >1,000g

GPS pt. taken from shore

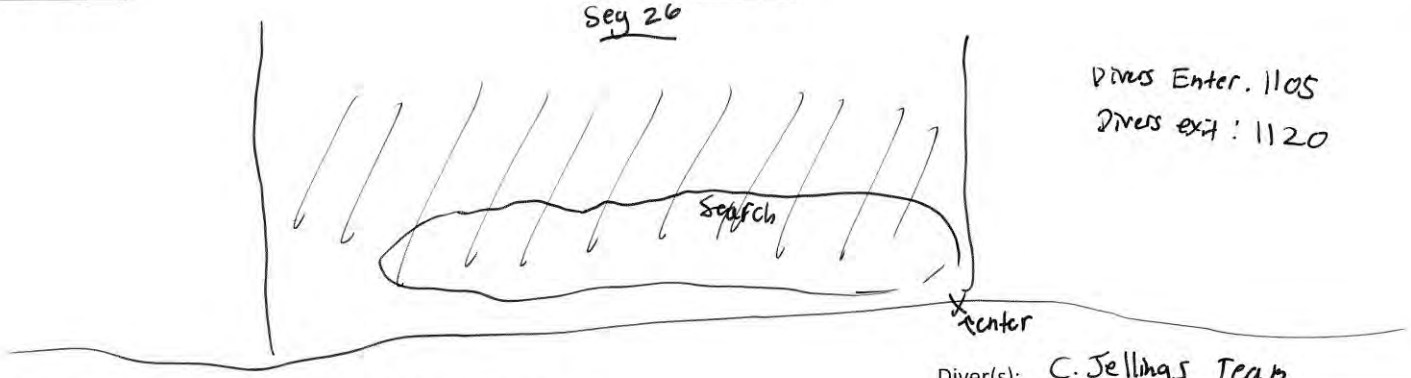
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 2-11-14

Segment #: 26
Seg 26



Dives Enter. 1105
Dives exit: 1120

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
NO limu found				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

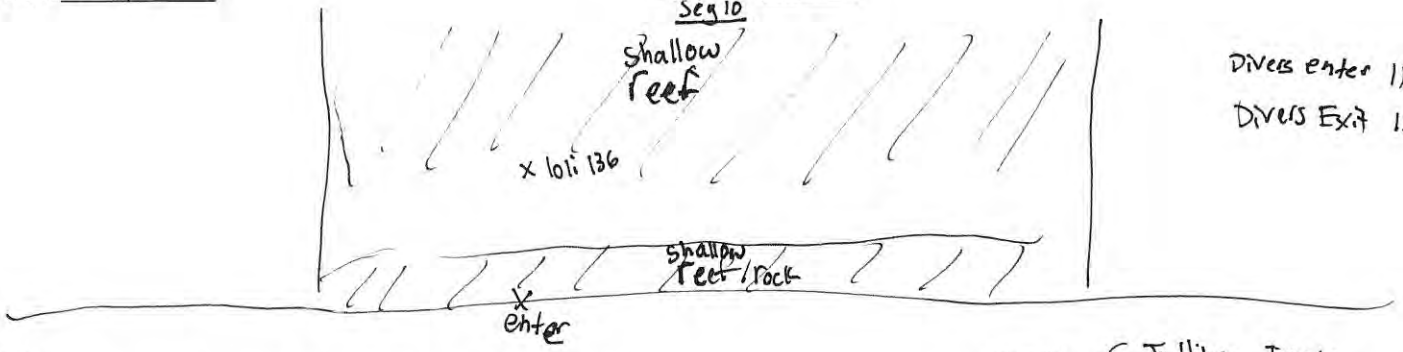
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 2-11-14

Segment #: 10



Divers enter 1156
Divers Exit 1240

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No limu found				Per diver about 30 patches but very short only ~ 1/2-1/4" long looks like sand shift may have killed limu

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~MK-52~~				
MK-S10-loli 136	2-11-14 12:12	21.582506 / -158.187795	4ft	large, ~640g, GPS pt. taken from shore

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

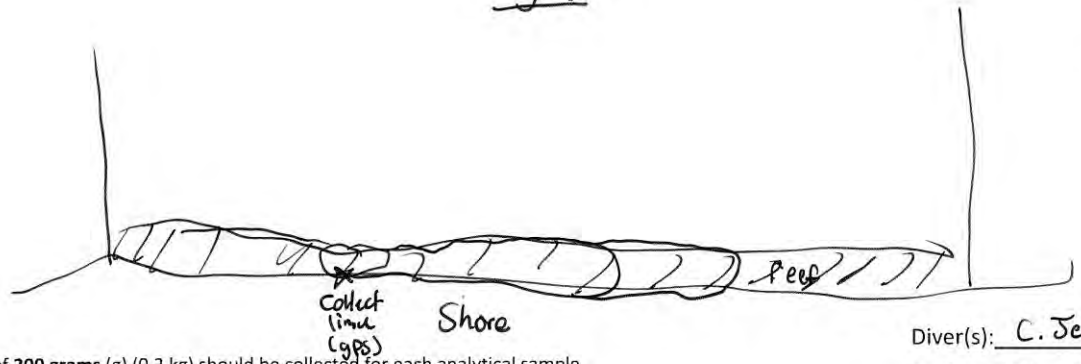
Marker Coordinate
Lat/Long: N/A

Date: 2-11-14

Segment #: 4

Seg 4

Enter: 1300
Exit: 1340



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Kade

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hee found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S4-limu 129	2-11-14 1340	21.582594 / -158.199230	0.5-1ft	~900g, GPS pt. taken from shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

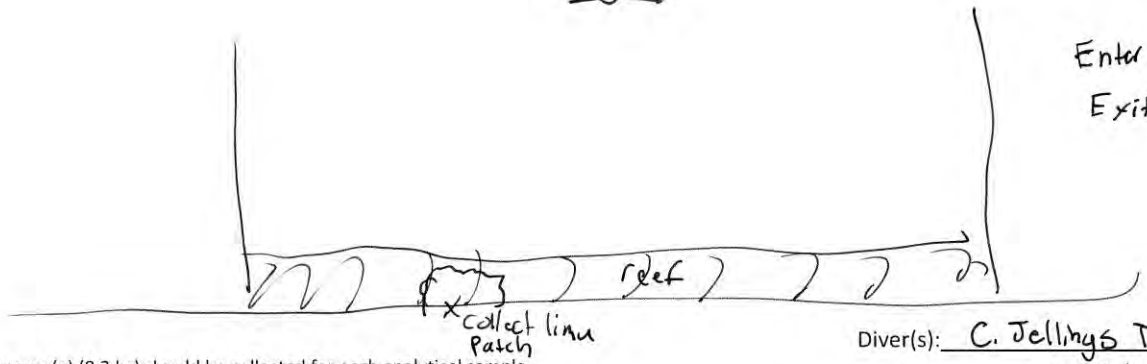
Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 2-11-14

Segment #: 2
Seg 2

Enter 1350
Exit 1425



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
No hec found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S2-limu130	2-11-14 1415	21.581698 / -158.203070	0.5-1ft	~1,320g ; GPS pt. taken from Shore
MK-S2-limu131	2-11-14 1425	21.581698 / -158.203070	0.5-1ft	~640g ; GPS pt. taken from Shore

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Kaena Point

Segment #: 26 4/26

Date: 3-27-14

Seg 26

• Marker #1

X limu 132, 133

~~Some~~ limu search X drop

X ~~Some~~ limu search

Drop 0726

Surface 0820

Shore

Marker Coordinate
Lat/Long: N/A

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-526 ~~526+~~ -limu132	3-27-14 0820	21.585614 / -158.232555	~~45~~ 45 ft	> 1,000g w/sand > GPS pt. taken
Kp-526-limu 133	3-27-14 0820	21.585614 / -158.232555	45 ft	~1,070g w/ sand

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				

Sample Collection Sheet
2014 Marine Resources Study

Date: 3-27-14

Study Area: Moluleia

Segment #: 24
• Marker #2

Marker Coordinate
Lat/Long: N/A

drop
x

x hee III

Drop : 0830
Surface 0850

• marker #1

shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Korde

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-524-hee III	3-27-14 0850	21.588571 / -158.159793	55ft	small, ~510g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 3-27-14
S 22

Segment #: 23 / 22
on Seg 23

x drop

drop: 858
Surface: 0920

x hee112

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

• marker #1

shore

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S22-hee112	3-27-14 0920	21.588514 / -158.163886	35 ft	~990g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 3-27-14

Segment #: 20

seg 18 | seg 19 | seg 20 . marker #2

up #4 x | x drop#3 (CO) | up#3 x drop#4 | x up#1 | x drop# 2 | x drop#1

drop#1 0928
~~Surface~~
drop#2 0948
drop#3 1010
drop#4 1041
Surface 1100

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample. Shore

Diver(s): C. Sellings Team
On-board Scientist(s): S. Kaide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

Date: 3-27-14

Study Area: Makaulera

Segment #: 16, 17

Marker Coordinate
Lat/Long: N/A

Seg 16
• Marker #2

Seg 17
• Marker #2

drop 11:05
Surface 1123

x drop

x heelis

• Marker #1
↓
Shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-516-heelis	3-27-14 1123	21.591253 / -158.175386	60ft	~620g ; GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 3-27-14

Segment #: ~~15~~ 14, 13
Seg ~~15~~ 14
• Marker #2

Seg 13
• Marker #2

X
heel14

Seg 15
• Marker #2

drop 1130
surface 12:05

X drop

Shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S13-heel14	3-27-14 1205	21.590825 / -158.180731	100ft	~590g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 3-27-14

Segment #: 12 - 9

Seg 9 Seg 10 Seg 11 Seg 12 • Marker #2

x drop#2
x hee 115

x drop#1

drop#1 1210
drop #2 1244
surface! 1305

x hee 116, 117

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Shore

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
~~MK-S10-hee115~~ ↑	3-27-14 1240	21.591841 / -158.187953	55ft	very small ~200g, GPS pt. taken
MK-S10-hee115	~~3-27-14~~			
MK-S9-hee116	3-27-14 1305	21.590745 / -158.189227	50ft	small ~480g > GPS pt. taken
MK-S9-hee117	3-27-14 1305	21.590745 / -158.189227	50ft	small ~360g

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 3-27-14

Segment #: 8 - 4

drop #1 1310
drop #2 1407
Surface 1430

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate
Lat/Long: N/A

Date: 3-27-14

Seg 3 **Segment #:** 4/3 Seg 4
• Marker #2 • marker #2

x hee x drop

drop: 1435
surface: 1508

Shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S3-hee 118	3-27-14 1508	21.589976 / -158.201062	60ft	~1,060g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

Date: 3-27-14

Study Area: Mokuleia

Segment #: 2

seg2

x drop

x surface #1

Seg 3

x surface #2

drop 1510

Surface #1 1530

Surface #2 1543

Shore

Marker Coordinate
Lat/Long: N/A

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None Found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

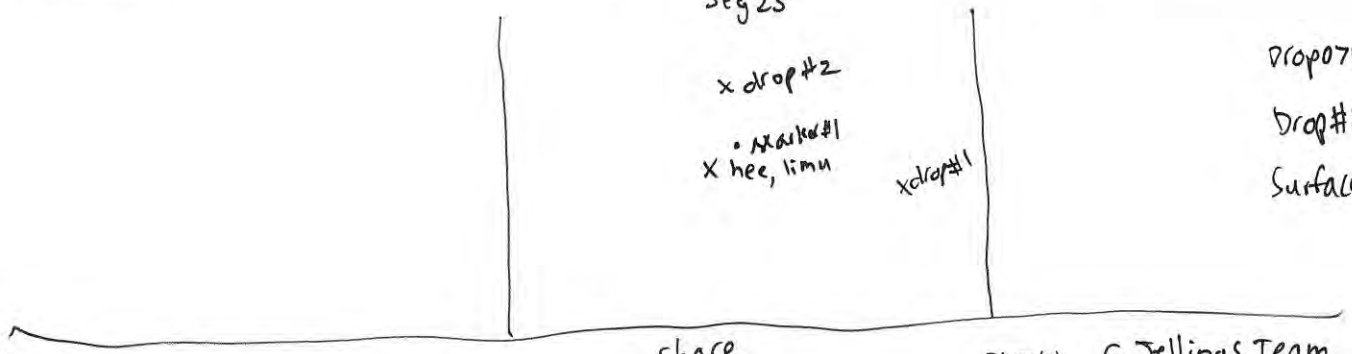
Sample Collection Sheet
2014 Marine Resources Study

Date: 3-28-14

Study Area: Kaena Point

Segment #: 25
Seg25

Marker Coordinate
Lat/Long: N/A



Drop0745
Drop#2 0805
Surface0838

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S25-hee119	3-28-14 0838	21.587317 / -158.234769	60ft	~460g ; GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S25-~~hee~~ limu134	3-28-14 0838	21.587317 / -158.234769	60ft	~1,360g w/sand, GPS pt. taken
Kp-S25-limu135	3-28-14 0838	21.587317 / -158.234769	60ft	~1,230g w/sand, GPS pt. taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				

Sample Collection Sheet
2014 Marine Resources Study

Date: 3-28-14

Study Area: Kaena Point

Segment #: 22

Seg 22

• Marker #1

x drop

x limu, hee

Marker Coordinate
Lat/Long: N/A

Drop: 0848

Surface: 0920

Shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S22-hee120	3-28-14 0920	21.586629 / -158.240805	50ft	~1,080g ; GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S22-limu136	3-28-14 0920	21.586629 / -158.240805	50ft	>1,000g w/sand, GPS pt. taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate
Lat/Long: N/A

Date: 3-28-14
Seg 18

Segment #: 19
Seg 19

• Marker #1

x drop

Drop: 0930
Surface: 1000

x hee, limu

↓ shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S18-hee121	3-28-14 1000	21.585278/-158.247387	50ft	~720g ; GPS pt. taken
KP-S18-hee122	3-28-14 1000	21.585278/-158.247387	50ft	~620g ; GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S18-limu137	3-28-14 1000	21.585278/-158.247387	50ft	~1,080g w/sand ; GPS pt. taken
KP-S18-limu138	3-28-14 1000	21.585278/-158.247387	50ft	~910g w/sand ; GPS pt. taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Kaena point

Marker Coordinate Lat/Long: N/A

Date: 3-28-14
Seg 15

Segment #: 16 / 15
Seg 16

x drop

Drop: 1005
Surface: 1035

X hee, loli, limu

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Shore

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S15-hee 123	3-28-14 1035	21.584123/-158.253296	55 ft	~970g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S15-limu139	3-28-14 10:35	21.584123/-158.253296	55 ft	~520g w/sand, GPS pt. taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S15-loli 137	3-28-14 1035	21.584123/-158.253296	55 ft	~1,410g, GPS pt. taken
Kp-S15-loli 138	3-28-14 1035	21.584123/-158.253296	55 ft	~970g, GPS pt. taken

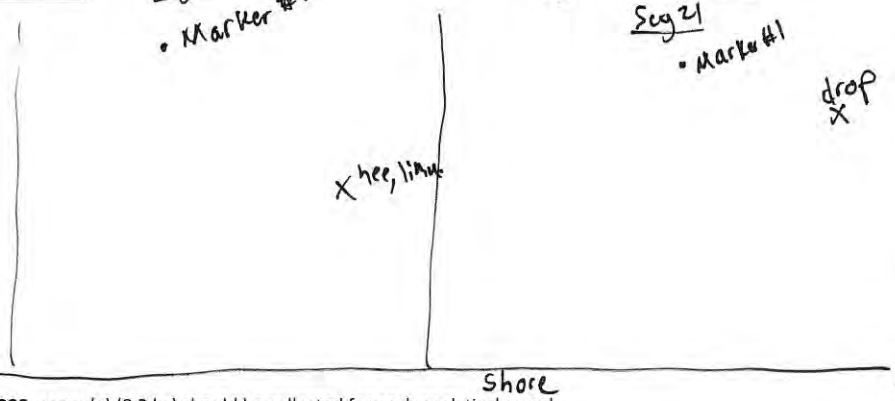
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Kapua Point

Marker Coordinate
Lat/Long: N/A

Date: 3-28-15

Segment #: 21/20



Prop: 1045
Surface: 1132

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S20-hee 124	3-28-14 1132	21.585927 / -158.243915	40ft	~1,030g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S20-limu 140	3-28-14 1132	21.585927 / -158.243915	40ft	~950g w/ sand, GPS pt. taken
KP-S20-limu 141	3-28-14 1132	21.585927 / -158.243915	40ft	~480g w/ sand, GPS pt. taken

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				

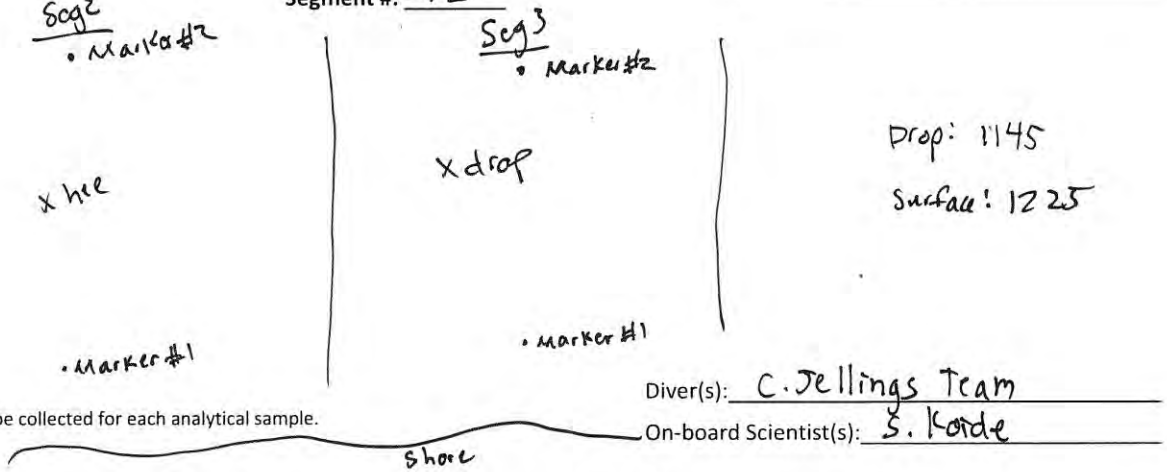
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Mokuleia

Marker Coordinate Lat/Long: N/A

Date: 3-28-14

Segment #: 3/2



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Korde

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
MK-S2-heel9b	3-28-14 1225	21.590233/-158.203111	40ft	~370g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate
Lat/Long: N/A

Date: 3-28-14

Segment #: 26 tt
Seg 26t

Seg 26
• Marker #2

Drop: 1241

Surface: 1301

x drop

x hee, loli

Marker #1

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Shore

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S26t-hee125	3-28-14 1301	21.589071 / -158.231271	60ft	~400g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S26t-loli139	3-28-14 1301	21.589071 / -158.231271	60ft	~950g, GPS pt. taken

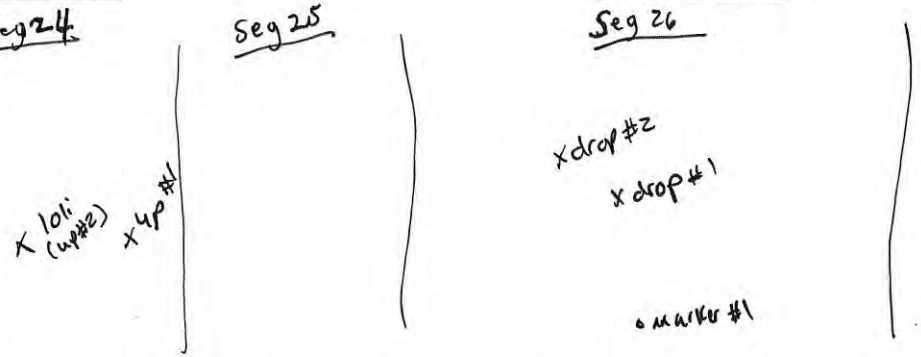
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Kaena point

Marker Coordinate
Lat/Long: N/A

Date: 3-28-14

Segment #: 26 / 24



drop #1: 1303
~~Surface:~~
Drop #2 1339
Surface #2 1406

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
None found				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-524-loli 140	3-28-14 1406	21.587989 / -158.235799	65ft	~1,250g, GPS pt. taken

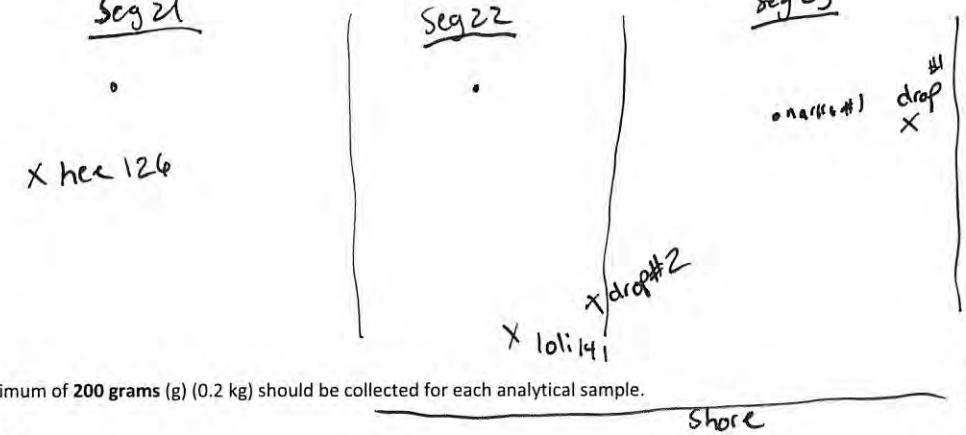
Sample Collection Sheet
2014 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate Lat/Long: N/A

Date: 3-28-14

Segment #: 23-21



Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S21-hee126	3-28-14 1458	21.586836 / -158.242649	70ft	~1,220g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S22-loli141	3-28-14 1520	21.582223 / -158.239441	25ft	~740g, GPS pt. taken

Sample Collection Sheet
2014 Marine Resources Study

Date: 3-28-14

Study Area: Kaena Point

Segment #: 21

Seg 21

Marker Coordinate
Lat/Long: N/A

drop 1525
Surface 1530

x loli 142
x drop

Shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S21-loli142	3-28-14 1530	21.582037 / -158.241668	20ft	~910g ; GPS pt. taken

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate Lat/Long: N/A

Date: 3-28-14

Segment #: 20

Seg. 20

Marker #1

drop 1535
surface 1547

x drop
x loli

shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-520-loli 143	3-28-14 1547	21.582149 / -158.243480	20ft	~660g ; GPS pt. taken

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Kaena Point

Segment #: 17

Marker Coordinate
Lat/Long: N/A

Date: 3-28-14

Seg 16

Seg 17

drop #2
X loli
Surface #2

X Surface #1
X drop #1

drop #1 1551
Surface 1600
~~1400~~
drop #2 1602
Surface 1610

Shore

Diver(s): C. Jellings Team
On-board Scientist(s): S. Koide

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
Kp-S17-loli 144	3-28-14 1610	21.580788 / -158.250310	25 ft	~440g GPS Point taken
Kp-S17-loli 145	3-28-14 1610	21.580788 / -158.250310	25 ft	~470g 3 Small loli, GPS pt. taken

Sample Collection Sheet
2014 Marine Resources Study

Study Area: Kaena Point

Marker Coordinate
Lat/Long: N/A

Date: 3-28-14

Segment #: 14-13

Seg 13

• Marker #1

x drop #2

Seg 14

x hee loli 147 (surface drop #2)

Drop #1 1616

Drop # 2 1635

x loli 146 (surface drop #1)

x drop #1

Shore

Notes:
- A minimum of **200 grams** (g) (0.2 kg) should be collected for each analytical sample.

Diver(s): C. Jellings Team

On-board Scientist(s): S. Koide

Octopus

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S14-hee127	3-28-14 1643	21.583460 / -158.255437	60ft	~370g, GPS pt. taken

Limu

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
N/A				

Loli

Field ID#	Date and Time	Latitude/Longitude	Depth	Comments
KP-S14-loli146	3-28-14 1628	21.580097 / -158.256532	20ft	~400g GPS pt. taken
KP-S14-loli147	3-28-14 1643	21.583460 / -158.255437	60ft	~990g GPS pt. taken

Appendix B: Limu Identification

May 8, 2014

FINAL REPORT:

IDENTIFICATION OF *LIMU KOHU* (*ASPARAGOPSIS TAXIFORMIS*)

Prepared By:

Dr. Heather L. Spalding

Aquatic Research Consultants LLC, PO Box 61471, Honolulu, HI 96839

Prepared For:

Dr. Eric De Carlo

Department of Oceanography, SOEST, 1000 Pope Rd, MSB 509, Honolulu, HI 96822

Cover photo. Asparagopsis taxiformis *from frozen sample MAK129L. Plant is 8 cm in height.*

Summary

Asparagopsis taxiformis (*Limu kohu*) is a red alga found in the intertidal to shallow subtidal waters in Hawai'i, and is commonly consumed by Hawaiians. As part of a larger study on the concentration of constituents of potential concern in *Limu kohu*, I was contracted to verify the identification of *Asparagopsis taxiformis* using traditional taxonomic methodologies. Fresh and frozen algal samples were sorted, preserved in triplicate (as herbarium presses, in silica gel for molecular analyses, and in formalin), and examined under a microscope. The specimens were verified as *Asparagopsis taxiformis* (Delile) Trevisan de Saint-Léon based on morphological analyses. Voucher specimens were deposited at the *Herbarium Pacificum* (BISH), Bernice Pauahi Bishop Museum. Remaining samples (three herbarium presses, two vials of formalin preserved samples, two vials of preserved epiphyte samples, and three silica gel preserved samples) were deposited with E. De Carlo.

Introduction

Limu kohu (*Asparagopsis taxiformis*) is likely the most highly valued alga used as food by those of Hawaiian ethnicity (Abbott 1992). Plants are characterized by having creeping stolons with cylindrical erect axes that are radially branched to several orders, giving a "fluffy" appearance (Abbott 1999). If the creeping stolons are left undisturbed after harvesting, then the erect fronds are capable of repeatedly regenerating (Huisman et al. 2007). This visually apparent phase of *Asparagopsis* is called the gametophyte stage. *Asparagopsis* also has an alternate tetrasporangial life stage, known as the "*Falkenbergia*" phase, which occurs as a small, filamentous, tufted plant with only three pericentral cells (Abbott 1999). *Asparagopsis* is commonly encountered in intertidal to shallow subtidal environments in Hawai'i, with the "*Falkenbergia*" phase described to at least 60 m depths (Abbott 1999).

Morphologically, *Asparagopsis* may be confused in the field with other red algal genera, such as *Daysa* or *Spirocladia*. While discerning gross features, such as a lack of calcification or a gelatinous matrix, are easily recognized, microscopic examination of specimens is needed to determine diagnostic features indicative of *Asparagopsis*, such as a filamentous structure, the number of cells surrounding the axial cells, or the presence/absence of cortication. This report was solicited to verify the identification of specimens collected as "*Limu kohu*" based on morphological and microscopic features.

Methods

Fresh and frozen collections were received in individual plastic bags. Each sample was sorted by species, with epiphytes removed and preserved in a 4% buffered formaldehyde solution in seawater (unidentified). Collected macroalgae were saved in triplicate as herbarium presses for voucher specimens, in silica gel for molecular analyses, and in a 4% buffered formaldehyde solution in seawater. Slides of cross-sections were made for microscopic analyses according to Tsuda and Abbott (1985), and examined under a microscope. Algae were identified using the systematic keys and taxonomic information provided in Abbott (1999) and Huisman et al. (2007). Voucher specimens were deposited at the *Herbarium Pacificum* (BISH), Bernice Pauahi Bishop Museum, Honolulu, Hawai'i (Appendix A).

Molecular analyses were not conducted, but silica samples were prepared from the same material for future analyses, if desired.

Results

Specimens identified as "*Limu kohu*" were verified as *Asparagopsis taxiformis* (Delile) Trevisan de Saint-Léon based on morphological and microscopic examination. The upright primary axes were cylindrical, with heights ranging from 4 to 10 cm. Upright portions occurred along creeping stolons, and ranged in coloration from dark maroon to brown (Figure 1). Plants were uncalcified with tufts of pigmented filaments, showed no banding pattern or restriction of cortication to nodes, monosiphonous tips, and contained axial cells surrounded by three irregularly arranged cells.

Figure 1. Herbarium specimen of *Asparagopsis taxiformis*. Scale bar is 2 cm.

Literature Cited

Abbott, I. A. 1992. *Lā'au Hawai'i: traditional Hawaiian uses of plants*. Bernice Pauahi Bishop Museum Press, 163 pp.

Abbott, I. A. 1999. *Marine red algae of the Hawaiian Islands.* Bishop Museum Press, 477 pp.

Huisman, J. M., Abbott, I. A. & Smith, C. M. 2007. *Hawaiian reef plants.* University of Hawaii Sea Grant College Program, Honolulu, Hawaii, 264 pp.

Tsuda, R. & Abbott, I. 1985. Collection, handling, preservation, and logistics. *In*: Littler, M. & Littler, D. [Eds.] *Handbook of phycological methods: ecological field methods.* Cambridge University Press, London, pp. 8-86.

Appendix A

Accession information for two herbarium presses submitted to the Bernice Pauahi Bishop Museum. Both presses were replicates from the same collection; thus, they were submitted under one accession number.

Taxon Name *Asparagopsis taxiformis* (Delile) Trevisan de Saint-Léon

Collection ID: MAK 131L

Locality: Kaena Point, Oahu, Hawai'i

GPS: 21.585614; -158.232555

45 ft. depth, hand collected by divers

Collection date: 3/27/2014

Leg. Carl Jellings Team

Det. Heather Spalding

Accession Number: BISH 759431

Appendix C: Sample Collection List

Table C-1: Sample collection list, Mākua Marine Resources Supplemental Study.

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
Mākua								
Seaweed (limu kohu)								
Dry Season								
MB-S17-Limu001, MB-S17-Limu002, MB-S17-Limu029	MAK001L/2L/26L	17	9/9/2013; 9/10/2013; 9/27/2013	12:50 (1L); 10:46 (2L); 13:35 (3L)	*21.51565* (21° 30.939) (IL); 21.516279, 21.515679, 21.515415 (2L); 21.516411 (26L)	*-158.2303* (-158° 13.818) (1L); -158.229696, -158.229672, -158.229416 (2 L); -158.230227 (26L)	0 ft (1L); 0 ft (2L); 0-1 ft (26L)	Yes
MB-S17+-Limu016	MAK013L	17+	9/18/2013	07:50	21.515141	-158.229884	0 ft	Yes
MB-S3-Limu023; MB-S3S4-Limu024; MB-S3S4-Limu030	MAK016L/21L/27L	3; 3/4; 3/4	9/23/2013; 9/27/2013; 9/27/2013	13:00 (16L); 09:55 (21L); 15:00 (27L)	21.542256 (16L); 21.540478 (21L); 21.541989 (27L)	-158.237774 (16L); -158.236783 (21L); -158.23786 (27L)	0-0.5 ft (16L); 0 ft (21L); 0 ft (27L)	Yes
MB-S17++-Limu025	MAK022L	17++	9/27/2013	12:55	21.515042	-158.230359	0-1 ft	Yes
MB-S17++-Limu026	MAK023L	17++	9/27/2013	12:55	21.515042	-158.230359	0-1 ft	Yes
MB-S17++-Limu027; MB-S17++-Limu028	MAK024L/25L	17++	9/27/2013	12:55	21.515042	-158.230359	0-1 ft	Yes
MB-S17++-Limu028	MAK025L	17++	9/27/2013	12:55	21.515042	-158.230359	0-1 ft	Yes
MB-S3-Limu045	MAK029L	3	10/11/2013	15:05	21.541371	-158.237278	0-1 ft	Yes
Wet Season								
MB-S17+-Limu101	MAK101L	17+	1/13/2014	09:10	21.514985	-158.230117	0-0.5 ft	Yes
MB-S15-Limu102	MAK102L	15	1/13/2014	10:02	21.519654	-158.230449	20 ft	Yes
MB-S11-Limu103	MAK103L EXTRA	11	1/13/2014	10:40	21.526901	-158.230246	30 ft	No (Archived at ARDL)
MB-S1+-Limu104	MAK104L EXTRA	1+	1/13/2014	15:00	21.546732	-158.241842	18 ft	No (Archived at ARDL)
MB-S3-Limu105	MAK105L	3	1/13/2014	15:20	21.541335	-158.237356	0 ft	Yes
MB-S3S4-Limu106	MAK106L	3, 4	1/14/2014	08:45	21.541370	-158.237226	0-0.5 ft	Yes
MB-S13-Limu107; MB-S13-Limu108	MAK107L (COMP) EXTRA	13	1/14/2014	10:15 (Li107); 10:55 (Li108)	21.523056 (Li107); 21.523086 (Li108)	-158.230962 (Li107); -158.233637 (Li108)	30 ft (Li107); 80 ft (Li108)	No (Archived at ARDL)
MB-S15-Limu109, MB-S15-Limu110, MB-S15-Limu111, MB-S16-Limu114	MAK108, 109, 110, 113L	15, 15, 15, 16	1/14/2014	11:40 (108L); 11:45 (109L); 12:05 (110L); 12:52 (113L)	21.519748 (108L); 21.519748 (109L); 21.519746 (110L); 21.517426 (113L)	-158.230148 (108L); -158.230148 (109L); -158.230152 (110L); -158.230544 (113L)	20 ft	Yes

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
MB-S15-Limu112	MAK111L	15	1/14/2014	12:05	21.519746	-158.230152	20 ft	Yes
MB-S16-Limu113	MAK112L	16	1/14/2014	12:50	21.517282	-158.230705	20 ft	Yes
MB-S17-Limu115, MB-S17-Limu116	MAK114L (COMP) EXTRA	17	1/14/2014	13:18	21.516151	-158.231267	25 ft	No (Archived at ARDL)
MB-S17S17+-Limu117	MAK115L	17, 17+	1/14/2014	14:00	21.516323	-158.230360	0-0.5 ft	Yes
Octopus (He'e)								
Dry Season								
MB-S6-Hee001	MAK0010	6	9/9/2013	11:04	*21.5363* (21° 32.178)	*-158.234517* (-158° 14.071)	50 ft	Yes
MB-S17-Hee002	MAK0020	17	9/9/2013	13:15	*21.5156167* (21° 30.937)	*-158.2380167* (-158° 14.281)	60 ft	Yes
MB-S16-Hee003	MAK0030	16	9/9/2013	15:05	*21.51785* (21° 31.071)	*-158.23618333* (-158° 14.171)	60 ft	Yes
MB-S8-Hee004	MAK0040	8	9/11/2013	10:11	*21.5323333* (21° 31.940)	*-158.2331333* (-158° 13.988)	*49.2 ft* (15 m)	Yes
B-S7-Hee005	MAK0050	7	9/11/2013	10:35	*21.5338833* (21° 32.033)	*-158.2339833* (-158° 14.039)	*47.9 ft* (14.6 m)	Yes
MB-S5-Hee006	MAK0060	5	9/11/2013	10:55	*21.5383* (21° 32.298)	*-158.2360833* (-158° 14.165)	*34.8 ft* (10.6 m)	Yes
MB-S4-Hee007	MAK0070	4	9/11/2013	11:25	*21.5398* (21° 32.388)	*-158.2389* (-158° 14.334)	*45.6 ft* (13.9 m)	Yes
MB-S12-Hee008	MAK0080	12	9/11/2013	12:10	*21.52435* (21° 31.461)	*-158.234* (-158° 14.040)	*52.5 ft* (16.0 m)	Yes
Wet Season								
MB-S15-Hee101	EXTRA 0-A	15	1/13/2014	09:20	21.519935	-158.231214	20 ft	No (Archived at ARDL)
MB-S15-Hee102	MAK1010	15	1/13/2014	10:02	21.519654	-158.230449	20 ft	Yes
MB-S11-Hee103	MAK1020	11	1/13/2014	10:30	21.527235	-158.231754	25 ft	Yes
MB-S8-Hee104	MAK1030	8	1/13/2014	11:02	21.532230	-158.231182	35-40 ft	Yes
MB-S7-Hee105	MAK1040	7	1/13/2014	11:30	21.534416	-158.232106	30 ft	Yes
MB-S5-Hee106	MAK1050	5	1/13/2014	11:58	21.538025	-158.234728	20 ft	Yes
MB-S4-Hee107	MAK1060	4	1/13/2014	12:20	21.538970	-158.236960	30 ft	Yes
MB-S3-Hee108	MAK1070	3	1/13/2014	13:05	21.541534	-158.238456	30-40 ft	Yes
MB-S1-Hee109	MAK1080	1	1/13/2014	14:20	21.544824	-158.244449	32 ft	Yes

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
Sea Cucumber (Loli)								
Dry Season								
MB-S6-Loli001	MAK003C	6	9/9/2013	10:58	*21.5359333* (21° 32.156)	*-158.2345167* (-158° 14.071)	50 ft	No (Archived at ARDL)
MB-S6-Loli002	MAK002C	6	9/9/2013	12:27	*21.53595* (21° 32.157)	*-158.2358167* (-158° 14.149)	50 ft	Yes
MB-S17-Loli003	MAK001C	17	9/9/2013	14:03	*21.5158833* (21° 30.953)	*-158.2308167* (-158° 13.849)	28 ft	Yes
MB-S17-Loli004	MAK001C EXTRA	17	9/9/2013	14:03	*21.5158833* (21° 30.953)	*-158.2308167* (-158° 13.849)	28 ft	No (Archived at ARDL)
MB-S16-Loli005	MAK004C	16	9/9/2013	4:20	*21.5176167* (21° 31.057)	*-158.231* (-158° 13.860)	26 ft	Yes
MB-S12-Loli006	MAK005C	12	9/9/2013	15:19	*21.5254* (21° 31.524)	*-158.2313* (-158° 13.878)	15 ft	Yes
MB-S12-Loli007	MAK005C EXTRA	12	9/9/2013	15:22	*21.52545* (21° 31.527)	*-158.2314167* (-158° 13.885)	30 ft	No (Archived at ARDL)
MB-S8-Loli008	MAK006C	8	9/11/2013	10:05	*21.53225* (21° 31.935)	*-158.2326* (-158° 13.956)	*36 ft* (11.0 m)	Yes
MB-S8-Loli008	MAK006C EXTRA	8	9/11/2013	10:05	*21.53225* (21° 31.935)	*-158.2326* (-158° 13.956)	*36 ft* (11.0 m)	No (Archived at ARDL)
MB-S7-Loli009	MAK007C	7	9/11/2013	10:30	*21.5338833* (21° 32.033)	*-158.23395* (-158° 14.037)	*46.3 ft* (14.1 m)	Yes
MB-S5-Loli010	MAK008C	5	9/11/2013	11:15	*21.53855* (21° 32.313)	*-158.2359333* (-158° 14.156)	*33.5 ft)* (10.2 m	Yes
MB-S4-Loli011	MAK009C	4	9/11/2013	11:35	*21.5396333* (21° 32.378)	*-158.2379* (-158° 14.274)	*39.4 ft* (12.0 m)	Yes
Wet Season								
MB-S17+-Loli101	MAK101C EXTRA	17+	1/13/2014	09:10	21.514985	-158.230117	17 ft	No (Archived at ARDL)
MB-S15-Loli102	MAK102C	15	1/13/2014	10:02	21.519654	-158.230449	20 ft	Yes
MB-S11-Loli103	MAK103C	11	1/13/2014	10:22	21.527260	-158.231744	25 ft	Yes
MB-S11-Loli104	Extra C-A	11	1/13/2014	10:30	21.527235	-158.231754	25 ft	No (Archived at ARDL)
MB-S11-Loli105	Extra C-B	11	1/13/2014	10:40	21.526901	-158.230246	30 ft	No (Archived at ARDL)
MB-S8-Loli106	MAK104C	8	1/13/2014	11:00	21.531762	-158.231814	35-40 ft	Yes

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
MB-S8-Loli107	Extra C-C	8	1/13/2014	11:08	21.532579	-158.231537	35-40 ft	No (Archived at ARDL)
MB-S7-Loli108	MAK105C	7	1/13/2014	11:30	21.534416	-158.232106	30 ft	Yes
MB-S5-Loli109	MAK106C	5	1/13/2014	12:05	21.538025	-158.233604	20 ft	Yes
MB-S4-Loli110	MAK107C	4	1/13/2014	12:40	21.539488	-158.236551	20 ft	Yes
MB-S3-Loli111	MAK108C	3	1/13/2014	13:50	21.541027	-158.238178	24 ft	Yes
MB-S6-Loli112	MAK109C EXTRA	6	1/14/2014	09:17	21.535244	-158.234799	20 ft	No (Archived at ARDL)
MB-S12-Loli113	MAK110C	12	1/14/2014	09:55	21.525602	-158.232493	45 ft	Yes
MB-S15-Loli114	Extra C-D	15	1/14/2014	11:30	21.519611	-158.230380	20 ft	No (Archived at ARDL)
Mokulēʻia								
Seaweed (limu kohu) *Dry Season*								
MK-S1-Limu003	MAK003L	1	9/13/2013	11:33	21.581799	-158.204367	5 ft	No (Archived at ARDL)
MK-S18-Limu004; MK-S18-Limu005	MAK004L (comp)	18	9/13/2013	14:10 (Li004); 14:20 (Li005)	21.580841	-158.171966	5-6 ft	No (Archived at ARDL)
MK-S16-Limu009	MAK005L	16	9/16/2013	10:40	21.581051	-158.175385	2-3 ft	No (Archived at ARDL)
MK-S10-Limu010	MAK006L	10	9/16/2013	11:40	21.582277	-158.187190	3 ft	No (Archived at ARDL)
MK-S8-Limu011	MAK007L	8	9/16/2013	13:20	21.582754	-158.191196	6-8 ft	Yes
MK-S6-Limu012	MAK008L	6	9/16/2013	14:10	21.581479	-158.195415	6 ft	No (Archived at ARDL)
MK-S4-Limu013	MAK009L	4	9/16/2013	14:33	21.582076	-158.198123	1-2 ft	Yes
MK-S3-Limu014; MK-S3-Limu015	MAK010L (comp)	3	9/16/2013	15:15 (Li014); 15:18 (Li015)	21.582670	-158.200319	3-4 ft	Yes
MK-S10-Limu046	MAK044L	10	10/15/2013	09:25	21.582365	-158.187430	2 ft	Yes
MK-S6-Limu047	MAK045L	6	10/15/2013	10:25	21.581622	-158.195935	1-3 ft	Yes
MK-S1-Limu048	MAK046L	1	10/15/2013	11:05	21.581888	-158.204715	1-2 ft	Yes
MK-S16-Limu049	MAK047L	16	10/15/2013	11:58	21.581154	-158.175123	2-3 ft	Yes
MK-S16-Limu050	MAK048L	16	10/15/2013	11:58	21.581154	-158.175123	2-3 ft	No (Archived at ARDL)
MK-S18-Limu051	MAK049L	18	10/15/2013	12:25	21.580907	-158.172259	3 ft	Yes
MK-S18-Limu052	MAK050L	18	10/15/2013	12:25	21.580907	-158.172259	3 ft	No (Archived at ARDL)

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
Wet Season								
MK-S6-Limu122	MAK120L	6	1/31/2014	10:40	21.581534	-158.195688	0 ft	Yes
MK-S7-Limu123	MAK121L	7	1/31/2014	11:30	21.581968	-158.193277	0 ft	Yes
MK-S11S12-Limu124	MAK122L	11/12	1/31/2014	14:05	21.581748	-158.184042	0 ft	Yes
MK-S13-Limu125	MAK123L	13	1/31/2014	14:55	21.581330	-158.182093	0 ft	Yes
MK-S16-Limu126	MAK124L	16	1/31/2014	15:40	21.581151	-158.175175	1 ft	Yes
MK-S16-Limu127	MAK125L EXTRA	16	1/31/2014	15:40	21.581151	-158.175175	1 ft	No (Archived at ARDL)
MK-S18-Limu128	MAK126L	18	1/31/2014	16:15	21.580964	-158.172287	2 ft	Yes
MK-S4-Limu129	MAK127L	4	2/11/2014	13:40	21.582594	-158.199230	0.5-1 ft	Yes
MK-S2-Limu130	MAK128L	2	2/11/2014	14:15	21.581698	-158.203070	0.5-1 ft	Yes
MK-S2-Limu131	MAK129L EXTRA	2	2/11/2014	14:25	21.581698	-158.203070	0.5-1 ft	No (Archived at ARDL)
Octopus (He'e)								
Dry Season								
MK-S24-Hee009	MAK009O	24	9/13/2013	12:48	21.579903	-158.160079	6 ft	Yes
MK-S16-Hee010	MAK010O	16	9/16/2013	10:25	21.581147	-158.175188	2 ft	Yes
MK-S10-Hee011	MAK011O	10	9/16/2013	11:10	21.582277	-158.187190	3 ft	Yes
MK-S26-Hee012	MAK015O	26	9/22/2013	08:30	21.588850	-158.153983	55 ft	Yes
MK-S13-Hee013	MAK016O	13	9/22/2013	11:15	21.591206	-158.181055	90 ft	Yes
MK-S8-Hee014	MAK017O	8	9/22/2013	11:40	21.591855	-158.191819	50 ft	Yes
MK-S3-Hee015	MAK018O	3	9/22/2013	12:06	21.591384	-158.201616	40 ft	Yes
MK-S3-Hee016	EXTRA B	3	9/22/2013	12:06	21.591384	-158.201616	40 ft	No (Archived at ARDL)
MK-S23-Hee026	MAK024O	23	9/27/2013	08:28	21.588672	-158.162160	40 ft	Yes
Wet Season								
MK-S6-Hee110	MAK109O	6	1/31/2014	10:45	21.581749	-158.195937	1 ft	Yes
MK-S24-Hee111	MAK118O	24	3/27/2014	08:50	21.588571	-158.159793	55 ft	Yes
MK-S22-Hee112	MAK119O	22	3/27/2014	09:20	21.588514	-158.163886	35 ft	Yes
MK-S16-Hee113	MAK120O	16	3/27/2014	11:23	21.591253	-158.175386	60 ft	Yes
MK-S13-Hee114	MAK121O	13	3/27/2014	12:05	21.590825	-158.180731	100 ft	Yes
MK-S10-Hee115	EXTRA O-C	10	3/27/2014	12:40	21.591841	-158.187953	55 ft	No (Archived at ARDL)
MK-S9-Hee116	MAK122O	9	3/27/2014	13:05	21.590745	-158.189227	50 ft	Yes
MK-S9-Hee117	EXTRA O-D	9	3/27/2014	13:05	21.590745	-158.189227	50 ft	No (Archived at ARDL)
MK-S3-Hee118	MAK123O	3	3/27/2014	15:08	21.589976	-158.201062	60 ft	Yes

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
MK-S2-Hee119b	MAK124O	2	3/28/2014	12:25	21.590233	-158.203111	40 ft	Yes
Sea Cucumber (Loli) *Dry Season*								
MK-S1-Loli015	EXTRA F	1	9/13/2013	11:28	21.581799	-158.204367	5 ft	No (Archived at ARDL)
MK-S1-Loli016	MAK010C	1	9/13/2013	11:28	21.581799	-158.204367	5 ft	Yes
MK-S26-Loli017; MK-S26-Loli018	EXTRA MAK011C (comp)	26	9/13/2013	12:14(Lo017); 12:16(Lo018)	21.580828	-158.155589	6-7 ft	No (Archived at ARDL)
MK-S26-Loli019	EXTRA M	26	9/13/2013	12:18	21.580752	-158.155835	6-7 ft	No (Archived at ARDL)
MK-S26-Loli020	EXTRA L	26	9/13/2013	12:18	21.580752	-158.155835	6-7 ft	No (Archived at ARDL)
MK-S24-Loli021	EXTRA J	24	9/13/2013	12:45	21.579897	-158.160083	6 ft	No (Archived at ARDL)
MK-S24-Loli022	EXTRA I	24	9/13/2013	12:45	21.579897	-158.160083	6 ft	No (Archived at ARDL)
MK-S24-Loli023; MK-S24-Loli024	EXTRA MAK012C (comp)	24	9/13/2013	12:45	21.579897	-158.160083	6 ft	No (Archived at ARDL)
MK-S19-Loli025; MK-S19-Loli026	MAK013C (comp)	19	9/13/2013	13:35	21.579634	-158.169739	5 ft	No (Archived at ARDL)
MK-S18-Loli027	MAK014C	18	9/13/2013	13:55	21.580720	-158.171701	6 ft	Yes
MK-S18-Loli028	EXTRA N	18	9/13/2013	13:55	21.580720	-158.171701	6 ft	No (Archived at ARDL)
MK-S18-Loli029	EXTRA K	18	9/13/2013	13:55	21.580720	-158.171701	6 ft	No (Archived at ARDL)
MK-S16-Loli032	MAK020C	16	9/16/2013	10:18	21.581051	-158.175385	2 ft	Yes
MK-S16-Loli032	EXTRA G	16	9/16/2013	10:18	21.581051	-158.175385	2 ft	No (Archived at ARDL)
MK-S10-Loli033	EXTRA MAK021C	10	9/16/2013	11:05	21.582250	-158.187216	3 ft	No (Archived at ARDL)
MK-S10-Loli034	EXTRA H	10	9/16/2013	11:16	21.582250	-158.187216	3 ft	No (Archived at ARDL)
MK-S9-Loli035	MAK022C	9	9/16/2013	11:50	21.582628	-158.189194	2-3 ft	Yes
MK-S9-Loli036	EXTRA MAK023C	9	9/16/2013	11:55	21.582628	-158.189194	2-3 ft	No (Archived at ARDL)
MK-S26-Loli037	MAK024C	26	9/22/2013	08:30	21.588850	-158.153983	55 ft	Yes
MK-S26-Loli037	EXTRA D	26	9/22/2013	08:30	21.588850	-158.153983	55 ft	No (Archived at ARDL)
MK-S20-Loli038	MAK025C	20	9/22/2013	09:06	21.591151	-158.168632	75 ft	Yes
MK-S14-Loli039	MAK026C	14	9/22/2013	10:18	21.590338	-158.178587	40 ft	Yes

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
MK-S8-Loli040	MAK027C	8	9/22/2013	11:40	21.591855	-158.191819	50 ft	Yes
MK-S8-Loli040	EXTRA C	8	9/22/2013	11:40	21.591855	-158.191819	50 ft	No (Archived at ARDL)
MK-S8-Loli041	EXTRA E	8	9/22/2013	11:40	21.591855	-158.191819	50 ft	No (Archived at ARDL)
Wet Season								
MK-S3-Loli115	MAK111C	3	1/31/2014	10:00	21.582735	-158.200416	1 ft	Yes
MK-S3-Loli115	EXTRA C -L	3	1/31/2014	10:00	21.582735	-158.200416	1 ft	No (Archived at ARDL)
MK-S6-Loli116	MAK112C EXTRA	6	1/31/2014	10:55	21.581534	-158.195688	1 ft	No (Archived at ARDL)
MK-S7-Loli117	MAK113C	7	1/31/2014	11:20	21.581968	-158.193277	2-3 ft	Yes
MK-S8-Loli118	MAK114C	8	1/31/2014	11:55	21.582651	-158.191448	2 ft	Yes
MK-S8-Loli119	EXTRA C-E	8	1/31/2014	12:20	21.582651	-158.191448	7-8 ft	No (Archived at ARDL)
MK-S10-Loli120	EXTRA C-F	10	1/31/2014	12:45	21.582468	-158.187348	3 ft	No (Archived at ARDL)
MK-S10-Loli121	MAK115C	10	1/31/2014	13:00	21.582468	-158.187348	4-5 ft	Yes
MK-S10-Loli121	EXTRA C-M	10	1/31/2014	13:00	21.582468	-158.187348	4-5 ft	No (Archived at ARDL)
MK-S11-Loli122	MAK116C	11	1/31/2014	13:30	21.581728	-158.184381	7 ft	Yes
MK-S11-Loli123	EXTRA C-G	11	1/31/2014	13:30	21.581728	-158.184381	7 ft	No (Archived at ARDL)
MK-S11-Loli124	EXTRA C-H	11	1/31/2014	13:30	21.581728	-158.184381	7 ft	No (Archived at ARDL)
MK-S11-Loli125	EXTRA C-I	11	1/31/2014	13:30	21.581728	-158.184381	7 ft	No (Archived at ARDL)
MK-S13-Loli126	MAK117C	13	1/31/2014	14:35	21.581330	-158.182093	2 ft	Yes
MK-S13-Loli127	EXTRA C- J	13	1/31/2014	14:35	21.581330	-158.182093	2 ft	No (Archived at ARDL)
MK-S18-Loli128	MAK118C	18	1/31/2014	16:05	21.580964	-158.172287	8 ft	Yes
MK-S18-Loli128	EXTRA C-K	18	1/31/2014	16:05	21.580964	-158.172287	8 ft	No (Archived at ARDL)
MK-S19-Loli129	MAK119C EXTRA	19	1/31/2014	16:45	21.579786	-158.170196	6 ft	No (Archived at ARDL)
MK-S24-Loli130	EXTRA C-N	24	2/11/2014	10:10	21.579959	-158.160466	5 ft	No (Archived at ARDL)
MK-S24-Loli131	EXTRA C-O	24	2/11/2014	10:12	21.579959	-158.160466	4 ft	No (Archived at ARDL)
MK-S23-Loli132	MAK120C	23	2/11/2014	10:30	21.580654	-158.162351	5 ft	Yes
MK-S23-Loli133	EXTRA C-P	23	2/11/2014	10:30	21.580654	-158.162351	5 ft	No (Archived

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
								at ARDL)
MK-S23-Loli134	EXTRA C-Q	23	2/11/2014	10:40	21.580654	-158.162351	4 ft	No (Archived at ARDL)
MK-S23-Loli135	EXTRA C-R	23	2/11/2014	10:40	21.580654	-158.162351	4 ft	No (Archived at ARDL)
MK-S10-Loli136	EXTRA C-S	10	2/11/2014	12:12	21.582506	-158.187795	4 ft	No (Archived at ARDL)
Ka'ena Point								
Seaweed (limu kohu)								
Dry Season								
KP-S24-Limu006	MAK011L	24	9/16/2013	07:50	21.580031	-158.237269	0.5-1 ft	Yes
KP-S24-Limu007	MAK028L	24	9/16/2013	08:40	21.579914	-158.236416	0.5-1 ft	No (Archived at ARDL)
KP-S26+-Limu008	MAK012L	26+	9/16/2013	09:20	21.579103	-158.230377	0.5-1 ft	No (Archived at ARDL)
KP-S26++-Limu017	MAK014L	26++	9/22/2013	13:00	21.589770	-158.228802	80 ft	No (Archived at ARDL)
KP-S24-Limu018	MAK015L	24	9/22/2013	14:00	21.587853	-158.236921	40 ft	No (Archived at ARDL)
KP-S21-Limu019	MAK017L	21	9/23/2013	09:00	21.587961	-158.242630	60 ft	No (Archived at ARDL)
KP-S19-Limu020	MAK018L	19	9/23/2013	09:45	21.586853	-158.245374	50 ft	No (Archived at ARDL)
KP-S16-Limu021	MAK019L	16	9/23/2013	10:20	21.584158	-158.251064	50 ft	No (Archived at ARDL)
KP-S23S24-Limu022	MAK020L	23/24	9/23/2013	12:10	21.588378; 21.588207	-158.237566; -158.237183	50 ft	No (Archived at ARDL)
KP-S26++-Limu031	MAK030L	26++	10/11/2013	09:50	21.585907	-158.230426	30-40 ft	Yes
KP-S26++-Limu032	MAK031L	26++	10/11/2013	09:55	21.585719	-158.230490	30-40 ft	No (Archived at ARDL)
KP-S26++-Limu033	MAK032L	26++	10/11/2013	10:50	21.586999	-158.230394	30-40 ft	No (Archived at ARDL)
KP-S26++-Limu034	MAK033L	26++	10/11/2013	10:50	21.586999	-158.230394	30-40 ft	Yes
KP-S26++-Limu035	MAK034L	26++	10/11/2013	10:50	21.586999	-158.230394	30-40 ft	Yes
KP-S21-Limu036	MAK035L	21	10/11/2013	12:20	21.586311	-158.241048	50-60 ft	No (Archived at ARDL)

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
KP-S21-Limu037	MAK036L	21	10/11/2013	12:22	21.586311	-158.241048	50-60 ft	No (Archived at ARDL)
KP-S21-Limu038	MAK037L	21	10/11/2013	13:01	21.585924	-158.241970	50-60 ft	No (Archived at ARDL)
KP-S21-Limu039	MAK038L	21	10/11/2013	13:01	21.585924	-158.241970	50-60 ft	Yes
KP-S21-Limu040	MAK039L	21	10/11/2013	13:01	21.585924	-158.241970	50-60 ft	No (Archived at ARDL)
KP-S16-Limu041	MAK040L	16	10/11/2013	14:00	21.583140	-158.252146	40 ft	No (Archived at ARDL)
KP-S16-Limu042	MAK041L	16	10/11/2013	14:00	21.583140	-158.252146	40 ft	Yes
KP-S16-Limu043	MAK042L	16	10/11/2013	14:00	21.583140	-158.252146	40 ft	Yes
KP-S16-Limu044	MAK043L	16	10/11/2013	14:00	21.583140	-158.252146	40 ft	Yes
Wet Season								
KP-S23S24-Limu118	MAK116L	23/24	1/31/2014	08:20	21.580044; 21.579878	-158.237240; -158.237566	0 ft	Yes
KP-S23-Limu119	MAK117L	23	1/31/2014	08:35	21.579847	-158.237868	0 ft	Yes
KP-S26+-Limu120	MAK118L	26+	1/31/2014	09:10	21.579131	-158.230191	0-0.5 ft	Yes
KP-S26+-Limu121	MAK119L EXTRA	26+	1/31/2014	09:10	21.579131	-158.230191	0-0.5 ft	No (Archived at ARDL)
KP-S26-Limu132	MAK130L	26	3/27/2014	08:20	21.585614	-158.232555	45 ft	Yes
KP-S26-Limu133	MAK131L EXTRA	26	3/27/2014	08:20	21.585614	-158.232555	45 ft	No (Archived at ARDL)
KP-S25-Limu134	MAK132L	25	3/28/2014	08:38	21.587317	-158.234769	60 ft	Yes
KP-S25-Limu135	MAK133L EXTRA	25	3/28/2014	08:38	21.587317	-158.234769	60 ft	No (Archived at ARDL)
KP-S22-Limu136	MAK134L	22	3/28/2014	09:20	21.586629	-158.240805	50 ft	Yes
KP-S18-Limu137	MAK135L	18	3/28/2014	10:00	21.585278	-158.247387	50 ft	Yes
KP-S18-Limu138	MAK136L EXTRA	18	3/28/2014	10:00	21.585278	-158.247387	50 ft	No (Archived at ARDL)
KP-S15-Limu139	MAK137L EXTRA	15	3/28/2014	10:35	21.584123	-158.253296	55 ft	No (Archived at ARDL)
KP-S20-Limu140	MAK138L	20	3/28/2014	11:32	21.585927	-158.243915	40 ft	Yes
KP-S20-Limu141	MAK139L EXTRA	20	3/28/2014	11:32	21.585927	-158.243915	40 ft	No (Archived at ARDL)
Octopus (He'e) *Dry Season*								
KP-S26++-Hee017	MAK0120	26++	9/22/2013	13:15	21.588322	-158.229964	70 ft	Yes
KP-S24-Hee018	MAK0130	24	9/22/2013	14:00	21.587853	-158.236921	40 ft	Yes
KP-S24b-Hee019	MAK0140	24b	9/23/2013	08:20	21.588184	-158.236598	55 ft	Yes

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
KP-S23-Hee020	MAK019O	23	9/23/2013	08:33	21.588182	-158.238117	50 ft	Yes
KP-S21-Hee021	MAK020O	21	9/23/2013	08:55	21.587961	-158.242630	60 ft	Yes
KP-S21-Hee022	EXTRA A	21	9/23/2013	09:00	21.587961	-158.242630	60 ft	No (Archived at ARDL)
KP-S19-Hee023	MAK021O	19	9/23/2013	09:27	21.586853	-158.245374	45 ft	Yes
KP-S16-Hee024	MAK022O	16	9/23/2013	10:20	21.584158	-158.251064	50 ft	Yes
KP-S13-Hee025	MAK023O	13	9/23/2013	11:36	21.585409	-158.257806	90 ft	Yes
Wet Season								
KP-S25-Hee119	MAK110O	25	3/28/2014	08:38	21.587317	-158.234769	60 ft	Yes
KP-S22-Hee120	MAK111O	22	3/28/2014	09:20	21.586629	-158.240805	50 ft	Yes
KP-S18-Hee121	MAK112O	18	3/28/2014	10:00	21.585278	-158.247387	50 ft	Yes
KP-S18-Hee122	EXTRA O-B	18	3/28/2014	10:00	21.585278	-158.247387	50 ft	No (Archived at ARDL)
KP-S15-Hee123	MAK113O	15	3/28/2014	10:35	21.584123	-158.253296	55 ft	Yes
KP-S20-Hee124	MAK114O	20	3/28/2014	11:32	21.585927	-158.243915	40 ft	Yes
KP-S26+-Hee125	MAK115O	26+	3/28/2014	13:01	21.589071	-158.231271	60 ft	Yes
KP-S21-Hee126	MAK116O	21	3/28/2014	14:58	21.586836	-158.242649	70 ft	Yes
KP-S14-Hee127	MAK117O	14	3/28/2014	16:43	21.583460	-158.255437	60 ft	Yes
Sea Cucumber (Loli) *Dry Season*								
KP-S11-Loli012; KP-S11-Loli013; KP-S11-Loli014	MAK015C	11	9/13/2013	09:58(Lo012); 10:01(Lo013); 10:07(Lo014)	21.577558	-158.260765	6 ft	Yes
KP-S26-Loli030	MAK018C	26	9/16/2013	09:05	21.579483	-158.232338	4 ft	Yes
KP-S26+-Loli031	MAK019C	26+	9/16/2013	09:15	21.579103	-158.230377	0.5-1 ft	Yes
KP-S26++-Loli042	MAK028C	26++	9/22/2013	13:00	21.589770	-158.228802	80 ft	Yes
KP-S24b-Loli043	MAK029C	24b	9/23/2013	08:20	21.588184	-158.236598	55 ft	Yes
KP-S23-Loli044	MAK030C	23	9/23/2013	08:33	21.588182	-158.238117	50 ft	Yes
KP-S13-Loli045	MAK031C	13	9/23/2013	10:50	21.583184	-158.258347	80 ft	Yes
KP-S23S24-Loli046	MAK032C	23/24	9/23/2013	12:10	21.588378; 21.588207	-158.237566; -158.237183	50 ft	Yes
Wet Season								
KP-S15-Loli137	MAK121C	15	3/28/2014	10:35	21.584123	-158.253296	55 ft	Yes
KP-S15-Loli138	EXTRA C-T	15	3/28/2014	10:35	21.584123	-158.253296	55 ft	No (Archived at ARDL)
KP-S26+-Loli139	MAK122C	26+	3/28/2014	13:01	21.589071	-158.231271	60 ft	Yes
KP-S24-Loli140	MAK123C	24	3/28/2014	14:06	21.587989	-158.235799	65 ft	Yes

Field IDs[1]	Laboratory IDs	Segment No.[1]	Collection Date	Collection Time	Latitude[2]	Longitude[2]	Approximate Depth[2]	Analyzed by Laboratory
KP-S22-Loli141	MAK124C	22	3/28/2014	15:20	21.582223	-158.239441	25 ft	Yes
KP-S21-Loli142	MAK125C	21	3/28/2014	15:30	21.582037	-158.241668	20 ft	Yes
KP-S20-Loli143	MAK126C	20	3/28/2014	15:47	21.582149	-158.243480	20 ft	Yes
KP-S17-Loli144	MAK127C	17	3/28/2014	16:10	21.580788	-158.250310	25 ft	Yes
KP-S17-Loli145	EXTRA C-U	17	3/28/2014	16:10	21.580788	-158.250310	25 ft	No (Archived at ARDL)
KP-S14-Loli146	EXTRA C-V	14	3/28/2014	16:28	21.580097	-158.256532	20 ft	No (Archived at ARDL)
KP-S14-Loli147	MAK128C	14	3/28/2014	16:43	21.583460	-158.255437	60 ft	Yes

Notes:

[1] A Field ID or Segment No. with "+" or "++" (e.g., KP-S26+-Loli139) indicates that the sample was collected beyond the specified segment boundary. The "++" was used to designate a different location from a "+" sample and was generally further away from the end of the segment boundary.

[2] Converted coordinates and depth measurements are italicized.

Acronyms/Abbreviations:

ARDL - Applied Research & Development Laboratory
ft – feet
ID – identification
m – meter
No. – number

Appendix D: Laboratory Reports

(Included as a separate file)

Appendix E: Data Validation Reports

(Included as a separate file)

Appendix F: Data Summary Table

Table F-1: Concentrations of Volatile Organic Compounds in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Toluene					Ethyl Benzene					m,p-xylenes					Styrene					o-Xylene					1,2,4-Trimethylbenzene				
CAS Number		*108-88-3*					*100-41-4*					*108-38-3*					*100-42-5*					*95-47-6*					*95-63-6*				
Project Screening Values[1]		*320,000*					*3,640*					*800,000*					*800,000*					*800,000*					*not defined*				
Units		*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**
Mākua																															
Octopus (He'e)																															
Dry Season																															
MAK001O	9/9/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK002O	9/9/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK003O	9/9/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK004O	9/11/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK005O	9/11/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK006O	9/11/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK007O	9/11/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK008O	9/11/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Wet Season																															
MAK101O	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK102O	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK103O	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK104O	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK105O	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK106O	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK107O	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK108O	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Sea Cucumber (Loli)																															
Dry Season																															
MAK001C	9/9/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK002C	9/9/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK004C	9/9/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK005C	9/9/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK006C	9/11/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK007C	9/11/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK008C	9/11/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK009C	9/11/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Wet Season																															
MAK102C	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK103C	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK104C	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK105C	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK106C	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK107C	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK108C	1/13/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK110C	1/14/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Seaweed (Limu kohu)																															
Dry Season																															
MAK001L/2L/26L	9/9/2013; 9/10/2013; 9/27/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK013L	9/18/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK016L/21L/27L	9/23/2013; 9/27/2013; 9/27/2013	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		25.0	5.0	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		12.5	2.5
MAK022L	9/27/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK023L	9/27/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK024L/25L	9/27/2013; 9/27/2013	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		25.0	5.0	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		12.5	2.5
MAK025L	9/27/2013	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		25.0	5.0	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		12.5	2.5
MAK029L	10/11/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
Wet Season																															
MAK101L	1/13/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U	UJ	25.0	5.0	ND	U	UJ	25.0	5.0	ND	U		25.0	5.0
MAK102L	1/13/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK105L	1/13/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK106L	1/14/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK108,109,110,113L	1/14/2014; 1/14/2014; 1/14/2014; 1/14/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK111L	1/14/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK112L	1/14/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK115L	1/14/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0

Draft

Table F-1: Concentrations of Volatile Organic Compounds in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Toluene					Ethyl Benzene					m,p-xylenes					Styrene					o-Xylene					1,2,4-Trimethylbenzene				
CAS Number		*108-88-3*					*100-41-4*					*108-38-3*					*100-42-5*					*95-47-6*					*95-63-6*				
Project Screening Values[1]		*320,000*					*3,640*					*800,000*					*800,000*					*800,000*					*not defined*				
Units		*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**
Mokulēʻia																															
Octopus (Heʻe)																															
Dry Season																															
MAK009O	9/13/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK010O	9/16/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK011O	9/16/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK015O	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK016O	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK017O	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK018O	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK024O	9/27/2013	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		25.0	5.0	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		12.5	2.5
Wet Season																															
MAK109O	1/31/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK118O	3/27/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK119O	3/27/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK120O	3/27/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK121O	3/27/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK122O	3/27/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK123O	3/27/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK124O	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Sea Cucumber (Loli)																															
Dry Season																															
MAK010C	9/13/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK014C	9/13/2013	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		25.0	5.0	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		12.5	2.5
MAK020C	9/16/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK022C	9/16/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK024C	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK025C	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK026C	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK027C	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Wet Season																															
MAK111C	1/31/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK113C	1/31/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK114C	1/31/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK115C	1/31/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK116C	1/31/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK117C	1/31/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK118C	1/31/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK120C	2/11/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Seaweed (Limu kohu)																															
Dry Season																															
MAK007L	9/16/2013	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		25.0	5.0	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		12.5	2.5
MAK009L	9/16/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK010L (comp)	9/16/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK044L	10/15/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK045L	10/15/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK046L	10/15/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK047L	10/15/2013	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		25.0	5.0	ND	U	UJ	12.5	2.5	ND	U		12.5	2.5	ND	U		12.5	2.5
MAK049L	10/15/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U	UJ	25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
Wet Season																															
MAK120L	1/31/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK121L	1/31/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK122L	1/31/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK123L	1/31/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U	UJ	25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK124L	1/31/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK126L	1/31/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK127L	2/11/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK128L	2/11/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0

Draft

Table F-1: Concentrations of Volatile Organic Compounds in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Toluene					Ethyl Benzene					m,p-xylenes					Styrene					o-Xylene					1,2,4-Trimethylbenzene				
CAS Number		*108-88-3*					*100-41-4*					*108-38-3*					*100-42-5*					*95-47-6*					*95-63-6*				
Project Screening Values[1]		*320,000*					*3,640*					*800,000*					*800,000*					*800,000*					*not defined*				
Units		*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**
Ka'ena Point																															
Octopus (He'e)																															
Dry Season																															
MAK012O	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK013O	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK014O	9/23/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK019O	9/23/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK020O	9/23/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK021O	9/23/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK022O	9/23/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK023O	9/23/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Wet Season																															
MAK110O	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK111O	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK112O	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK113O	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK114O	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK115O	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK116O	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK117O	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Sea Cucumber (Loli)																															
Dry Season																															
MAK015C	9/13/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK018C	9/16/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK019C	9/16/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK028C	9/22/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK029C	9/23/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK030C	9/23/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK031C	9/23/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK032C	9/23/2013	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Wet Season																															
MAK121C	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK122C	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK123C	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK124C	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK125C	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK126C	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK127C	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
MAK128C	3/28/2014	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		25.0	5.0	ND	U		12.5	2.50	ND	U		12.5	2.50	ND	U		12.5	2.50
Seaweed (Limu kohu)																															
Dry Season																															
MAK011L	9/16/2013	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		25.0	5.0	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		12.5	2.5
MAK030L	10/11/2013	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		25.0	5.0	ND	U		12.5	2.5	ND	U		12.5	2.5	ND	U		12.5	2.5
MAK033L	10/11/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK034L	10/11/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK038L	10/11/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK041L	10/11/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK042L	10/11/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK043L	10/11/2013	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
Wet Season																															
MAK116L	1/31/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK117L	1/31/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK118L	1/31/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK130L	3/27/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK132L	3/28/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK134L	3/28/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK135L	3/28/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0
MAK138L	3/28/2014	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		50.0	10.0	ND	U		25.0	5.0	ND	U		25.0	5.0	ND	U		25.0	5.0

Notes:

[1] Final screening values from fish advisories as listed in Table 9 of the *Final Supplemental Marine Resources Study Sampling and Analysis Plan* (August 2013).

[2] Results presented as "ND" in the the ARDL laboratory reports are presented in the Staged Electronic Data Deliverable files with a "U" qualifier and are thus presented in this table with the LQ.

µg/kg-wet - micrograms per kilogram-wet weight
CAS - Chemical Abstracts Service
ID - identification
ND - not detected
MDL - method detection limit
RL - reporting limit

Laboratory Qualifier (LQ)

U - Indicates compound was analyzed for but not detected.

Validator Qualifier (VQ)

UJ - Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

Draft

Table F-2: Concentrations of Semivolatile Organic Compounds in Biota Tissue, Mākua Marine Resources Supplemental Study

		Analyte	Dimethylphthalate					Diethylphthalate					di-n-Butylphthalate					Pyrene					bis(2-Ethylhexyl)phthalate					di-n-Octylphthalate					Pentachlorophenol				
		CAS Number	131-11-3					84-66-2					84-74-2					129-00-0					117-81-7					117-84-0					87-86-5				
		Project Screening Values[1]	not defined					3,200,000					400,000					120,000					2,860					48,000					100				
		Units	µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet				
		Laboratory/Analytical Method	ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ERDC-ECB/EPA 8270C				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL
Mākua																																						
Octopus (He'e)																																						
Dry Season																																						
MAK001O	9/9/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	566	300
MAK002O	9/9/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	498	300
MAK003O	9/9/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	585	300
MAK004O	9/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		585	300
MAK005O	9/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		548	300
MAK006O	9/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		566	300
MAK007O	9/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		571	300
MAK008O	9/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		571	300
Wet Season																																						
MAK101O	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		561	300
MAK102O	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		548	300
MAK103O	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		548	300
MAK104O	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		571	300
MAK105O	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		591	300
MAK106O	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		548	300
MAK107O	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		585	300
MAK108O	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		574	300
Sea Cucumber (Loli)																																						
Dry Season																																						
MAK001C	9/9/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	580	300
MAK002C	9/9/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	588	300
MAK004C	9/9/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	571	300
MAK005C	9/9/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	548	300
MAK006C	9/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		541	300
MAK007C	9/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		603	300
MAK008C	9/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		548	300
MAK009C	9/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		571	300
Wet Season																																						
MAK102C	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		553	300
MAK103C	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		571	300
MAK104C	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	594	300
MAK105C	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		577	300
MAK106C	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	594	300
MAK107C	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		600	300
MAK108C	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	600	300
MAK110C	1/14/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		569	300
Seaweed (Limu kohu)																																						
Dry Season																																						
MAK001L/2L/26L	9/9/2013; 9/10/2013; 9/27/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	597	300
MAK013L	9/18/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		556	300
MAK016L/21L/27L	9/23/2013; 9/27/2013; 9/27/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	580	300
MAK022L	9/27/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		597	300
MAK023L	9/27/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		569	300
MAK024L/25L	9/27/2013; 9/27/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		585	300
MAK025L	9/27/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		300	300
MAK029L	10/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		566	300
Wet Season																																						
MAK101L	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		569	300
MAK102L	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		566	300
MAK105L	1/13/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		580	300
MAK106L	1/14/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		543	300
MAK108,109,110,113L	1/14/2014; 1/14/2014; 1/14/2014; 1/14/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		558	300
MAK111L	1/14/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		571	300
MAK112L	1/14/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	583	300
MAK115L	1/14/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		553	300

Table F-2: Concentrations of Semivolatile Organic Compounds in Biota Tissue, Mākua Marine Resources Supplemental Study

		Analyte	Dimethylphthalate					Diethylphthalate					di-n-Butylphthalate					Pyrene					bis(2-Ethylhexyl)phthalate					di-n-Octylphthalate					Pentachlorophenol				
		CAS Number	131-11-3					84-66-2					84-74-2					129-00-0					117-81-7					117-84-0					87-86-5				
		Project Screening Values[1]	not defined					3,200,000					400,000					120,000					2,860					48,000					100				
		Units	µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet				
		Laboratory/Analytical Method	ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ERDC-ECB/EPA 8270C				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL
Mokulē'ia																																						
Octopus (He'e)																																						
Dry Season																																						
MAK009O	9/13/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		571	300
MAK010O	9/16/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		558	300
MAK011O	9/16/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		536	300
MAK015O	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		517	300
MAK016O	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		577	300
MAK017O	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		545	300
MAK018O	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		574	300
MAK024O	9/27/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		580	300
Wet Season																																						
MAK109O	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		538	300
MAK118O	3/27/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		548	300
MAK119O	3/27/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		566	300
MAK120O	3/27/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		533	300
MAK121O	3/27/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		536	300
MAK122O	3/27/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		594	300
MAK123O	3/27/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		515	300
MAK124O	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		517	300
Sea Cucumber (Loli)																																						
Dry Season																																						
MAK010C	9/13/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		580	300
MAK014C	9/13/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		561	300
MAK020C	9/16/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		556	300
MAK022C	9/16/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		588	300
MAK024C	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	588	300
MAK025C	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		580	300
MAK026C	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		548	300
MAK027C	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		548	300
Wet Season																																						
MAK111C	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		566	300
MAK113C	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		541	300
MAK114C	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		524	300
MAK115C	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		563	300
MAK116C	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		517	300
MAK117C	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		558	300
MAK118C	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		563	300
MAK120C	2/11/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		566	300
Seaweed (Limu kohu)																																						
Dry Season																																						
MAK007L	9/16/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		588	300
MAK009L	9/16/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		600	300
MAK010L (comp)	9/16/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		561	300
MAK044L	10/15/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		553	300
MAK045L	10/15/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		556	300
MAK046L	10/15/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		580	300
MAK047L	10/15/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	585	300
MAK049L	10/15/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		569	300
Wet Season																																						
MAK120L	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	574	300
MAK121L	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	569	300
MAK122L	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	583	300
MAK123L	1/31/2014	ND	U		1,000	200	1,520		J	1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	574	300
MAK124L	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	580	300
MAK126L	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	563	300
MAK127L	2/11/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		553	300
MAK128L	2/11/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		545	300

Table F-2: Concentrations of Semivolatile Organic Compounds in Biota Tissue, Mākua Marine Resources Supplemental Study

		Analyte	Dimethylphthalate					Diethylphthalate					di-n-Butylphthalate					Pyrene					bis(2-Ethylhexyl)phthalate					di-n-Octylphthalate					Pentachlorophenol				
		CAS Number	131-11-3					84-66-2					84-74-2					129-00-0					117-81-7					117-84-0					87-86-5				
		Project Screening Values[1]	not defined					3,200,000					400,000					120,000					2,860					48,000					100				
		Units	µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet				
		Laboratory/Analytical Method	ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ARDL/EPA 8270C					ERDC-ECB/EPA 8270C				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL
Ka'ena Point																																						
***Octopus* (*He'e*)**																																						
Dry Season																																						
MAK012O	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		585	300
MAK013O	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		566	300
MAK014O	9/23/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	588	300
MAK019O	9/23/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	214	J	J	1,000	200	ND	U		1,000	200	**ND***	U		545	300
MAK020O	9/23/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	413	J	J	1,000	200	ND	U		1,000	200	**ND***	U		580	300
MAK021O	9/23/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		580	300
MAK022O	9/23/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		591	300
MAK023O	9/23/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		591	300
Wet Season																																						
MAK110O	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		563	300
MAK111O	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		526	300
MAK112O	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		574	300
MAK113O	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		545	300
MAK114O	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		519	300
MAK115O	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		536	300
MAK116O	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		571	300
MAK117O	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		597	300
***Sea Cucumber* (*Loli*)**																																						
Dry Season																																						
MAK015C	9/13/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		594	300
MAK018C	9/16/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		541	300
MAK019C	9/16/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		556	300
MAK028C	9/22/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		594	300
MAK029C	9/23/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		548	300
MAK030C	9/23/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		566	300
MAK031C	9/23/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		571	300
MAK032C	9/23/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		553	300
Wet Season																																						
MAK121C	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		561	300
MAK122C	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		594	300
MAK123C	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		550	300
MAK124C	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		594	300
MAK125C	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		541	300
MAK126C	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		606	300
MAK127C	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		563	300
MAK128C	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		606	300
Seaweed (Limu kohu)																																						
Dry Season																																						
MAK011L	9/16/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		597	300
MAK030L	10/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		566	300
MAK033L	10/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		588	300
MAK034L	10/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		594	300
MAK038L	10/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		574	300
MAK041L	10/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		558	300
MAK042L	10/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		558	300
MAK043L	10/11/2013	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		580	300
Wet Season																																						
MAK116L	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		569	300
MAK117L	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		553	300
MAK118L	1/31/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U	UJ	1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U	UJ	543	300
MAK130L	3/27/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		550	300
MAK132L	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		526	300
MAK134L	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		580	300
MAK135L	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		536	300
MAK138L	3/28/2014	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	ND	U		1,000	200	**ND***	U		543	300

Notes:

ND* - RL exceeds the project screening value.

[1] Final screening values from fish advisories as listed in Table 9 of the *Final Supplemental Marine Resources Study Sampling and Analysis Plan* (August 2013).

[2] Results presented as "ND" in the the Applied Research Development Laboratory, Inc. (ARDL) and U.S. Army Engineer Research and Development Center-Environmental Chemistry Branch (ERDC-ECB) laboratory reports are presented in the Staged Electronic Data Deliverable files (ARDL) and Electronic Data Deliverable file (ERDC-ECB) with a "U" qualifier and are thus presented in this table with the LQ.

µg/kg-wet - micrograms per kilogram-wet weight
CAS - Chemical Abstracts Service
EPA - U.S. Environmental Protection Agency
ID - identification

ND - not detected
MDL - method detection limit
RL - reporting limit
U.S. - United States

Laboratory qualifier (LQ) - ARDL

J - Indicates an estimated value. This flag is used when estimating a concentration of a compound that meets identification criteria but the result is less than the quantitation or RL but greater than the MDL.

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

LQ - ERDC-ECB

U - Not detected at or above the RL.

Validator qualifier (VQ)

J - Indicates an estimated value.

UJ - Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

Table F-3: Concentrations of Organochlorine Pesticides in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		alpha-BHC					gamma-BHC (Lindane)					delta-BHC					Heptachlor					Aldrin					Heptachlor Epoxide					p,p'-DDT					beta-BHC				
CAS Number		319-84-6					58-89-9					319-86-8					76-44-8					309-00-2					1024-57-3					50-29-3					319-85-7				
Project Screening Values[1]		6.35					36.4					not defined					8.89					2.35[3]					4.40					118					22.2				
Units		µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL
Mākua																																									
Octopus (He'e)																																									
Dry Season																																									
MAK001O	9/9/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK002O	9/9/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK003O	9/9/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK004O	9/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK005O	9/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK006O	9/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK007O	9/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK008O	9/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
Wet Season																																									
MAK101O	1/13/2014	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	**ND***	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02
MAK102O	1/13/2014	ND	U		3.94	3.94	ND	U		3.94	3.94	ND	U		3.94	3.94	ND	U		3.94	3.94	**ND***	U		3.94	3.94	ND	U		3.94	3.94	ND	U		3.94	3.94	ND	U		3.94	3.94
MAK103O	1/13/2014	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	**ND***	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97
MAK104O	1/13/2014	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	**ND***	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00
MAK105O	1/13/2014	ND	U		3.96	3.96	ND	U		3.96	3.96	ND	U		3.96	3.96	ND	U		3.96	3.96	**ND***	U		3.96	3.96	ND	U		3.96	3.96	ND	U		3.96	3.96	ND	U		3.96	3.96
MAK106O	1/13/2014	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	**ND***	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02
MAK107O	1/13/2014	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	**ND***	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03
MAK108O	1/13/2014	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	**ND***	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02
Sea Cucumber (Loli)																																									
Dry Season																																									
MAK001C	9/9/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK002C	9/9/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK004C	9/9/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK005C	9/9/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK006C	9/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK007C	9/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK008C	9/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK009C	9/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
Wet Season																																									
MAK102C	1/13/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U	UJ	3.98	3.98	ND	U		3.98	3.98
MAK103C	1/13/2014	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	**ND***	U		3.99	3.99	ND	U		3.99	3.99	ND	U	UJ	3.99	3.99	ND	U		3.99	3.99
MAK104C	1/13/2014	ND	U		3.94	3.94	ND	U		3.94	3.94	ND	U		3.94	3.94	ND	U		3.94	3.94	**ND***	U		3.94	3.94	ND	U		3.94	3.94	ND	U	UJ	3.94	3.94	ND	U		3.94	3.94
MAK105C	1/13/2014	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	**ND***	U		4.00	4.00	ND	U		4.00	4.00	ND	U	UJ	4.00	4.00	ND	U		4.00	4.00
MAK106C	1/13/2014	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	**ND***	U		3.99	3.99	ND	U		3.99	3.99	ND	U	UJ	3.99	3.99	ND	U		3.99	3.99
MAK107C	1/13/2014	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	**ND***	U		4.00	4.00	ND	U		4.00	4.00	ND	U	UJ	4.00	4.00	ND	U		4.00	4.00
MAK108C	1/13/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U	UJ	3.98	3.98	ND	U		3.98	3.98
MAK110C	1/14/2014	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	**ND***	U		3.99	3.99	ND	U		3.99	3.99	ND	U	UJ	3.99	3.99	ND	U		3.99	3.99
Seaweed (Limu kohu)																																									
Dry Season																																									
MAK001L/2L/26L	9/9/2013; 9/10/2013; 9/27/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK013L	9/18/2013	**13.2**			4	4	ND	U		4	4	ND	U		4	4	**45.8**			4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK016L/21L/27L	9/23/2013; 9/27/2013; 9/27/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	**27.3**			4	4	**ND***	U		4	4	**83.9**			4	4	ND	U		4	4	ND	U		4	4
MAK022L	9/27/2013	**9.05**			4	4	ND	U		4	4	ND	U		4	4	**62.8**			4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK023L	9/27/2013	**14.0**			4	4	ND	U		4	4	ND	U		4	4	**57.4**			4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK024L/25L	9/27/2013; 9/27/2013	**13.3**			4	4	ND	U		4	4	ND	U		4	4	**67.0**			4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK025L	9/27/2013	**10.9**			4	4	ND	U		4	4	ND	U		4	4	**33.1**			4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK029L	10/11/2013	4.05			4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
Wet Season																																									
MAK101L	1/13/2014	ND	U		4.00	4.00	ND	U	UJ	4.00	4.00	ND	U	UJ	4.00	4.00	ND	U		4.00	4.00	**ND***	U	UJ	4.00	4.00	ND	U		4.00	4.00	ND	U	UJ	4.00	4.00	ND	U		4.00	4.00
MAK102L	1/13/2014	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	**ND***	U		3.97	3.97	ND	U		3.97	3.97	ND	U	UJ	3.97	3.97	ND	U		3.97	3.97
MAK105L	1/13/2014	ND	U	UJ	3.99	3.99	ND	U	UJ	3.99	3.99	ND	U	UJ	3.99	3.99	ND	U	UJ	3.99	3.99	**ND***	U	UJ	3.99	3.99	ND	U	UJ	3.99	3.99	ND	U	UJ	3.99	3.99	ND	U	UJ	3.99	3.99
MAK106L	1/14/2014	ND	U	UJ	4.00	4.00	ND	U	UJ	4.00	4.00	ND	U	UJ	4.00	4.00	ND	U	UJ	4.00	4.00	**ND***	U	UJ	4.00	4.00	ND	U	UJ	4.00	4.00	ND	U	UJ	4.00	4.00	ND	U	UJ	4.00	4.00
MAK108,109,110,113L	1/14/2014; 1/14/2014; 1/14/2014; 1/14/2014	ND	U	UJ	4.01	4.01	ND	U	UJ	4.01	4.01	ND	U	UJ	4.01	4.01	ND	U	UJ	4.01	4.01	**ND***	U	UJ	4.01	4.01	ND	U	UJ	4.01	4.01	ND	U	UJ	4.01	4.01	ND	U	UJ	4.01	4.01
MAK111L	1/14/2014	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	**ND***	U		4.00	4.00	ND	U		4.00	4.00	ND	U	UJ	4.00	4.00	ND	U		4.00	4.00
MAK112L	1/14/2014	ND	U		3.96	3.96	ND	U		3.96	3.96	ND	U		3.96	3.96	ND	U		3.96	3.96	**ND***	U		3.96	3.96	ND	U		3.96	3.96	ND	U	UJ	3.96	3.96	ND	U		3.96	3.96
MAK115L	1/14/2014	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	**ND***	U		3.99	3.99	ND	U		3.99	3.99	ND	U	UJ	3.99	3.99	ND	U		3.99	3.99

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Table F-3: Concentrations of Organochlorine Pesticides in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		alpha-BHC					gamma-BHC (Lindane)					delta-BHC					Heptachlor					Aldrin					Heptachlor Epoxide					p,p'-DDT					beta-BHC				
CAS Number		319-84-6					58-89-9					319-86-8					76-44-8					309-00-2					1024-57-3					50-29-3					319-85-7				
Project Screening Values[1]		6.35					36.4					not defined					8.89					2.35[3]					4.40					118					22.2				
Units		µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet					µg/kg-wet				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL
Mokulē'ia																																									
Octopus (He'e)																																									
Dry Season																																									
MAK009O	9/13/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK010O	9/16/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK011O	9/16/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK015O	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK016O	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK017O	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK018O	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK024O	9/27/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
Wet Season																																									
MAK109O	1/31/2014	ND	U		4.04	4.04	ND	U		4.04	4.04	ND	U		4.04	4.04	ND	U		4.04	4.04	**ND***	U		4.04	4.04	ND	U		4.04	4.04	ND	U		4.04	4.04	ND	U		4.04	4.04
MAK118O	3/27/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK119O	3/27/2014	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	**ND***	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03
MAK120O	3/27/2014	ND	U		4.04	4.04	ND	U		4.04	4.04	ND	U		4.04	4.04	ND	U		4.04	4.04	**ND***	U		4.04	4.04	ND	U		4.04	4.04	ND	U		4.04	4.04	ND	U		4.04	4.04
MAK121O	3/27/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK122O	3/27/2014	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	**ND***	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97
MAK123O	3/27/2014	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	**ND***	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03
MAK124O	3/28/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
Sea Cucumber (Loli)																																									
Dry Season																																									
MAK010C	9/13/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK014C	9/13/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK020C	9/16/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK022C	9/16/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK024C	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK025C	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK026C	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK027C	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
Wet Season																																									
MAK111C	1/31/2014	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	**ND***	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00
MAK113C	1/31/2014	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	**ND***	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00
MAK114C	1/31/2014	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	**ND***	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00
MAK115C	1/31/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK116C	1/31/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK117C	1/31/2014	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	**ND***	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97
MAK118C	1/31/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK120C	2/11/2014	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	**ND***	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00
Seaweed (Limu kohu)																																									
Dry Season																																									
MAK007L	9/16/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK009L	9/16/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK010L (comp)	9/16/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK044L	10/15/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK045L	10/15/2013	**22.7**			4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK046L	10/15/2013	**9.80**			4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK047L	10/15/2013	**11.9**			4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK049L	10/15/2013	**12.5**			4	4	ND	U		4	4	ND	U		4	4	ND	U	UJ	4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
Wet Season																																									
MAK120L	1/31/2014	-	U	R	3.99	3.99	-	U	R	3.99	3.99	-	U	R	3.99	3.99	-	U	R	3.99	3.99	-	U	R	3.99	3.99	-	U	R	3.99	3.99	-	U	R	3.99	3.99	-	U	R	3.99	3.99
MAK121L	1/31/2014	ND	U	UJ	3.98	3.98	ND	U	UJ	3.98	3.98	ND	U	UJ	3.98	3.98	ND	U	UJ	3.98	3.98	**ND***	U	UJ	3.98	3.98	ND	U	UJ	3.98	3.98	ND	U	UJ	3.98	3.98	ND	U	UJ	3.98	3.98
MAK122L	1/31/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK123L	1/31/2014	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	**ND***	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99
MAK124L	1/31/2014	ND	U	UJ	3.97	3.97	ND	U	UJ	3.97	3.97	ND	U	UJ	3.97	3.97	ND	U	UJ	3.97	3.97	**ND***	U	UJ	3.97	3.97	ND	U	UJ	3.97	3.97	ND	U	UJ	3.97	3.97	ND	U	UJ	3.97	3.97
MAK126L	1/31/2014	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	**ND***	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99
MAK127L	2/11/2014	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	**ND***	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99
MAK128L	2/11/2014	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	**ND***	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00

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Table F-3: Concentrations of Organochlorine Pesticides in Biota Tissue, Mākua Marine Resources Supplemental Study

		alpha-BHC					gamma-BHC (Lindane)					delta-BHC					Heptachlor					Aldrin					Heptachlor Epoxide					p,p'-DDT					beta-BHC				
Analyte		alpha-BHC					gamma-BHC (Lindane)					delta-BHC					Heptachlor					Aldrin					Heptachlor Epoxide					p,p'-DDT					beta-BHC				
CAS Number		*319-84-6*					*58-89-9*					*319-86-8*					*76-44-8*					*309-00-2*					*1024-57-3*					*50-29-3*					*319-85-7*				
Project Screening Values[1]		*6.35*					*36.4*					*not defined*					*8.89*					*2.35*[3]					*4.40*					*118*					*22.2*				
Units		*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**
Ka'ena Point																																									
Octopus (He'e)																																									
Dry Season																																									
MAK012O	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK013O	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK014O	9/23/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK019O	9/23/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK020O	9/23/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK021O	9/23/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK022O	9/23/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK023O	9/23/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
Wet Season																																									
MAK110O	3/28/2014	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	**ND***	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99
MAK111O	3/28/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK112O	3/28/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK113O	3/28/2014	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	**ND***	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97
MAK114O	3/28/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK115O	3/28/2014	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	**ND***	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97
MAK116O	3/28/2014	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	**ND***	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02
MAK117O	3/28/2014	ND	U		3.96	3.96	ND	U		3.96	3.96	ND	U		3.96	3.96	ND	U		3.96	3.96	**ND***	U		3.96	3.96	ND	U		3.96	3.96	ND	U		3.96	3.96	ND	U		3.96	3.96
Sea Cucumber (Loli)																																									
Dry Season																																									
MAK015C	9/13/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK018C	9/16/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK019C	9/16/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK028C	9/22/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK029C	9/23/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK030C	9/23/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK031C	9/23/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK032C	9/23/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
Wet Season																																									
MAK121C	3/28/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK122C	3/28/2014	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	**ND***	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02
MAK123C	3/28/2014	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	**ND***	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97	ND	U		3.97	3.97
MAK124C	3/28/2014	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	**ND***	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99
MAK125C	3/28/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK126C	3/28/2014	ND	U		4.01	4.01	ND	U		4.01	4.01	ND	U		4.01	4.01	ND	U		4.01	4.01	**ND***	U		4.01	4.01	ND	U		4.01	4.01	ND	U		4.01	4.01	ND	U		4.01	4.01
MAK127C	3/28/2014	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	**ND***	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03	ND	U		4.03	4.03
MAK128C	3/28/2014	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	**ND***	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02	ND	U		4.02	4.02
Seaweed (Limu kohu)																																									
Dry Season																																									
MAK011L	9/16/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK030L	10/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK033L	10/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK034L	10/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK038L	10/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK041L	10/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK042L	10/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
MAK043L	10/11/2013	ND	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4	**ND***	U		4	4	ND	U		4	4	ND	U		4	4	ND	U		4	4
Wet Season																																									
MAK116L	1/31/2014	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	**ND***	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00	ND	U		4.00	4.00
MAK117L	1/31/2014	**23.5**		J	3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	**ND***	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99	ND	U		3.99	3.99
MAK118L	1/31/2014	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	**ND***	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98	ND	U		3.98	3.98
MAK130L	3/27/2014	**42.2**		J	8.00	8.00	ND	U		8.00	8.00	ND	U		8.00	8.00	ND	U		8.00	8.00	**ND***	U		8.00	8.00	**ND***	U		8.00	8.00	ND	U		8.00	8.00	ND	U		8.00	8.00
MAK132L	3/28/2014	**ND***	U		19.9	19.9	ND	U		19.9	19.9	ND	U		19.9	19.9	**ND***	U		19.9	19.9	**ND***	U		19.9	19.9	**ND***	U		19.9	19.9	ND	U		19.9	19.9	ND	U		19.9	19.9
MAK134L	3/28/2014	**ND***	U		7.94	7.94	ND	U		7.94	7.94	ND	U		7.94	7.94	ND	U		7.94	7.94	**ND***	U		7.94	7.94	**ND***	U		7.94	7.94	ND	U		7.94	7.94	ND	U		7.94	7.94
MAK135L	3/28/2014	**ND***	U		20.0	20.0	ND	U		20.0	20.0	ND	U		20.0	20.0	**ND***	U		20.0	20.0	**ND***	U		20.0	20.0	**ND***	U		20.0	20.0	ND	U		20.0	20.0	ND	U		20.0	20.0
MAK138L	3/28/2014	**ND***	U		20.0	20.0	ND	U		20.0	20.0	ND	U		20.0	20.0	**ND***	U		20.0	20.0	**ND***	U		20.0	20.0	**ND***	U		20.0	20.0	ND	U		20.0	20.0	ND	U		20.0	20.0

Notes:

Bold results exceed the project screening values.

ND* - RL exceeds the project screening values.

[1] Final screening values from fish advisories as listed in Table 9 of the *Final Supplemental Marine Resources Study Sampling and Analysis Plan* (August 2013).

[2] Results presented as "ND" in the the ARDL laboratory reports are presented in the Staged Electronic Data Deliverable files with a "U" qualifier and are thus presented in this table with the LQ.

[3] As noted in Table 9 of the *Final Supplemental Marine Resources Study Sampling and Analysis Plan*, the RLs for aldrin exceed the project screening value.

µg/kg-wet - micrograms per kilogram-wet weight
BHC - benzene hexachloride
CAS - Chemical Abstracts Service
DDT - dichloro-diphenyl-trichloroethane
ID - identification
ND - not detected
MDL - method detection limit
RL - reporting limit

Laboratory Qualifier (LQ)
U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

Validator Qualifier (VQ)
J - Indicates an estimated value.
R - Quality control indicates the data is not usable.
UJ - Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

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Table F-4: Concentrations of Energetic Compounds in Biota Tissue, Mākua Marine Resources Supplemental Study

		Perchlorate					2,4-DNT[3]					2,4-DNT[5]					2,4-DNT[6]					RDX					Nitroglycerine				
Analyte		Perchlorate					2,4-DNT[3]					2,4-DNT[5]					2,4-DNT[6]					RDX					Nitroglycerine				
CAS Number		*14797-73-0*					*121-14-2*					*121-14-2*					*121-14-2*					*121-82-4*					*55-63-0*				
Project Screening Values[1]		*2,800*					*129*					*129*					*129*					*364*					*400*				
Units		*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*				
Laboratory/Analytical Method		*TestAmerica Sacramento/EPA 6850*					*ARDL/EPA 8330A*					*ARDL/EPA 8270C*					*ERDC-ECB/EPA 8330*					*ARDL/EPA 8330A*					*ARDL/EPA 8330A*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[4]**	**LQ**	**VQ**	**RL**	**MDL**	**Result**	**LQ**	**VQ**	**RL**	**MDL**	**Result[7,8]**	**LQ**	**VQ**	**RL[7]**	**MDL[7]**	**Result[4]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[4]**	**LQ**	**VQ**	**RL**	**MDL**
Mākua																															
Octopus (He'e)																															
Dry Season																															
MAK001O	9/9/2013	ND	U	UJ	10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK002O	9/9/2013	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK003O	9/9/2013	ND	U	UJ	9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK004O	9/11/2013	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK005O	9/11/2013	ND	U	UJ	9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK006O	9/11/2013	ND	U	UJ	9.5	0.28	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK007O	9/11/2013	0.62	J	J	9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK008O	9/11/2013	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Wet Season																															
MAK101O	1/13/2014	ND	U	UJ	9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK102O	1/13/2014	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK103O	1/13/2014	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK104O	1/13/2014	ND	U	UJ	9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK105O	1/13/2014	ND	U	UJ	10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK106O	1/13/2014	ND	U	UJ	10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK107O	1/13/2014	ND	U	UJ	10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK108O	1/13/2014	ND	U	UJ	10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Sea Cucumber (Loli)																															
Dry Season																															
MAK001C	9/9/2013	ND	U		9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK002C	9/9/2013	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK004C	9/9/2013	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK005C	9/9/2013	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK006C	9/11/2013	ND	U		9.5	0.28	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK007C	9/11/2013	ND	U		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK008C	9/11/2013	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK009C	9/11/2013	ND	U		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Wet Season																															
MAK102C	1/13/2014	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK103C	1/13/2014	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK104C	1/13/2014	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK105C	1/13/2014	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK106C	1/13/2014	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK107C	1/13/2014	ND	U		9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK108C	1/13/2014	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK110C	1/14/2014	ND	U		9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Seaweed (Limu kohu)																															
Dry Season																															
MAK001L/2L/26L	9/9/2013; 9/10/2013; 9/27/2013	ND	U	UJ	10	0.30	--			--	--	**ND***	U		1000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK013L	9/18/2013	ND	U	UJ	9.6	0.29	--			--	--	**ND***	U		1000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK016L/21L/27L	9/23/2013; 9/27/2013; 9/27/2013	ND	U	UJ	9.8	0.29	--			--	--	**ND***	U		1000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK022L	9/27/2013	ND	U	UJ	10	0.30	--			--	--	**ND***	U		1000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK023L	9/27/2013	ND	U	UJ	9.6	0.29	--			--	--	**ND***	U		1000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK024L/25L	9/27/2013	ND	U	UJ	9.7	0.29	--			--	--	**ND***	U		1000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK025L	9/27/2013	ND	U	UJ	9.9	0.30	--			--	--	**ND***	U		1000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK029L	10/11/2013	ND	U	UJ	10	0.30	--			--	--	**ND***	U		1000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
Wet Season																															
MAK101L	1/13/2014	ND	U	UJ	9.7	0.29	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK102L	1/13/2014	ND	U	UJ	9.9	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK105L	1/13/2014	ND	U	UJ	9.9	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK106L	1/14/2014	ND	U	UJ	9.7	0.29	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK108,109,110,113L	1/14/2014; 1/14/2014; 1/14/2014; 1/14/2014	ND	U	UJ	9.7	0.29	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK111L	1/14/2014	ND	U	UJ	9.9	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK112L	1/14/2014	ND	U	UJ	10	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK115L	1/14/2014	ND	U	UJ	9.6	0.29	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300

Table F-4: Concentrations of Energetic Compounds in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Perchlorate					2,4-DNT[3]					2,4-DNT[5]					2,4-DNT[6]					RDX					Nitroglycerine				
CAS Number		*14797-73-0*					*121-14-2*					*121-14-2*					*121-14-2*					*121-82-4*					*55-63-0*				
Project Screening Values[1]		*2,800*					*129*					*129*					*129*					*364*					*400*				
Units		*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*				
Laboratory/Analytical Method		*TestAmerica Sacramento/EPA 6850*					*ARDL/EPA 8330A*					*ARDL/EPA 8270C*					*ERDC-ECB/EPA 8330*					*ARDL/EPA 8330A*					*ARDL/EPA 8330A*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[4]**	**LQ**	**VQ**	**RL**	**MDL**	**Result**	**LQ**	**VQ**	**RL**	**MDL**	**Result[7,8]**	**LQ**	**VQ**	**RL[7]**	**MDL[7]**	**Result[4]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[4]**	**LQ**	**VQ**	**RL**	**MDL**
Mokulē'ia																															
Octopus (He'e)																															
Dry Season																															
MAK009O	9/13/2013	ND	U	UJ	9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK010O	9/16/2013	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK011O	9/16/2013	ND	U	UJ	9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK015O	9/22/2013	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK016O	9/22/2013	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK017O	9/22/2013	ND	U	UJ	9.5	0.28	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK018O	9/22/2013	ND	U	UJ	10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK024O	9/27/2013	ND	U	UJ	9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Wet Season																															
MAK109O	1/31/2014	ND	U	UJ	9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK118O	3/27/2014	0.45	J	J	9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK119O	3/27/2014	ND	IU	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK120O	3/27/2014	ND	U	UJ	10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK121O	3/27/2014	ND	U	UJ	9.5	0.28	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK122O	3/27/2014	ND	U	UJ	9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK123O	3/27/2014	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK124O	3/28/2014	ND	U	UJ	9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Sea Cucumber (Loli)																															
Dry Season																															
MAK010C	9/13/2013	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK014C	9/13/2013	ND	U		9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK020C	9/16/2013	ND	U		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK022C	9/16/2013	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK024C	9/22/2013	ND	U		9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK025C	9/22/2013	ND	U		9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK026C	9/22/2013	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK027C	9/22/2013	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Wet Season																															
MAK111C	1/31/2014	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK113C	1/31/2014	ND	U		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK114C	1/31/2014	ND	U		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK115C	1/31/2014	ND	U		9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK116C	1/31/2014	ND	IU		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK117C	1/31/2014	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK118C	1/31/2014	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK120C	2/11/2014	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Seaweed (Limu kohu)																															
Dry Season																															
MAK007L	9/16/2013	0.32	J	J	9.8	0.29	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK009L	9/16/2013	2.1	J	J	9.6	0.29	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK010L (comp)	9/16/2013	0.70	J	J	9.8	0.29	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK044L	10/15/2013	ND	U	UJ	9.7	0.29	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK045L	10/15/2013	3.9	J	J	10	0.30	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK046L	10/15/2013	0.38	J	J	9.8	0.29	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK047L	10/15/2013	1.3	J	J	9.5	0.28	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK049L	10/15/2013	1.7	J	J	9.8	0.29	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
Wet Season																															
MAK120L	1/31/2014	2.0	J	J	9.7	0.29	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK121L	1/31/2014	2.2	J	J	10	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK122L	1/31/2014	1.8	J	J	9.9	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK123L	1/31/2014	ND	U	UJ	9.5	0.28	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK124L	1/31/2014	8.7	J	J	9.9	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK126L	1/31/2014	12			9.7	0.29	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK127L	2/11/2014	0.65	J I	J	9.8	0.29	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK128L	2/11/2014	0.41	J	J	9.9	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300

Table F-4: Concentrations of Energetic Compounds in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Perchlorate					2,4-DNT[3]					2,4-DNT[5]					2,4-DNT[6]					RDX					Nitroglycerine				
CAS Number		*14797-73-0*					*121-14-2*					*121-14-2*					*121-14-2*					*121-82-4*					*55-63-0*				
Project Screening Values[1]		*2,800*					*129*					*129*					*129*					*364*					*400*				
Units		*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*				
Laboratory/Analytical Method		*TestAmerica Sacramento/EPA 6850*					*ARDL/EPA 8330A*					*ARDL/EPA 8270C*					*ERDC-ECB/EPA 8330*					*ARDL/EPA 8330A*					*ARDL/EPA 8330A*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[4]**	**LQ**	**VQ**	**RL**	**MDL**	**Result**	**LQ**	**VQ**	**RL**	**MDL**	**Result[7,8]**	**LQ**	**VQ**	**RL[7]**	**MDL[7]**	**Result[4]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[4]**	**LQ**	**VQ**	**RL**	**MDL**
Ka'ena Point																															
Octopus (He'e)																															
Dry Season																															
MAK012O	9/22/2013	ND	U	UJ	9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK013O	9/22/2013	ND	U	UJ	9.5	0.28	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK014O	9/23/2013	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK019O	9/23/2013	ND	U	UJ	9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK020O	9/23/2013	ND	U	UJ	9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK021O	9/23/2013	ND	U	UJ	9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK022O	9/23/2013	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK023O	9/23/2013	ND	U	UJ	9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Wet Season																															
MAK110O	3/28/2014	ND	U	UJ	10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK111O	3/28/2014	ND	U	UJ	9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK112O	3/28/2014	ND	U	UJ	9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK113O	3/28/2014	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK114O	3/28/2014	ND	U	UJ	9.8	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK115O	3/28/2014	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK116O	3/28/2014	ND	U	UJ	9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK117O	3/28/2014	ND	U	UJ	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Sea Cucumber (Loli)																															
Dry Season																															
MAK015C	9/13/2013	ND	U		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK018C	9/16/2013	ND	U		9.6	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK019C	9/16/2013	ND	U		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK028C	9/22/2013	ND	U		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK029C	9/23/2013	0.58	J	J	10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK030C	9/23/2013	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK031C	9/23/2013	ND	U		9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK032C	9/23/2013	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Wet Season																															
MAK121C	3/28/2014	0.79	J	J	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK122C	3/28/2014	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK123C	3/28/2014	ND	U		10	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK124C	3/28/2014	ND	U		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK125C	3/28/2014	ND	IU		9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK126C	3/28/2014	0.31	J I	J	9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK127C	3/28/2014	0.72	J	J	9.9	0.30	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
MAK128C	3/28/2014	0.35	J	J	9.7	0.29	**ND***	U		500	100	--			--	--	--			--	--	**ND***	U		500	200	**ND***	U		500	300
Seaweed (Limu kohu)																															
Dry Season																															
MAK011L	9/16/2013	ND	U	UJ	9.9	0.30	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK030L	10/11/2013	ND	U	UJ	9.8	0.29	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK033L	10/11/2013	0.38	J	J	9.5	0.28	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK034L	10/11/2013	0.53	J	J	9.8	0.29	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK038L	10/11/2013	ND	U	UJ	10	0.30	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK041L	10/11/2013	0.30	J	J	9.9	0.30	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK042L	10/11/2013	0.55	J	J	9.6	0.29	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
MAK043L	10/11/2013	0.45	J	J	9.7	0.29	--			--	--	**ND***	U		1,000	200	ND	U		100	10	**ND***	U		500	200	**ND***	U		500	300
Wet Season																															
MAK116L	1/31/2014	ND	U	UJ	9.9	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK117L	1/31/2014	ND	U	UJ	10	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK118L	1/31/2014	ND	U		9.4	0.28	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK130L	3/27/2014	0.56	J	J	10	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK132L	3/28/2014	0.32	J I	J	10	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK134L	3/28/2014	0.34	J I	J	10	0.30	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK135L	3/28/2014	0.74	J	J	9.7	0.29	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300
MAK138L	3/28/2014	0.32	J	J	9.6	0.29	--			--	--	--			--	--	**ND***	U		200	20	**ND***	U		500	200	**ND***	U		500	300

Notes:

Bold results exceed the project screening values.

ND* - RL exceeds the project screening value.

[1] Final screening values from fish advisories as listed in Table 9 of the *Final Supplemental Marine Resources Study Sampling and Analysis Plan* (August 2013).

[2] Results presented as "ND" in the the TestAmerica laboratory reports are presented in the Staged Electronic Data Deliverable (SEDD) files with a "U" qualifier and are thus presented in this table with the LQ.

[3] Applied Research Development Laboratory, Inc. (ARDL) encountered matrix interference problems in seaweed samples with the 8330A (HPLC) analysis of this analyte . Therefore the 8270C data for the dry season limu samples were reprocessed to add a result for 2,4-DNT, but these results were ultimately discarded in favor of using the higher resolution data from ERDC-ECB.

[4] Results presented as "ND" in the the ARDL laboratory reports are presented in the SEDD files with a "U" qualifier and are thus presented in this table with the LQ.

Table F-4: Concentrations of Energetic Compounds in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Perchlorate					2,4-DNT[3]					2,4-DNT[5]					2,4-DNT[6]					RDX					Nitroglycerine				
CAS Number		*14797-73-0*					*121-14-2*					*121-14-2*					*121-14-2*					*121-82-4*					*55-63-0*				
Project Screening Values[1]		*2,800*					*129*					*129*					*129*					*364*					*400*				
Units		*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*					*µg/kg-wet*				
Laboratory/Analytical Method		*TestAmerica Sacramento/EPA 6850*					*ARDL/EPA 8330A*					*ARDL/EPA 8270C*					*ERDC-ECB/EPA 8330*					*ARDL/EPA 8330A*					*ARDL/EPA 8330A*				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[4]	LQ	VQ	RL	MDL	Result	LQ	VQ	RL	MDL	Result[7,8]	LQ	VQ	RL[7]	MDL[7]	Result[4]	LQ	VQ	RL	MDL	Result[4]	LQ	VQ	RL	MDL

[5] 2,4-DNT results for seaweed from reprocessed 8270C data (conducted by ARDL).

[6] U.S. Army Engineer Research and Development Center-Environmental Chemistry Branch (ERDC-ECB) analyzed the seaweed samples for 2,4-DNT using EPA Method 8330.

[7] For consistency, the results, RL, and MDL were converted to µg/kg.

[8] Results presented as "ND" in the the ERDC-ECB laboratory reports are presented in the SEDD files with a "U" qualifier and are thus presented in this table with the LQ.

-- - not analyzed

µg/kg-wet - micrograms per kilogram-wet weight

CAS - Chemical Abstracts Service

DNT - dinitrotoluene

EPA - United States Environmental Protection Agency

ID - identification

MDL - method detection limit

ND - not detected

RDX - cyclotrimethylenetrinitramine

RL - reporting limit

Laboratory qualifier (LQ) - TestAmerica Sacramento

[J] - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

[U] - Indicates the compound was not detected at the RL (or MDL is shown).

[I] - Ion Ratio outside of limits, value is estimated maximum potential concentration (EMPC).

LQ - ARDL

[J] - Indicates an estimated value. This flag is used when estimating a concentration of a compound that meets identification criteria but the result is less than the quantitation or RL but greater than the MDL.

[U] - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilutionand for percent moisture.

LQ - ERDC-ECB

[U] - Indicates a compound was analyzed for but not detected at or above the RL.

Validator qualifier (VQ)

[J] - Indicates an estimated value.

[U] - Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

[UJ] - Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

Table F-5a: Concentrations of Dioxins/Dibenzofurans in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		2,3,7,8-TCDF				Total TCDF				2,3,7,8-TCDD				Total TCDD				1,2,3,7,8-PeCDF				2,3,4,7,8-PeCDF				Total PeCDF				1,2,3,7,8-PeCDD				Total PeCDD				1,2,3,4,7,8-HxCDF				1,2,3,6,7,8-HxCDF				2,3,4,6,7,8-HxCDF				1,2,3,7,8,9-HxCDF				Total HxCDF			
CAS Number		51207-31-9				30402-14-3				01746-01-6				41903-57-5				57117-41-6				57117-31-4				30402-15-4				40321-76-4				36088-22-9				70648-26-9				57117-44-9				60851-34-5				72918-21-9				55684-94-1			
Project Screening Values[1]		3.08				3.08				0.308				0.308				1.03				1.03				1.03				0.308				0.308				3.08				3.08				3.08				3.08				3.08			
Units		ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet			
Lab ID	Collection Date	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]
Mākua																																																												
Octopus (He'e)																																																												
Dry Season																																																												
MAK001O	9/9/2013	ND	BJZ	U	0.050	0.064		J	0.050	ND	U		0.079	**0.580**			0.079	ND	U		0.066	ND	U		0.049	ND	U		0.058	ND	U		0.110	ND	U		0.110	ND	U		0.067	ND	U		0.064	ND	U		0.056	ND	U		0.093	ND	U		0.070
MAK002O	9/9/2013	ND	U		0.071	ND	U		0.071	ND	U		0.097	**0.50**			0.097	ND	U		0.097	ND	U		0.087	ND	U		0.092	ND	U		0.150	ND	U		0.150	ND	U		0.110	ND	U		0.130	ND	U		0.110	ND	U		0.140	ND	U		0.120
MAK003O	9/9/2013	ND		U	0.081	0.097		J	0.081	ND	U		0.083	**0.350**			0.083	ND	U		0.075	ND	U		0.050	ND	U		0.062	ND	U		0.140	ND	U		0.140	ND	U		0.120	ND	U		0.110	ND	U		0.086	ND	U		0.160	ND	U		0.120
MAK004O	9/11/2013	ND	U		0.079	ND	U		0.079	ND	U		0.095	**0.49**			0.095	ND	U		0.120	ND	U		0.096	ND	U		0.110	ND	U		0.250	**1.40**			1.40	ND	U		0.140	ND	U		0.110	ND	U		0.120	ND	U		0.180	ND	U		0.140
MAK005O	9/11/2013	ND		U	0.057	0.170		J	0.057	ND	U		0.080	**0.440**			0.080	ND	U		0.062	ND	U		0.051	ND	U		0.057	ND	U		0.140	ND	U		0.140	ND	U		0.096	ND	U		0.089	ND	U		0.075	ND	U		0.120	ND	U		0.095
MAK006O	9/11/2013	ND	U		0.078	ND	U		0.078	ND	U		0.110	**0.42**			0.110	ND	U		0.067	ND	U		0.041	ND	U		0.054	ND	U		0.150	ND	U		0.150	ND	U		0.080	ND	U		0.080	ND	U		0.082	ND	U		0.130	ND	U		0.092
MAK007O	9/11/2013	ND		U	0.061	0.160		J	0.061	ND	U		0.080	ND	U		0.080	ND	U		0.075	ND	U		0.051	ND	U		0.063	ND	U		0.140	ND	U		0.140	ND	U		0.092	ND	U		0.077	ND	U		0.085	ND	U		0.094	ND	U		0.087
MAK008O	9/11/2013	ND	U		0.084	ND	U		0.084	ND	U		0.100	ND	U		0.100	ND	U		0.097	ND	U		0.064	ND	U		0.080	ND	U		0.130	ND	U		0.130	ND	U		0.140	ND	U		0.120	ND	U		0.120	ND	U		0.180	ND	U		0.140
Wet Season																																																												
MAK101O	1/13/2014	0.074	JZ	J	0.028	0.100			0.028	ND	U		0.034	ND	U		0.034	ND	U		0.052	ND	U		0.039	ND	U		0.045	ND	U		0.049	ND	U		0.049	0.034	JZ		0.028	ND	U		0.029	ND		U	0.027	ND	U		0.034	0.037			0.029
MAK102O	1/13/2014	0.065	JZ	J	0.038	0.060			0.038	ND	U		0.037	0.092			0.037	ND	U		0.049	ND	U		0.029	ND	U		0.039	ND	U		0.038	ND	U		0.038	ND	U		0.044	ND	U		0.040	ND	U		0.039	ND	U		0.043	ND	U		0.041
MAK103O	1/13/2014	0.070	JZ	J	0.040	0.110			0.040	ND	U		0.038	ND	U		0.038	ND	U		0.056	ND	U		0.038	ND	U		0.047	ND	U		0.034	ND	U		0.034	ND	U		0.041	ND	U		0.038	ND	U		0.036	ND	U		0.042	ND	U		0.040
MAK104O	1/13/2014	0.074			0.033	0.150			0.033	ND	U		0.041	ND	U		0.041	ND	U		0.049	ND	U		0.043	ND	U		0.046	ND	U		0.049	ND	U		0.049	ND	U		0.039	ND	U		0.036	ND	U		0.034	ND	U		0.041	ND	U		0.038
MAK105O	1/13/2014	0.075			0.039	0.075			0.039	ND	U		0.034	ND	U		0.034	ND	U		0.052	ND	U		0.035	ND	U		0.043	ND	U		0.043	ND	U		0.043	ND	U		0.040	ND	U		0.034	ND	U		0.036	ND	U		0.050	ND	U		0.040
MAK106O	1/13/2014	0.067	JZ	J	0.032	0.043			0.032	ND	U		0.031	ND	U		0.031	ND	U		0.042	ND	U		0.032	ND	U		0.037	ND	U		0.038	ND	U		0.038	ND	U		0.037	ND	U		0.028	ND	U		0.030	ND	U		0.040	ND	U		0.034
MAK107O	1/13/2014	ND	U		0.051	0.072			0.051	ND	U		0.049	ND	U		0.049	ND	U		0.062	ND	U		0.049	ND	U		0.056	ND	U		0.045	ND	U		0.045	ND	U		0.053	ND	U		0.042	ND	U		0.039	ND	U		0.060	ND	U		0.049
MAK108O	1/13/2014	ND	U		0.037	0.100			0.037	ND	U		0.029	ND	U		0.029	ND	U		0.052	ND	U		0.033	ND	U		0.042	ND	U		0.044	ND	U		0.044	ND	U		0.031	ND	U		0.025	ND	U		0.029	ND	U		0.036	ND	U		0.030
Sea Cucumber (Loli)																																																												
Dry Season																																																												
MAK001C	9/9/2013	ND	BJZ	U	0.099	ND	U		0.099	ND	U		0.190	**0.91**			0.190	ND	U		0.140	ND	U		0.082	ND	U		0.110	ND	U		0.200	ND	U		0.200	ND	U		0.120	ND	U		0.110	ND	U		0.099	ND	U		0.160	ND	U		0.120
MAK002C	9/9/2013	ND	BJZ	U	0.063	ND	U		0.063	ND	U		0.084	ND	U		0.084	ND	U		0.072	ND	U		0.052	ND	U		0.062	ND	U		0.064	ND	U		0.064	ND	U		0.047	ND	U		0.049	ND	U		0.049	ND	U		0.065	ND	U		0.052
MAK004C	9/9/2013	ND	BJZ	U	0.057	ND	U		0.057	ND	U		0.095	**0.360**			0.095	ND	U		0.063	ND	U		0.040	ND	U		0.051	ND	U		0.067	ND	U		0.067	ND	U		0.041	ND	U		0.036	ND	U		0.038	ND	U		0.055	ND	U		0.043
MAK005C	9/9/2013	ND	U		0.069	ND	U		0.069	ND	U		0.120	0.25			0.120	ND	U		0.073	ND	U		0.049	ND	U		0.061	ND	U		0.060	ND	U		0.060	ND	U		0.050	ND	U		0.047	ND	U		0.036	ND	U		0.057	ND	U		0.047
MAK006C	9/11/2013	ND	BJZ	U	0.058	ND	U		0.058	ND	U		0.065	**0.65**			0.065	ND	U		0.059	ND	U		0.046	ND	U		0.053	ND	U		0.079	0.12			0.079	ND	U		0.050	ND	U		0.051	ND	U		0.042	ND	U		0.056	ND	U		0.050
MAK007C	9/11/2013	ND	U		0.081	ND	U		0.081	ND	U		0.100	**0.88**			0.100	ND	U		0.064	ND	U		0.045	ND	U		0.054	ND	U		0.078	ND	U		0.078	ND	U		0.053	ND	U		0.044	ND	U		0.048	ND	U		0.064	ND	U		0.052
MAK008C	9/11/2013	ND	BJZ	U	0.068	ND	U		0.068	ND	U		0.100	**0.53**			0.100	ND	U		0.064	ND	U		0.040	ND	U		0.052	ND	U		0.075	ND	U		0.075	ND	U		0.054	ND	U		0.052	ND	U		0.050	ND	U		0.064	ND	U		0.055
MAK009C	9/11/2013	ND		U	0.050	0.100		J	0.050	ND	U		0.069	ND	U		0.069	ND	U		0.043	ND	U		0.031	ND	U		0.037	ND	U		0.058	ND	U		0.058	ND	U		0.048	ND	U		0.046	ND	U		0.038	ND	U		0.063	ND	U		0.049
Wet Season																																																												
MAK102C	1/13/2014	ND	BJZ	U	0.053	0.093		J	0.053	ND	U		0.045	ND	U		0.045	ND	U		0.025	ND	U		0.016	ND	U		0.021	ND	U		0.023	ND	U		0.023	ND	U		0.034	ND	U		0.028	ND	U		0.033	ND	U		0.048	ND	U		0.036
MAK103C	1/13/2014	ND		U	0.046	0.140		J	0.046	ND	U		0.036	ND	U		0.036	ND	U		0.023	0.022	JZ		0.019	ND	U		0.021	ND	U		0.020	ND	U		0.020	ND	U		0.028	ND	U		0.024	ND	U		0.028	ND	U		0.038	ND	U		0.030
MAK104C	1/13/2014	ND		U	0.051	0.11		J	0.051	ND	U		0.060	ND	U		0.060	ND	U		0.024	ND	U		0.020	ND	U		0.022	ND	U		0.027	ND	U		0.027	ND	U		0.021	ND	U		0.016	ND	U		0.018	ND	U		0.027	ND	U		0.020
MAK105C	1/13/2014	ND	BJZ	U	0.047	0.062		J	0.047	ND	U		0.039	ND	U		0.039	ND	U		0.022	ND	U		0.015	ND	U		0.018	ND	U		0.017	ND	U		0.017	ND	U		0.022	ND	U		0.018	ND	U		0.017	ND	U		0.027	ND	U		0.021
MAK106C	1/13/2014	ND		U	0.046	0.140		J	0.046	ND	U		0.034	ND	U		0.034	ND	U		0.026	ND	U		0.019	ND	U		0.022	ND	U		0.023	ND	U		0.023	ND	U		0.022	ND	U		0.017	ND	U		0.018	ND	U		0.029	ND	U		0.021
MAK107C	1/13/2014	ND	BJZ	U	0.050	ND	U		0.050	ND	U		0.058	ND	U		0.058	ND	U		0.022	ND	U		0.016	ND	U		0.019	ND	U		0.016	ND	U		0.016	ND	U		0.024	ND	U		0.021	ND	U		0.020	ND	U		0.035	ND	U		0.025
MAK108C	1/13/2014	ND	BJZ	U	0.048	0.062		J	0.048	ND	U		0.048	ND	U		0.048	ND	U		0.042	0.038			0.033	0.038			0.037	ND	U		0.043	ND	U		0.043	0.049			0.030	ND	U		0.028	0.061			0.024	ND	U		0.033	0.110			0.029
MAK110C	1/14/2014	ND	BJZ	U	0.043	ND	U		0.043	ND	U		0.038	ND	U		0.038	ND	U		0.051	ND	U		0.040	ND	U		0.046	ND	U		0.038	ND	U		0.038	0.033	JZ		0.031	ND	U		0.021	0.030	JZ		0.021	0.038	JZ		0.027	ND	U		0.025
Seaweed (Limu kohu)																																																												
Dry Season																																																												
MAK001L/2L/26L	9/9/2013; 9/10/2013; 9/27/2013	0.089			0.064	0.210			0.064	ND	U		0.048	**0.590**			0.048	ND	U		0.050	ND	U		0.047	ND	U		0.049	0.046			0.045	0.150			0.045	ND		U	0.032	0.057			0.028	ND	BJZ	U	0.031	ND	U		0.042	0.092		J	0.033
MAK013L	9/18/2013	0.090			0.072	0.220			0.072	ND	U		0.067	**0.730**			0.067	ND	U		0.059	ND	U		0.047	ND	U		0.053	ND	U		0.047	ND	U		0.047	ND	U		0.040	ND	U		0.035	ND	U		0.038	ND	U		0.044	ND	U		0.039
MAK016L/21L/27L	9/23/2013; 9/27/2013; 9/27/2013	ND	U		0.130	0.500			0.130	ND	U		0.120	**1.00**			0.120	ND	U		0.072	ND	U		0.074	ND	U		0.073	ND	U		0.053	0.220			0.053	ND	U		0.037	ND	U		0.042	ND	U		0.049	ND	U		0.055	ND	U		0.046
MAK022L	9/27/2013	0.100			0.082	0.100			0.082	ND	U		0.063	**0.530**			0.063	ND	U		0.057	ND	U		0.050	ND	U		0.054	ND	U		0.037	ND	U		0.037	ND	U		0.038	ND	U		0.032	ND	U		0.033	ND	U		0.038	ND	U		0.035
MAK023L	9/27/2013	ND	U		0.150	ND	U		0.150	ND	U		0.088	**0.400**			0.088	ND	U		0.062	ND	U		0.045	ND	U		0.054	ND	U		0.041	ND	U		0.041	ND	U		0.041	ND	U		0.039	ND	U		0.040	ND	U		0.048	ND	U		0.042
MAK024L/25L	9/27/2013; 9/27/2013	ND	U		0.086	ND	U		0.086	ND	U		0.064	ND	U		0.064	ND	U		0.046	ND	U		0.046	ND	U		0.046	ND	U		0.045	0.061			0.045	ND	U		0.064	ND	U		0.057	ND	U		0.054	ND	U		0.076	0.390			0.063
MAK025L	9/27/2013	ND	U		0.110	ND	U		0.110	ND	U		0.054	**0.420**			0.054	ND	U		0.057	ND	U		0.045	ND	U		0.051	ND	U		0.035	ND	U		0.035	ND	U		0.048	ND	U		0.031	ND		U	0.038	ND	U		0.046	0.043		J	0.041
MAK029L	10/11/2013	0.120	JZ		0.081	0.170			0.081	ND	U		0.076	**0.610**			0.076	ND	U		0.051	ND	U		0.058	ND	U		0.055	ND	U		0.054	0.080			0.054	ND	JZ	U	0.032	0.050			0.025	ND	BJZ	U	0.030	ND		U	0.041	0.095		J	0.032
Wet Season																																																												
MAK101L	1/13/2014	ND	U		0.061	0.380			0.061	ND	U		0.039	ND	U		0.039	ND	U		0.038	ND	U		0.032	ND	U		0.035	ND	U		0.026	ND	U		0.026	0.023	JZ		0.017	ND	U		0.016	0.019	JZ		0.017	0.024			0.023	0.024			0.018
MAK102L	1/13/2014	ND	BJZ	U	0.056	ND	U		0.056	ND	U		0.037	ND	U		0.037	ND	U		0.044	ND	U		0.034	ND	U		0.039	ND	U		0.030	ND	U		0.030	ND	U		0.028	ND	U		0.026	ND	U		0.027	ND	U		0.029	ND	U		0.028
MAK105L	1/13/2014	ND	U		0.094	ND	U		0.094	ND	U		0.053	ND	U		0.053	ND	U		0.060	ND	U		0.043	ND	U		0.051	ND	U		0.042	ND	U		0.042	ND	U		0.029	0.029			0.025	ND	U		0.022	ND	U		0.028	0.029			0.026
MAK106L	1/14/2014	ND	U		0.086	ND	U		0.086	ND	U		0.064	ND	U		0.064	ND	U		0.053	ND	U		0.036	ND	U		0.045	ND	U		0.027	ND	U		0.027	ND	U		0.023	0.023			0.019	ND	U		0.018	ND	U		0.025	0.023			0.021
MAK108,109,110,113L	1/14/2014; 1/14/2014; 1/14/2014; 1/14/2014	ND	U		0.130	ND	U		0.130	ND	U		0.056	ND	U		0.056	ND	U		0.047	ND	U		0.035	0.100			0.041	ND	U		0.053	ND	U		0.053	ND	U		0.034	ND	U		0.030	ND	U		0.030	ND	U		0.037	ND	U		0.033
MAK111L	1/14/2014	ND	U		0.140	ND	U		0.140	ND	U		0.057	ND	U		0.057	ND	U		0.069	ND	U		0.048	ND	U		0.058	ND	U		0.041	ND	U		0.041	ND	U		0.031	ND	U		0.024	ND	U		0.021	ND	U		0.028	ND	U		0.026
MAK112L	1/14/2014	ND	U		0.130	ND	U		0.130	ND	U		0.055	ND	U		0.055	ND	U		0.047	ND	U		0.037	0.067			0.042	ND	U		0.036	ND	U		0.036	ND	U		0.044	ND	U		0.043	ND	U		0.034	ND	U		0.040	ND	U		0.040
MAK115L	1/14/2014	ND	U		0.075	ND	U		0.075	ND	U		0.082	ND	U		0.082	ND	U		0.062	ND	U		0.056	0.160			0.059	ND	U		0.052	ND	U		0.052	ND	U		0.032	ND	U		0.036	ND	U		0.035	ND	U		0.046	ND	U		0.037

Draft

Table F-5a: Concentrations of Dioxins/Dibenzofurans in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		2,3,7,8-TCDF				Total TCDF				2,3,7,8-TCDD				Total TCDD				1,2,3,7,8-PeCDF				2,3,4,7,8-PeCDF				Total PeCDF				1,2,3,7,8-PeCDD				Total PeCDD				1,2,3,4,7,8-HxCDF				1,2,3,6,7,8-HxCDF				2,3,4,6,7,8-HxCDF				1,2,3,7,8,9-HxCDF				Total HxCDF			
CAS Number		51207-31-9				30402-14-3				01746-01-6				41903-57-5				57117-41-6				57117-31-4				30402-15-4				40321-76-4				36088-22-9				70648-26-9				57117-44-9				60851-34-5				72918-21-9				55684-94-1			
Project Screening Values[1]		3.08				3.08				0.308				0.308				1.03				1.03				1.03				0.308				0.308				3.08				3.08				3.08				3.08				3.08			
Units		ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet			
Lab ID	Collection Date	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]
Mokulēʻia																																																										
Octopus (Heʻe)																																																										
Dry Season																																																										
MAK009O	9/13/2013	ND	JZ	UJ	0.033	ND	U		0.033	ND	U		0.043	0.130			0.043	ND	U		0.057	ND	U		0.046	ND	U		0.051	ND	U		0.061	ND	U		0.061	ND	U		0.038	ND	U		0.032	ND		U	0.036	ND	U		0.036	0.048			0.036
MAK010O	9/16/2013	ND	JZ	UJ	0.043	0.052			0.043	ND	U		0.069	0.140			0.069	ND	U		0.087	ND	U		0.058	ND	U		0.072	ND	U		0.110	ND	U		0.110	ND		U	0.065	ND	U		0.060	ND	U		0.059	ND	U		0.070	0.067			0.063
MAK011O	9/16/2013	ND	JZ	U	0.040	0.057			0.040	ND	U		0.053	ND	U		0.053	ND	U		0.059	ND	U		0.048	ND	U		0.053	ND	U		0.060	ND	U		0.060	ND	U		0.056	ND	U		0.057	ND	U		0.048	ND	U		0.072	ND	U		0.058
MAK015O	9/22/2013	ND	JZ	U	0.029	0.052			0.029	ND	U		0.041	0.220			0.041	ND	U		0.041	ND	U		0.030	ND	U		0.036	ND	U		0.038	ND	U		0.038	ND	U		0.021	ND	U		0.026	ND	U		0.026	ND	U		0.028	ND	U		0.025
MAK016O	9/22/2013	ND	JZ	U	0.030	0.062			0.030	ND	U		0.057	ND	U		0.057	ND	U		0.058	ND	U		0.048	ND	U		0.053	ND	U		0.055	ND	U		0.055	ND	JZ	U	0.030	ND		U	0.030	ND		U	0.024	ND		U	0.030	0.140			0.029
MAK017O	9/22/2013	ND	JZ	U	0.040	0.073			0.040	ND	U		0.043	ND	U		0.043	ND	U		0.052	ND	U		0.044	0.061			0.048	ND	U		0.053	ND	U		0.053	ND	U		0.047	ND	U		0.046	ND	U		0.041	ND	U		0.045	ND	U		0.045
MAK018O	9/22/2013	ND	JZ	UJ	0.038	ND	U		0.038	ND	U		0.049	0.160			0.049	ND	U		0.063	ND	U		0.041	ND	U		0.052	ND	U		0.052	ND	U		0.052	ND	U		0.038	ND	U		0.035	ND	U		0.035	ND	U		0.053	ND	U		0.040
MAK024O	9/27/2013	ND	JZ	U	0.099	0.14			0.099	ND	U		0.140	**0.59**			0.140	ND	U		0.140	ND	U		0.089	ND	U		0.120	ND	U		0.140	ND	U		0.140	ND	U		0.100	ND	U		0.087	ND	U		0.094	ND	U		0.091	ND	U		0.093
Wet Season																																																										
MAK109O	1/31/2014	ND	JZ	U	0.100	ND	U		0.100	ND	U		0.092	ND	U		0.092	ND	U		0.080	ND	U		0.059	ND	U		0.069	ND	U		0.078	ND	U		0.078	ND	U		0.057	ND	U		0.070	ND	U		0.079	ND	U		0.088	ND	U		0.073
MAK118O	3/27/2014	ND	JZ	U	0.064	0.11		J	0.064	ND	U		0.065	0.16			0.065	ND	U		0.055	ND	U		0.042	ND	U		0.049	ND	U		0.084	ND	U		0.084	ND	U		0.080	ND	U		0.065	ND	U		0.076	ND	U		0.088	ND	U		0.077
MAK119O	3/27/2014	ND	JZ	UJ	0.100	ND	U		0.100	ND	U		0.140	ND	U		0.140	ND	U		0.130	ND	U		0.150	ND	U		0.140	ND	U		0.230	ND	U		0.230	ND	U		0.130	ND	U		0.110	ND	U		0.100	0.16			0.140	0.16			0.120
MAK120O	3/27/2014	ND	U		0.120	ND	U		0.120	ND	U		0.110	0.20			0.110	ND	U		0.130	ND	U		0.170	ND	U		0.150	ND	U		0.200	ND	U		0.200	ND	U		0.100	ND	U		0.091	ND	U		0.081	0.11	JZ		0.100	ND	U		0.095
MAK121O	3/27/2014	ND	JZ	U	0.10	ND	U		0.10	ND	U		0.14	ND	U		0.14	ND	U		0.13	ND	U		0.19	ND	U		0.16	ND	U		0.21	ND	U		0.21	ND	U		0.12	ND	U		0.11	ND	U		0.10	0.13	JZ		0.12	ND	U		0.11
MAK122O	3/27/2014	ND	JZ	U	0.100	ND	U		0.100	ND	U		0.110	ND	U		0.110	ND	U		0.110	ND	U		0.140	ND	U		0.130	ND	U		0.180	ND	U		0.180	ND	U		0.130	ND	U		0.098	ND	U		0.100	ND	U		0.130	ND	U		0.110
MAK123O	3/27/2014	ND	JZ	UJ	0.095	ND	U		0.095	ND	U		0.160	0.17			0.160	ND	U		0.170	ND	U		0.170	ND	U		0.170	ND	U		0.190	ND	U		0.190	ND	U		0.110	ND	U		0.089	ND	U		0.088	ND	U		0.110	ND	U		0.099
MAK124O	3/28/2014	ND	JZ	U	0.089	0.10		J	0.089	ND	U		0.130	ND	U		0.130	ND	U		0.170	ND	U		0.170	ND	U		0.170	ND	U		0.260	ND	U		0.260	ND	U		0.130	ND	U		0.110	ND	U		0.093	ND	U		0.130	ND	U		0.120
Sea Cucumber (Loli)																																																										
Dry Season																																																										
MAK010C	9/13/2013	ND	U		0.16	ND	U		0.16	ND	U		0.16	ND	U		0.16	ND	U		0.15	ND	U		0.13	ND	U		0.14	ND	U		0.18	ND	U		0.18	ND	U		0.14	ND	U		0.11	ND	U		0.10	ND	U		0.18	ND	U		0.13
MAK014C	9/13/2013	ND	U		0.16	ND	U		0.16	ND	U		0.15	**1.40**			0.15	ND	U		0.19	ND	U		0.12	ND	U		0.16	ND	U		0.18	ND	U		0.18	ND	U		0.15	ND	U		0.13	ND	U		0.14	ND	U		0.19	ND	U		0.15
MAK020C	9/16/2013	0.12	JZ	J	0.064	0.320			0.064	ND	U		0.059	**1.100**			0.059	ND	U		0.082	ND	U		0.060	0.230			0.071	ND	U		0.058	0.110			0.058	ND	U		0.047	ND	U		0.045	ND	U		0.046	ND	U		0.068	0.074			0.051
MAK022C	9/16/2013	0.092	JZ		0.059	ND	U		0.059	ND	U		0.064	**1.40**			0.064	ND	U		0.077	ND	U		0.055	ND	U		0.066	ND	U		0.064	0.13			0.064	ND	U		0.045	ND	U		0.036	ND	U		0.040	ND	U		0.051	ND	U		0.043
MAK024C	9/22/2013	0.072	JZ		0.054	ND	U		0.054	ND	U		0.063	**0.840**			0.063	ND	U		0.042	ND	U		0.035	ND	U		0.038	ND	U		0.042	0.096			0.042	ND	U		0.041	ND	U		0.032	ND	U		0.033	ND	U		0.039	ND	U		0.037
MAK025C	9/22/2013	0.061	JZ		0.039	0.042			0.039	ND	U		0.064	**0.580**			0.064	ND	U		0.050	ND	U		0.036	ND	U		0.043	ND	U		0.046	0.083			0.046	ND	U		0.040	ND	U		0.038	ND	U		0.037	ND	U		0.050	ND	U		0.042
MAK026C	9/22/2013	0.077			0.044	0.120			0.044	ND	U		0.061	**0.490**			0.061	ND	U		0.058	ND	U		0.051	ND	U		0.055	ND	U		0.045	0.10			0.045	ND	U		0.037	ND	U		0.037	ND	U		0.039	ND	U		0.048	ND	U		0.040
MAK027C	9/22/2013	0.075			0.043	0.075			0.043	ND	U		0.057	**0.650**			0.057	ND	U		0.052	ND	U		0.037	ND	U		0.045	ND	U		0.045	0.055			0.045	ND	U		0.044	ND	U		0.035	ND	U		0.040	ND	U		0.046	ND	U		0.041
Wet Season																																																										
MAK111C	1/31/2014	ND		U	0.046	0.6000		J	0.046	ND	U		0.051	ND	U		0.051	ND	U		0.061	ND	U		0.040	ND	U		0.051	ND	U		0.060	ND	U		0.060	ND	U		0.048	ND	U		0.038	ND	U		0.040	ND	U		0.052	ND	U		0.045
MAK113C	1/31/2014	ND		U	0.028	0.540		J	0.028	ND	U		0.042	0.120			0.042	ND	U		0.041	ND	U		0.031	ND	U		0.036	ND	U		0.045	ND	U		0.045	ND	U		0.040	ND	U		0.034	ND	U		0.037	ND	U		0.043	ND	U		0.038
MAK114C	1/31/2014	ND		U	0.044	0.580		J	0.044	ND	U		0.048	ND	U		0.048	ND	U		0.045	ND	U		0.036	ND	U		0.040	ND	U		0.071	ND	U		0.071	ND	U		0.042	ND	U		0.037	ND	U		0.039	ND	U		0.048	ND	U		0.041
MAK115C	1/31/2014	ND	BJZ	U	0.042	0.480		J	0.042	ND	U		0.053	0.130			0.053	ND	U		0.047	ND	U		0.039	ND	U		0.043	ND	U		0.064	ND	U		0.064	ND	U		0.033	ND	U		0.026	ND	U		0.030	ND	U		0.041	ND	U		0.032
MAK116C	1/31/2014	ND		U	0.051	0.690		J	0.051	ND	U		0.065	ND	U		0.065	ND	U		0.053	ND	U		0.042	ND	U		0.048	ND	U		0.054	ND	U		0.054	ND	U		0.049	ND	U		0.040	ND	U		0.040	ND	U		0.062	ND	U		0.048
MAK117C	1/31/2014	ND	BJZ	U	0.042	0.059		J	0.042	ND	U		0.057	0.087			0.057	ND	U		0.066	ND	U		0.046	ND	U		0.056	ND	U		0.053	ND	U		0.053	ND	U		0.044	ND	U		0.043	ND	U		0.037	ND	U		0.059	ND	U		0.046
MAK118C	1/31/2014	ND	BJZ	U	0.040	0.580		J	0.040	ND	U		0.034	ND	U		0.034	ND	U		0.047	ND	U		0.035	ND	U		0.041	ND	U		0.045	ND	U		0.045	ND	U		0.032	ND	U		0.035	ND	U		0.037	ND	U		0.047	ND	U		0.038
MAK120C	2/11/2014	ND		U	0.051	0.210		J	0.051	ND	U		0.047	0.100			0.047	ND	U		0.054	ND	U		0.039	ND	U		0.046	ND	U		0.042	ND	U		0.042	ND	U		0.047	ND	U		0.045	ND	U		0.046	ND	U		0.053	ND	U		0.048
Seaweed (Limu kohu)																																																										
Dry Season																																																										
MAK007L	9/16/2013	0.074	JZ		0.073	ND	U		0.073	ND	U		0.078	**0.630**			0.078	ND	U		0.067	ND	JZ	U	0.044	ND	U		0.055	ND	U		0.051	0.220			0.051	ND	JZ	U	0.034	0.058			0.032	ND	BJZ	U	0.029	ND	U		0.035	0.058		J	0.033
MAK009L	9/16/2013	ND	U		0.120	ND	U		0.120	ND	U		0.088	**0.580**			0.088	ND	U		0.069	ND	U		0.055	ND	U		0.062	ND	U		0.046	0.079			0.046	ND		U	0.042	ND	U		0.038	ND	U		0.039	ND	BJZ	U	0.044	0.050		J	0.041
MAK010L (comp)	9/16/2013	ND	U		0.084	ND	U		0.084	ND	U		0.079	**0.64**			0.079	ND	U		0.050	ND	U		0.048	ND	U		0.049	ND	U		0.043	0.13			0.043	ND	JZ	U	0.041	ND	U		0.037	ND	U		0.042	ND	U		0.045	ND	U		0.041
MAK044L	10/15/2013	0.13			0.095	0.28			0.095	ND	U		0.080	**0.74**			0.080	ND	U		0.072	ND	U		0.057	ND	U		0.065	ND	U		0.068	0.22			0.068	ND	U		0.048	ND	U		0.049	ND	U		0.050	ND	U		0.058	ND	U		0.051
MAK045L	10/15/2013	ND	U		0.120	ND	U		0.120	ND	U		0.100	**0.790**			0.100	ND	U		0.091	ND	U		0.059	ND	U		0.075	ND	U		0.067	ND	U		0.067	ND	U		0.057	ND	U		0.052	ND	U		0.060	ND	U		0.064	ND	U		0.058
MAK046L	10/15/2013	ND	U		0.120	0.140			0.120	ND	U		0.100	**0.780**			0.100	ND	U		0.098	ND	U		0.072	ND	U		0.085	ND	U		0.063	0.100			0.063	ND	U		0.061	ND	U		0.062	ND	U		0.057	ND	U		0.055	ND	U		0.058
MAK047L	10/15/2013	0.120			0.068	0.120			0.068	ND	U		0.056	**0.960**			0.056	ND	U		0.053	ND	U		0.038	ND	U		0.046	ND	U		0.046	0.064			0.046	ND	U		0.040	ND	U		0.038	ND	U		0.040	ND	U		0.040	ND	U		0.040
MAK049L	10/15/2013	ND	U		0.110	ND	U		0.110	ND	U		0.062	**0.38**			0.062	ND	U		0.074	ND	U		0.048	ND	U		0.061	ND	U		0.044	ND	U		0.044	ND	U		0.066	ND	U		0.059	ND	U		0.055	ND	U		0.066	ND	U		0.061
Wet Season																																																										
MAK120L	1/31/2014	ND	BJZ	UJ	0.074	ND	U		0.074	ND	U		0.079	ND	U		0.079	ND	U		0.079	ND	U		0.055	ND	U		0.067	ND	U		0.094	ND	U		0.094	ND	U		0.056	ND	U		0.042	ND	U		0.044	ND	U		0.054	0.11			0.049
MAK121L	1/31/2014	ND	U		0.110	0.27			0.110	ND	U		0.058	0.14			0.058	ND	U		0.081	ND	U		0.068	0.21			0.074	ND	U		0.096	ND	U		0.096	ND	U		0.049	ND	U		0.054	ND	U		0.056	ND	U		0.070	ND	U		0.057
MAK122L	1/31/2014	ND	BJZ	UJ	0.080	ND	U		0.080	ND	U		0.074	0.17			0.074	ND	U		0.055	ND	U		0.050	ND	U		0.052	ND	U		0.067	ND	U		0.067	ND	U		0.047	ND	U		0.035	ND	U		0.042	ND	U		0.055	ND	U		0.045
MAK123L	1/31/2014	ND	U		0.056	0.26			0.056	ND	U		0.056	ND	U		0.056	ND	U		0.048	ND	U		0.041	ND	U		0.045	ND	U		0.056	ND	U		0.056	ND	U		0.034	ND	U		0.029	ND	U		0.029	ND	U		0.038	ND	U		0.033
MAK124L	1/31/2014	ND	U		0.087	ND	U		0.087	ND	U		0.048	0.13			0.048	ND	U		0.049	ND	U		0.048	ND	U		0.048	ND	U		0.050	ND	U		0.050	ND	U		0.033	ND	U		0.034	ND	U		0.038	ND	U		0.041	0.10			0.037
MAK126L	1/31/2014	ND	U		0.072	0.35			0.072	ND	U		0.072	0.11			0.072	ND	U		0.069	ND	U		0.053	ND	U		0.061	ND	U		0.064	ND	U		0.064	ND	U		0.050	ND	U		0.045	ND	U		0.044	ND	U		0.059	0.10			0.050
MAK127L	2/11/2014	ND	BJZ	U	0.045	ND	U		0.045	ND	U		0.028	0.210			0.028	ND	U		0.023	ND	BJZ	U	0.017	ND	U		0.020	ND	U		0.021	ND	U		0.021	ND	U		0.024	ND	U		0.023	ND	U		0.020	ND	U		0.030	ND	U		0.024
MAK128L	2/11/2014	ND	BJZ	U	0.041	ND	U		0.041	ND	U		0.020	0.130			0.020	ND	U		0.022	ND	U		0.014	ND	U		0.018	ND	U		0.017	ND	U		0.017	ND	U		0.020	ND	U		0.017	ND	U		0.015	ND	U		0.019	ND	U		0.018

Draft

Table F-5a: Concentrations of Dioxins/Dibenzofurans in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		2,3,7,8-TCDF				Total TCDF				2,3,7,8-TCDD				Total TCDD				1,2,3,7,8-PeCDF				2,3,4,7,8-PeCDF				Total PeCDF				1,2,3,7,8-PeCDD				Total PeCDD				1,2,3,4,7,8-HxCDF				1,2,3,6,7,8-HxCDF				2,3,4,6,7,8-HxCDF				1,2,3,7,8,9-HxCDF				Total HxCDF			
CAS Number		51207-31-9				30402-14-3				01746-01-6				41903-57-5				57117-41-6				57117-31-4				30402-15-4				40321-76-4				36088-22-9				70648-26-9				57117-44-9				60851-34-5				72918-21-9				55684-94-1			
Project Screening Values[1]		3.08				3.08				0.308				0.308				1.03				1.03				1.03				0.308				0.308				3.08				3.08				3.08				3.08				3.08			
Units		ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet			
Lab ID	Collection Date	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]
Kaʻena Point																																																										
Octopus (Heʻe)																																																										
Dry Season																																																										
MAK012O	9/22/2013	ND	JZ	UJ	0.039	0.052			0.039	ND	U		0.055	**0.380**			0.055	ND	U		0.054	ND	U		0.039	ND	U		0.047	ND	U		0.043	0.046			0.043	ND	JZ	U	0.034	ND	U		0.033	ND	U		0.028	ND	U		0.042	0.036	JZ		0.034
MAK013O	9/22/2013	ND	JZ	UJ	0.041	0.065			0.041	ND	U		0.060	ND	U		0.060	ND	U		0.067	ND	U		0.043	ND	U		0.055	ND	U		0.062	ND	U		0.062	ND	U		0.045	ND	U		0.040	ND	U		0.040	ND	U		0.048	ND	U		0.043
MAK014O	9/23/2013	ND	JZ	U	0.036	ND	U		0.036	ND	U		0.046	**0.310**			0.046	ND	U		0.060	ND	U		0.045	ND	U		0.053	ND	U		0.045	ND	U		0.045	ND	U		0.031	ND	U		0.025	ND	U		0.030	ND	U		0.034	ND	U		0.030
MAK019O	9/23/2013	ND		U	0.029	0.180			0.029	ND	U		0.058	ND	U		0.058	ND	U		0.052	ND	U		0.046	ND	U		0.049	ND	U		0.054	ND	U		0.054	ND	U		0.042	ND	U		0.037	ND	U		0.040	ND	U		0.044	ND	U		0.040
MAK020O	9/23/2013	ND	JZ	UJ	0.041	0.065			0.041	ND	U		0.059	**0.460**			0.059	ND	U		0.056	ND	U		0.040	ND	U		0.048	ND	U		0.071	ND	U		0.071	ND	U		0.035	ND	U		0.040	ND	U		0.035	ND	U		0.034	ND	U		0.036
MAK021O	9/23/2013	ND	JZ	UJ	0.041	0.042			0.041	ND	U		0.052	0.120			0.052	ND	U		0.053	ND	U		0.046	ND	U		0.049	ND	U		0.057	ND	U		0.057	ND	U		0.038	ND	U		0.040	ND	U		0.037	ND	U		0.045	ND	U		0.040
MAK022O	9/23/2013	ND	JZ	UJ	0.031	ND	U		0.031	ND	U		0.058	**0.390**			0.058	ND	U		0.048	ND	U		0.041	ND	U		0.045	ND	U		0.073	ND	U		0.073	ND	U		0.037	ND	U		0.034	ND	U		0.038	ND	U		0.039	ND	U		0.037
MAK023O	9/23/2013	ND	JZ	U	0.040	0.060			0.040	ND	U		0.076	**0.440**			0.076	ND	U		0.059	ND	U		0.050	ND	U		0.055	ND	U		0.059	ND	U		0.059	ND	U		0.041	ND	U		0.044	ND	U		0.044	ND	U		0.054	ND	U		0.046
Wet Season																																																										
MAK110O	3/28/2014	ND		U	0.092	0.14		J	0.092	ND	U		0.096	ND	U		0.096	ND	U		0.081	ND	U		0.069	ND	U		0.075	ND	U		0.110	ND	U		0.110	ND	U		0.067	ND	U		0.058	ND	U		0.061	ND	U		0.087	ND	U		0.068
MAK111O	3/28/2014	ND		U	0.085	0.12		J	0.085	ND	U		0.110	0.23			0.110	ND	U		0.075	ND	U		0.062	ND	U		0.068	ND	U		0.160	ND	U		0.160	ND	U		0.097	ND	U		0.070	ND	U		0.071	ND	U		0.085	ND	U		0.081
MAK112O	3/28/2014	ND	U		0.120	ND	U		0.120	ND	U		0.099	ND	U		0.099	ND	U		0.081	ND	U		0.067	ND	U		0.074	ND	U		0.140	ND	U		0.140	ND	U		0.089	ND	U		0.073	ND	U		0.083	ND	U		0.120	ND	U		0.090
MAK113O	3/28/2014	ND		U	0.092	0.14		J	0.092	ND	U		0.076	0.27			0.076	ND	U		0.056	ND	U		0.061	ND	U		0.059	ND	U		0.120	ND	U		0.120	ND	U		0.075	ND	U		0.100	ND	U		0.085	ND	U		0.084	ND	U		0.086
MAK114O	3/28/2014	ND	JZ	U	0.100	ND	U		0.100	ND	U		0.082	**0.48**			0.082	ND	U		0.070	ND	U		0.042	ND	U		0.056	ND	U		0.110	ND	U		0.110	ND	U		0.057	ND	U		0.074	ND	U		0.054	ND	U		0.085	ND	U		0.068
MAK115O	3/28/2014	ND	U		0.110	ND	U		0.110	ND	U		0.087	0.230			0.087	ND	U		0.064	ND	U		0.057	ND	U		0.061	ND	U		0.120	ND	U		0.120	ND	U		0.085	ND	U		0.075	ND	U		0.074	ND	U		0.100	ND	U		0.084
MAK116O	3/28/2014	ND		U	0.065	0.19		J	0.065	ND	U		0.072	ND	U		0.072	ND	U		0.065	ND	U		0.057	ND	U		0.061	ND	U		0.100	ND	U		0.100	ND	U		0.060	ND	U		0.080	ND	U		0.067	ND	U		0.099	ND	U		0.076
MAK117O	3/28/2014	ND	JZ	U	0.066	0.074		J	0.066	ND	U		0.048	0.200			0.048	ND	U		0.052	ND	U		0.046	ND	U		0.049	ND	U		0.120	ND	U		0.120	ND	U		0.036	ND	U		0.033	ND	U		0.030	ND	U		0.048	ND	U		0.037
Sea Cucumber (Loli)																																																										
Dry Season																																																										
MAK015C	9/13/2013	ND	U		0.19	ND	U		0.19	ND	U		0.23	**1.3**			0.23	ND	U		0.20	ND	U		0.14	ND	U		0.17	ND	U		0.19	ND	U		0.19	ND	U		0.18	ND	U		0.15	ND	U		0.13	ND	U		0.18	ND	U		0.16
MAK018C	9/16/2013	ND	U		0.130	ND	U		0.130	ND	U		0.140	**1.20**			0.140	ND	U		0.180	ND	U		0.130	ND	U		0.160	ND	U		0.100	ND	U		0.100	ND	U		0.096	ND	U		0.074	ND	U		0.087	ND	U		0.130	ND	U		0.096
MAK019C	9/16/2013	ND	U		0.120	0.33			0.120	ND	U		0.110	**0.96**			0.110	ND	U		0.150	ND	U		0.110	ND	U		0.130	ND	U		0.150	ND	U		0.150	ND	U		0.110	ND	U		0.093	ND	U		0.092	ND	U		0.150	ND	U		0.110
MAK028C	9/22/2013	0.086			0.043	0.150			0.043	ND	U		0.055	**0.980**			0.055	ND	U		0.057	ND	U		0.047	ND	U		0.052	ND	U		0.035	0.035			0.035	0.037	JZ		0.032	0.041			0.025	0.073			0.026	0.054	JZ		0.039	0.110			0.030
MAK029C	9/23/2013	0.066	JZ		0.033	0.058			0.033	ND	U		0.054	**0.990**			0.054	ND	U		0.052	ND	U		0.041	ND	U		0.046	ND	U		0.034	0.085			0.034	ND	U		0.030	ND	U		0.029	0.033			0.030	ND	U		0.034	0.033			0.031
MAK030C	9/23/2013	0.094			0.079	0.094			0.079	ND	U		0.160	ND	U		0.160	ND	U		0.064	ND	U		0.043	ND	U		0.054	ND	U		0.078	ND	U		0.078	ND	U		0.053	ND	U		0.051	ND	U		0.052	ND	U		0.087	ND	U		0.061
MAK031C	9/23/2013	0.058	JZ		0.042	0.057			0.042	ND	U		0.041	**0.91**			0.041	ND	U		0.048	ND	U		0.032	0.057			0.040	ND	U		0.032	0.180			0.032	ND	U		0.027	ND	U		0.024	0.037			0.028	ND	U		0.035	0.037			0.028
MAK032C	9/23/2013	0.084			0.045	0.150			0.045	ND	U		0.054	**1.200**			0.054	ND	U		0.046	ND	U		0.035	ND	U		0.041	ND	U		0.044	0.120			0.044	ND	U		0.034	ND	U		0.030	ND	U		0.035	ND	U		0.043	ND	U		0.036
Wet Season																																																										
MAK121C	3/28/2014	ND	JZ	U	0.069	ND	U		0.069	ND	U		0.050	ND	U		0.050	ND	U		0.031	ND	U		0.026	ND	U		0.029	ND	U		0.029	ND	U		0.029	ND	U		0.029	ND	U		0.021	ND	U		0.021	ND	U		0.028	ND	U		0.025
MAK122C	3/28/2014	ND		U	0.047	0.150		J	0.047	ND	U		0.046	0.150			0.046	ND	U		0.028	ND	U		0.024	ND	U		0.026	ND	U		0.030	ND	U		0.030	ND	U		0.021	ND	U		0.015	ND	U		0.017	ND	U		0.020	ND	U		0.018
MAK123C	3/28/2014	ND	JZ	U	0.060	0.11		J	0.060	ND	U		0.066	0.13			0.066	ND	U		0.050	ND	U		0.035	ND	U		0.043	ND	U		0.031	ND	U		0.031	ND	U		0.027	ND	U		0.024	ND	U		0.025	ND	U		0.038	ND	U		0.029
MAK124C	3/28/2014	ND	JZ	U	0.086	0.11		J	0.086	ND	U		0.066	ND	U		0.066	ND	U		0.050	ND	U		0.040	ND	U		0.045	ND	U		0.043	ND	U		0.043	ND	U		0.041	ND	U		0.029	ND	U		0.033	ND	U		0.032	ND	U		0.034
MAK125C	3/28/2014	ND	U		0.110	ND	U		0.110	ND	U		0.190	ND	U		0.190	ND	U		0.072	ND	U		0.061	ND	U		0.067	ND	U		0.064	ND	U		0.064	ND	U		0.058	ND	U		0.068	ND	U		0.059	ND	U		0.074	ND	U		0.065
MAK126C	3/28/2014	ND		U	0.087	0.13		J	0.087	ND	U		0.120	0.12			0.120	ND	U		0.088	ND	U		0.072	ND	U		0.080	ND	U		0.048	ND	U		0.048	ND	U		0.042	ND	U		0.036	ND	U		0.037	ND	U		0.046	ND	U		0.040
MAK127C	3/28/2014	ND	U		0.110	0.17			0.110	ND	U		0.120	0.18			0.120	ND	U		0.099	ND	U		0.085	ND	U		0.092	ND	U		0.052	ND	U		0.052	ND	U		0.048	ND	U		0.042	ND	U		0.055	ND	U		0.063	ND	U		0.052
MAK128C	3/28/2014	ND		U	0.076	0.15		J	0.076	ND	U		0.087	ND	U		0.087	ND	U		0.110	ND	U		0.085	ND	U		0.097	ND	U		0.045	ND	U		0.045	ND	U		0.046	ND	U		0.045	ND	U		0.046	ND	U		0.049	ND	U		0.047
Seaweed (Limu kohu)																																																										
Dry Season																																																										
MAK011L	9/16/2013	0.100	JZ		0.097	ND	U		0.097	ND	U		0.077	**0.650**			0.077	ND	U		0.067	ND	U		0.041	ND	U		0.054	ND	U		0.048	0.140			0.048	ND	U		0.038	ND	U		0.034	ND	U		0.033	ND	U		0.041	ND	U		0.037
MAK030L	10/11/2013	ND	U		0.081	ND	U		0.081	ND	U		0.069	**0.51**			0.069	ND	U		0.059	ND	U		0.036	ND	U		0.048	ND	U		0.046	0.10			0.046	ND	U		0.042	ND	U		0.042	ND	U		0.044	ND	BJZ	U	0.050	ND	U		0.044
MAK033L	10/11/2013	ND	U		0.120	ND	U		0.120	ND	U		0.081	**0.420**			0.081	ND	U		0.067	ND		U	0.038	0.100			0.052	ND	U		0.041	0.097			0.041	ND	U		0.042	ND	U		0.043	ND	U		0.043	ND	U		0.055	ND	U		0.046
MAK034L	10/11/2013	ND	U		0.088	ND	U		0.088	ND	U		0.078	**0.560**			0.078	ND	U		0.047	ND	U		0.041	0.081			0.044	ND	U		0.040	0.045			0.040	ND	U		0.057	ND	U		0.054	ND	U		0.048	ND	U		0.059	ND	U		0.054
MAK038L	10/11/2013	0.088			0.074	0.170			0.074	ND	U		0.088	**0.520**			0.088	ND	U		0.051	ND	U		0.049	ND	U		0.050	ND	U		0.050	0.087			0.050	ND	U		0.047	ND	U		0.052	ND	U		0.049	ND	U		0.065	ND	U		0.053
MAK041L	10/11/2013	0.130			0.099	1.400			0.099	ND	U		0.083	**0.590**			0.083	ND	U		0.065	ND	JZ	U	0.046	0.370			0.055	ND	U		0.056	ND	U		0.056	ND	U		0.044	ND	U		0.044	ND	U		0.042	ND	U		0.069	0.054			0.050
MAK042L	10/11/2013	0.11			0.100	0.11			0.100	ND	U		0.091	**0.38**			0.091	ND	U		0.068	ND	U		0.058	ND	U		0.063	ND	U		0.064	ND	U		0.064	ND	U		0.055	ND	U		0.056	ND	U		0.051	ND	U		0.074	ND	U		0.059
MAK043L	10/11/2013	ND	U		0.120	ND	U		0.120	ND	U		0.069	**0.43**			0.069	ND	U		0.060	ND	U		0.054	ND	U		0.057	ND	U		0.071	ND	U		0.071	ND	U		0.059	ND	U		0.051	ND	U		0.053	ND	U		0.073	ND	U		0.059
Wet Season																																																										
MAK116L	1/31/2014	ND		U	0.032	0.160		J	0.032	ND	U		0.030	ND	U		0.030	ND	U		0.024	ND	BJZ	U	0.016	ND	U		0.020	ND	U		0.014	ND	U		0.014	ND	U		0.013	ND	JZ	U	0.012	0.018	JZ		0.012	ND	U		0.012	ND	U		0.012
MAK117L	1/31/2014	ND		U	0.030	0.180		J	0.030	ND	U		0.024	0.130			0.024	ND	U		0.015	ND	U		0.011	ND	U		0.013	ND	U		0.014	ND	U		0.014	ND	U		0.012	ND	JZ	U	0.011	ND	U		0.010	ND	U		0.011	ND	U		0.011
MAK118L	1/31/2014	ND		U	0.0360	0.450		J	0.0360	ND	U		0.0300	0.160			0.0300	ND	U		0.0220	ND		U	0.0150	0.0190		J	0.0190	ND	U		0.0160	ND	U		0.0160	0.027	JZ		0.0110	ND	JZ	U	0.0110	ND	U		0.0097	ND	U		0.0140	ND	U		0.0110
MAK130L	3/27/2014	ND	JZ	U	0.140	ND	U		0.140	ND	U		0.160	ND	U		0.160	ND	U		0.100	ND	U		0.170	ND	U		0.140	ND	U		0.170	ND	U		0.170	ND	U		0.110	ND	U		0.091	ND	U		0.110	ND	U		0.110	ND	U		0.110
MAK132L	3/28/2014	ND	U		0.120	ND	U		0.120	ND	U		0.120	ND	U		0.120	ND	U		0.120	ND	U		0.130	ND	U		0.130	ND	U		0.160	ND	U		0.160	ND	U		0.090	ND	U		0.078	ND	U		0.082	ND	U		0.099	ND	U		0.087
MAK134L	3/28/2014	ND	U		0.081	0.097			0.081	ND	U		0.055	0.110			0.055	ND	U		0.036	ND	U		0.026	ND	U		0.031	ND	U		0.034	ND	U		0.034	ND	U		0.028	ND	U		0.025	ND	U		0.032	ND	U		0.036	ND	U		0.030
MAK135L	3/28/2014	ND	JZ	U	0.074	ND	U		0.074	ND	U		0.053	0.140			0.053	ND	U		0.037	ND	U		0.029	ND	U		0.033	ND	U		0.040	ND	U		0.040	ND	U		0.023	ND	U		0.022	ND	U		0.020	ND	U		0.028	ND	U		0.023
MAK138L	3/28/2014	ND		U	0.1000	0.310		J	0.100	ND	U		0.052	ND	U		0.052	ND	U		0.055	ND	U		0.039	ND	U		0.047	ND	U		0.049	ND	U		0.049	ND	U		0.030	ND	U		0.025	ND	U		0.024	ND	U		0.032	ND	U		0.028

Notes:

Bold results exceed the project screening values.

[1] Final screening values from fish advisories as listed in Table 9 of the *Final Supplemental Marine Resources Study Sampling and Analysis Plan* (August 2013).

[2] Results presented as "ND" in the the Pace Analytical laboratory reports are presented in the Staged Electronic Data Deliverable (SEDD) with a "U" qualifier and thus are presented in this table with the LQ.

[3] For Hi-Res analysis, if results are outside of an ion-ratio comparison, then they are reported as Estimated Maximum Possible Concentration (EMPC), which will carry a laboratory "J" qualifier. EMPC results are indicated in the SEDD, and thus in this table, with a "Z" qualifier. In the Pace Analytical laboratory reports, "J" qualifiers also define results that are greater than the sample specific estimated detection limit (EDL) but less than the laboratory contract required quantitation limit (CRQL). Per the analytical method, the limit of detection equals the estimated quantitation limit, therefore method detection limits and CRQLs did not apply; therefore, detects less than the CRQL were not flagged "J" in the SEDDs and thus not in this data table.

[4] The RL value presented in the Pace Analytical laboratory report is equivalent to the sample specific EDL.

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Table F-5a: Concentrations of Dioxins/Dibenzofurans in Biota Tissue, Mākua Marine Resources Supplemental Study

	Analyte	2,3,7,8-TCDF				Total TCDF				2,3,7,8-TCDD				Total TCDD				1,2,3,7,8-PeCDF				2,3,4,7,8-PeCDF				Total PeCDF				1,2,3,7,8-PeCDD				Total PeCDD				1,2,3,4,7,8-HxCDF				1,2,3,6,7,8-HxCDF				2,3,4,6,7,8-HxCDF				1,2,3,7,8,9-HxCDF				Total HxCDF			
	CAS Number	*51207-31-9*				*30402-14-3*				*01746-01-6*				*41903-57-5*				*57117-41-6*				*57117-31-4*				*30402-15-4*				*40321-76-4*				*36088-22-9*				*70648-26-9*				*57117-44-9*				*60851-34-5*				*72918-21-9*				*55684-94-1*			
	Project Screening Values[1]	*3.08*				*3.08*				*0.308*				*0.308*				*1.03*				*1.03*				*1.03*				*0.308*				*0.308*				*3.08*				*3.08*				*3.08*				*3.08*				*3.08*			
	Units	*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*			
Lab ID	Collection Date	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]

ID - identification

ng/kg-wet - nanograms per kilogram-wet weight

ND - not detected

PCDE - polychlorinated diphenyl ethers

RL - reporting limit

Laboratory Qualifier (LQ)

[B] - Less than 10x higher than method blank level.

[J] - Estimated value.

[U] - Analyte not detected.

[Z] - Indicates an EMPC result. The result is qualified in the Pace Analytical laboratory report as a "J" with either an "I" (interference present) or "P" (PCDE interference) qualifier.

Validator Qualifier (VQ)

[J] - Indicates an estimated value.

[U] - Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

[UJ] - Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

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Table F-5b: Concentrations of Dioxins/Dibenzofurans in Biota Tissue, Mākua Marine Resources Supplemental Study

		Analyte	1,2,3,4,7,8-HxCDD				1,2,3,6,7,8-HxCDD				1,2,3,7,8,9-HxCDD				Total HxCDD				1,2,3,4,6,7,8-HpCDF				1,2,3,4,7,8,9-HpCDF				Total HpCDF				1,2,3,4,6,7,8-HpCDD				Total HpCDD				OCDF				OCDD			
		CAS Number	39227-28-6				57653-85-7				19408-74-3				34465-46-8				67562-39-4				55673-89-7				38998-75-3				35822-46-9				37871-00-4				39001-02-0				03268-87-9			
		Project Screening Values[1]	3.08				3.08				3.08				3.08				30.8				30.8				30.8				30.8				30.8				1,030				1,030			
		Units	ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet				ng/kg-wet			
Lab ID	Collection Date		Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]
Mākua																																																
Octopus (He'e)																																																
Dry Season																																																
MAK001O	9/9/2013		ND	U		0.093	ND	U		0.110	ND	U		0.110	ND	U		0.100	0.068			0.065	ND	U		0.120	0.220			0.093	0.370			0.110	0.710			0.110	ND	U		0.350	ND	BJZ	U	0.420
MAK002O	9/9/2013		ND	U		0.140	ND	U		0.140	ND	U		0.140	0.14			0.140	ND	U		0.073	ND	U		0.130	0.17			0.100	0.28			0.170	0.61			0.170	ND	U		0.710	ND	BJZ	U	1.000
MAK003O	9/9/2013		ND	U		0.140	ND	U		0.160	ND	U		0.150	ND	U		0.150	ND	U		0.085	ND	U		0.110	ND	U		0.098	0.26	JZ		0.150	ND	U		0.150	ND	U		0.640	ND		U	1.200
MAK004O	9/11/2013		ND	U		0.170	ND	U		0.210	ND	U		0.170	ND	U		0.180	ND	U		0.110	ND	U		0.160	ND	U		0.130	0.34	JZ		0.180	ND	U		0.180	ND	U		0.730	ND	BJZ	U	1.200
MAK005O	9/11/2013		ND	U		0.140	ND	U		0.140	ND	U		0.110	ND	U		0.130	ND	U		0.075	ND	U		0.130	0.120			0.100	0.300			0.110	0.300			0.110	ND	U		0.570	ND		U	1.000
MAK006O	9/11/2013		ND	U		0.120	ND	U		0.150	ND	U		0.150	ND	U		0.140	ND	U		0.100	ND	U		0.120	ND	U		0.110	ND	U		0.130	0.17			0.130	ND	U		0.640	ND		U	0.960
MAK007O	9/11/2013		ND	U		0.130	ND	U		0.099	ND	U		0.110	ND	U		0.110	ND	U		0.060	ND	U		0.080	ND	U		0.070	0.26	JZ		0.110	0.310			0.110	ND	U		0.420	ND	BJZ	U	0.660
MAK008O	9/11/2013		ND	U		0.170	ND	U		0.180	ND	U		0.190	ND	U		0.180	ND	U		0.100	ND	U		0.160	ND	U		0.130	0.20	JZ		0.160	0.24			0.160	ND	U		0.970	ND	U		1.700
Wet Season																																																
MAK101O	1/13/2014		ND	U		0.040	0.047			0.041	ND	U		0.037	0.047			0.039	ND		U	0.030	ND		U	0.034	0.100		J	0.032	ND		U	0.034	0.210			0.034	ND	JZ	U	0.170	ND	BJZ	U	0.140
MAK102O	1/13/2014		ND	U		0.032	ND	U		0.033	ND	U		0.033	ND	U		0.033	ND	U		0.024	ND	U		0.032	ND	U		0.028	ND	JZ	U	0.040	0.085			0.040	ND	U		0.110	ND	BJZ	U	0.190
MAK103O	1/13/2014		ND	U		0.041	ND	U		0.043	ND	U		0.043	ND	U		0.042	ND	U		0.036	ND	U		0.042	ND	U		0.039	ND		U	0.050	0.130			0.050	ND	U		0.140	ND	BJZ	U	0.250
MAK104O	1/13/2014		ND	U		0.032	ND	U		0.034	ND	U		0.032	ND	U		0.033	ND	U		0.028	ND	U		0.035	ND	U		0.031	ND		U	0.039	0.140			0.039	ND	U		0.130	ND		U	0.210
MAK105O	1/13/2014		ND	U		0.046	ND	U		0.046	ND	U		0.041	ND	U		0.044	ND	U		0.032	ND	U		0.046	ND	U		0.039	ND		U	0.048	0.150			0.048	ND	U		0.120	ND		U	0.270
MAK106O	1/13/2014		ND	U		0.034	ND	U		0.034	ND	U		0.034	ND	U		0.034	ND	U		0.028	ND	U		0.032	ND	U		0.030	ND		U	0.038	0.160			0.038	ND	U		0.100	ND		U	0.190
MAK107O	1/13/2014		ND	U		0.049	ND	U		0.052	ND	U		0.047	ND	U		0.049	ND	U		0.036	ND	U		0.053	ND	U		0.045	ND	U		0.070	ND	U		0.070	ND	U		0.140	ND	U		0.270
MAK108O	1/13/2014		ND	U		0.039	ND	U		0.038	ND	U		0.035	ND	U		0.037	ND	U		0.028	ND	U		0.030	ND	U		0.029	ND	JZ	U	0.045	0.070			0.045	ND	U		0.091	ND		U	0.160
Sea Cucumber (Loli)																																																
Dry Season																																																
MAK001C	9/9/2013		ND	U		0.230	ND	U		0.320	ND	U		0.270	ND	U		0.270	ND	U		0.150	ND	U		0.180	0.18			0.16	0.460	JZ		0.410	0.67			0.410	ND		UJ	0.330	ND		U	0.650
MAK002C	9/9/2013		ND	U		0.140	ND	U		0.160	ND	U		0.15	ND	U		0.150	ND	U		0.066	ND	U		0.097	0.11			0.082	ND	U		0.100	0.24			0.100	ND	BJZ	U	0.200	ND	BJZ	U	0.540
MAK004C	9/9/2013		ND	U		0.096	ND	U		0.110	ND	U		0.110	ND	U		0.100	ND	U		0.072	ND	U		0.092	0.089			0.082	0.140			0.120	0.140			0.120	ND	U		0.200	ND		U	0.570
MAK005C	9/9/2013		ND	U		0.079	ND	U		0.100	ND	U		0.096	ND	U		0.091	ND	U		0.110	ND	U		0.130	ND	U		0.120	ND	U		0.100	0.20			0.100	ND		U	0.170	ND		U	0.550
MAK006C	9/11/2013		ND	U		0.088	ND	U		0.120	ND	U		0.100	0.21			0.100	ND	U		0.064	ND	U		0.088	ND	U		0.076	0.22			0.130	0.38			0.130	ND	BJZ	U	0.180	ND	BJZ	U	0.470
MAK007C	9/11/2013		ND	U		0.086	ND	U		0.090	ND	U		0.100	ND	U		0.093	ND	U		0.069	ND	U		0.086	ND	U		0.078	0.16			0.120	0.35			0.120	ND		U	0.160	ND		U	0.570
MAK008C	9/11/2013		ND	U		0.090	ND	U		0.110	ND	U		0.110	ND	U		0.100	ND	U		0.071	ND	U		0.092	ND	U		0.081	0.19			0.120	0.19			0.120	ND	U		0.180	ND	BJZ	U	0.500
MAK009C	9/11/2013		ND	U		0.082	ND	U		0.085	ND	U		0.095	ND	U		0.087	ND	U		0.058	ND	U		0.090	0.088			0.074	0.14	JZ		0.099	0.180			0.099	ND	BJZ	U	0.150	ND		U	0.420
Wet Season																																																
MAK102C	1/13/2014		ND	U		0.047	ND	U		0.057	ND	U		0.048	ND	U		0.050	0.031	JZ		0.027	ND	U		0.033	ND	U		0.030	0.130	JZ		0.047	0.082			0.047	ND	U		0.081	ND	JZ	U	0.210
MAK103C	1/13/2014		ND	U		0.036	ND	U		0.042	ND	U		0.036	ND	U		0.038	ND	U		0.025	ND	U		0.048	ND	U		0.037	0.140			0.054	0.140			0.054	ND	U		0.074	0.610			0.180
MAK104C	1/13/2014		ND	U		0.031	ND	U		0.036	ND	U		0.032	ND	U		0.033	ND	U		0.032	ND	U		0.043	ND	U		0.038	0.12			0.049	0.12			0.049	ND	U		0.094	ND	JZ	U	0.180
MAK105C	1/13/2014		ND	U		0.024	ND	U		0.026	ND	U		0.026	ND	U		0.025	ND	U		0.024	ND	U		0.036	ND	U		0.030	0.073	JZ		0.043	0.087			0.043	ND	U		0.080	ND	JZ	U	0.084
MAK106C	1/13/2014		ND	U		0.028	ND	U		0.031	ND	U		0.028	ND	U		0.029	0.056			0.024	ND	U		0.047	0.056			0.035	0.094			0.073	0.094			0.073	ND	U		0.043	ND		U	0.065
MAK107C	1/13/2014		ND	U		0.026	ND	U		0.024	ND	U		0.024	ND	U		0.025	ND	U		0.021	ND	U		0.037	ND	U		0.029	0.082	JZ		0.036	ND	U		0.036	ND	U		0.058	ND	JZ	U	0.130
MAK108C	1/13/2014		0.037			0.032	ND	U		0.035	0.033	JZ		0.032	0.037			0.033	0.058	JZ		0.026	ND	U		0.034	ND	U		0.030	0.100	JZ		0.036	0.100			0.036	0.240			0.075	0.650			0.110
MAK110C	1/14/2014		ND	U		0.031	ND	U		0.030	ND	U		0.029	ND	U		0.030	0.065	JZ		0.030	ND	U		0.036	ND	U		0.033	0.15			0.058	0.15			0.058	0.120	JZ		0.089	0.73			0.060
Seaweed (Limu kohu)																																																
Dry Season																																																
MAK001L/2L/26L	9/9/2013; 9/10/2013; 9/27/2013		ND	U		0.066	ND	U		0.081	ND	U		0.077	ND	U		0.074	0.074	JZ		0.038	ND	U		0.043	ND	U		0.041	ND	BJZ	U	0.031	0.140		J	0.031	ND	JZ	U	0.088	ND		U	0.110
MAK013L	9/18/2013		ND	U		0.086	ND	U		0.100	ND	U		0.095	ND	U		0.095	0.077	JZ		0.047	ND	U		0.062	0.078			0.054	ND		U	0.051	0.250		J	0.051	ND	JZ	U	0.110	ND		U	0.140
MAK016L/21L/27L	9/23/2013; 9/27/2013; 9/27/2013		ND	U		0.110	ND	U		0.081	1.100	JZ		0.076	ND	U		0.090	0.087			0.049	ND	U		0.055	0.150			0.052	ND	BJZ	U	0.044	ND	U		0.044	ND	JZ	U	0.110	ND	BJZ	U	0.140
MAK022L	9/27/2013		ND	U		0.065	ND	U		0.076	ND	JZ	U	0.070	ND	U		0.070	0.060			0.033	ND	U		0.043	0.060			0.038	ND		U	0.034	0.170		J	0.034	ND		U	0.064	ND	BJZ	U	0.084
MAK023L	9/27/2013		ND	U		0.075	ND	JZ	U	0.083	ND	U		0.084	ND	U		0.081	ND	U		0.046	ND	U		0.060	ND	U		0.053	ND		U	0.051	0.095		J	0.051	ND	U		0.120	ND		U	0.180
MAK024L/25L	9/27/2013; 9/27/2013		ND	U		0.067	ND		U	0.083	ND	U		0.094	0.250		J	0.082	0.750			0.064	ND	U		0.072	4.500			0.068	3.600			0.079	9.400			0.079	10.000			0.130	60.000			0.190
MAK025L	9/27/2013		ND	U		0.110	ND	U		0.099	ND	U		0.110	ND	U		0.100	0.061			0.054	ND	U		0.069	0.140			0.062	ND	BJZ	U	0.052	0.140		J	0.052	ND	JZ	U	0.130	ND		U	0.200
MAK029L	10/11/2013		ND	U		0.200	ND	U		0.160	0.510	JZ		0.150	ND	U		0.170	0.064	JZ		0.041	0.057			0.045	0.057			0.043	ND		U	0.049	0.140		J	0.049	ND		U	0.087	ND	BJZ	U	0.140
Wet Season																																																
MAK101L	1/13/2014		0.090	JZ		0.048	ND	U		0.059	ND	U		0.049	ND	U		0.052	0.040	JZ		0.025	ND	U		0.034	ND	U		0.030	0.045	JZ		0.024	ND	U		0.024	0.120	JZ		0.070	ND		U	0.099
MAK102L	1/13/2014		ND	U		0.033	ND	U		0.040	ND	U		0.035	ND	U		0.036	0.056			0.028	ND	U		0.036	0.056			0.032	0.100	JZ		0.037	0.130			0.037	ND	U		0.140	0.800			0.100
MAK105L	1/13/2014		0.056	JZ		0.045	ND	U		0.059	ND	U		0.049	ND	U		0.051	ND	U		0.035	ND	U		0.038	ND	U		0.037	0.065	JZ		0.043	ND	U		0.043	ND	U		0.120	ND		U	0.130
MAK106L	1/14/2014		ND	U		0.049	ND	U		0.051	ND	U		0.045	ND	U		0.048	0.051			0.034	ND	U		0.048	0.051			0.041	ND	U		0.051	0.081			0.051	ND	U		0.130	ND		U	0.120
MAK108,109,110,113L	1/14/2014; 1/14/2014; 1/14/2014; 1/14/2014		ND	U		0.055	ND	U		0.053	ND	U		0.049	ND	U		0.052	0.049	JZ		0.042	ND	U		0.056	ND	U		0.049	0.082			0.075	0.082			0.075	ND	U		0.120	0.690			0.120
MAK111L	1/14/2014		ND	U		0.061	ND	U		0.055	ND	U		0.053	ND	U		0.056	0.064	JZ		0.053	ND	U		0.063	ND	U		0.058	0.098	JZ		0.054	0.15			0.054	ND	U		0.140	0.79			0.160
MAK112L	1/14/2014		ND	U		0.048	ND	U		0.056	ND	U		0.049	ND	U		0.051	0.054	JZ		0.053	ND	U		0.057	ND	U		0.055	0.070	JZ		0.065	0.140			0.065	ND	U		0.160	ND	JZ	U	0.160
MAK115L	1/14/2014		ND	U		0.079	ND	U		0.083	ND	U		0.070	ND	U		0.078	ND	U		0.040	ND	U		0.041	ND	U		0.040	ND	U		0.075	0.075			0.075	ND	U		0.130	ND		U	0.230

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Table F-5b: Concentrations of Dioxins/Dibenzofurans in Biota Tissue, Mākua Marine Resources Supplemental Study

		Analyte	1,2,3,4,7,8-HxCDD				1,2,3,6,7,8-HxCDD				1,2,3,7,8,9-HxCDD				Total HxCDD				1,2,3,4,6,7,8-HpCDF				1,2,3,4,7,8,9-HpCDF				Total HpCDF				1,2,3,4,6,7,8-HpCDD				Total HpCDD				OCDF				OCDD			
		CAS Number	*39227-28-6*				*57653-85-7*				*19408-74-3*				*34465-46-8*				*67562-39-4*				*55673-89-7*				*38998-75-3*				*35822-46-9*				*37871-00-4*				*39001-02-0*				*03268-87-9*			
		Project Screening Values[1]	*3.08*				*3.08*				*3.08*				*3.08*				*30.8*				*30.8*				*30.8*				*30.8*				*30.8*				*1,030*				*1,030*			
		Units	*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*			
Lab ID	**Collection Date**		**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**	**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**	**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**	**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**	**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**	**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**	**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**	**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**	**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**	**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**	**Result[2]**	**LQ[3]**	**VQ**	**RL[4]**
Mokulēʻia																																														
***Octopus* (*Heʻe*)**																																														
Dry Season																																														
MAK009O	9/13/2013		0.072			0.029	ND		U	0.042	ND	JZ	U	0.035	0.170		J	0.036	ND		U	0.033	ND		U	0.040	0.140		J	0.037	ND		U	0.046	0.410		J	0.046	ND		U	0.089	ND		U	0.078
MAK010O	9/16/2013		ND	U		0.075	ND	BJZ	U	0.070	ND	U		0.074	ND	U		0.073	ND		U	0.058	ND	U		0.078	0.089		J	0.068	ND	BJZ	U	0.079	0.120		J	0.079	ND	BJZ	U	0.160	ND		U	0.270
MAK011O	9/16/2013		ND	U		0.060	ND	U		0.070	ND	U		0.068	0.079			0.066	ND	U		0.044	ND	U		0.051	ND	U		0.048	ND		U	0.054	0.280		J	0.054	ND		U	0.130	ND		U	0.220
MAK015O	9/22/2013		ND	U		0.037	ND	U		0.047	ND	U		0.042	ND	U		0.042	ND		U	0.029	ND	U		0.033	0.088		J	0.031	ND		U	0.036	0.130		J	0.036	ND	BJZ	U	0.053	ND		U	0.110
MAK016O	9/22/2013		ND	U		0.041	ND	U		0.044	ND	U		0.037	0.086			0.041	ND		U	0.039	ND	U		0.049	0.110		J	0.044	ND		U	0.037	0.180		J	0.037	ND	BJZ	U	0.062	ND		U	0.110
MAK017O	9/22/2013		ND	U		0.044	ND	U		0.050	ND	U		0.049	0.100			0.048	ND		U	0.032	ND	U		0.046	0.093		J	0.039	ND	BJZ	U	0.039	ND	U		0.039	ND	BJZ	U	0.058	ND		U	0.200
MAK018O	9/22/2013		ND	U		0.042	ND	U		0.041	ND	U		0.036	0.088			0.040	ND	BJZ	U	0.034	ND	U		0.031	ND	U		0.032	ND		U	0.039	0.110		J	0.039	ND	BJZ	U	0.082	ND		U	0.160
MAK024O	9/27/2013		ND	U		0.097	ND	U		0.110	ND	U		0.130	0.27			0.110	ND	BJZ	U	0.074	ND	U		0.100	ND	U		0.088	1.20			0.180	1.20			0.18	ND		U	0.200	ND		U	0.390
Wet Season																																														
MAK109O	1/31/2014		ND	U		0.071	ND	U		0.068	ND	U		0.069	ND	U		0.069	ND	U		0.084	ND	U		0.120	ND	U		0.100	0.11	JZ		0.066	ND	U		0.066	ND	U		0.180	ND	U		0.370
MAK118O	3/27/2014		ND	U		0.051	0.069	JZ		0.053	ND	U		0.060	ND	U		0.054	ND	U		0.057	ND	U		0.075	ND	U		0.066	0.17			0.066	0.17			0.066	ND	U		0.170	0.520	JZ		0.290
MAK119O	3/27/2014		ND	U		0.160	ND	U		0.180	ND	U		0.150	ND	U		0.16	0.11	JZ		0.098	ND	U		0.140	ND	U		0.120	0.21	JZ		0.130	0.17			0.130	0.38			0.230	0.47	JZ		0.460
MAK120O	3/27/2014		ND	U		0.120	ND	U		0.100	ND	U		0.097	ND	U		0.100	ND	U		0.094	ND	U		0.120	ND	U		0.110	ND	U		0.120	ND	U		0.120	ND	U		0.200	ND	U		0.380
MAK121O	3/27/2014		ND	U		0.12	0.14	JZ		0.13	ND	U		0.12	ND	U		0.12	0.13			0.11	ND	U		0.14	0.13			0.13	ND	U		0.14	0.14			0.14	ND	U		0.27	ND	U		0.41
MAK122O	3/27/2014		ND	U		0.140	ND	U		0.150	ND	U		0.140	ND	U		0.140	ND	U		0.084	ND	U		0.120	ND	U		0.100	0.13	JZ		0.120	0.14			0.120	ND	U		0.250	ND	U		0.400
MAK123O	3/27/2014		ND	U		0.110	ND	U		0.120	ND	U		0.100	ND	U		0.110	ND	U		0.069	ND	U		0.089	ND	U		0.079	ND	U		0.150	ND	U		0.150	ND	U		0.230	ND	U		0.360
MAK124O	3/28/2014		ND	U		0.130	ND	U		0.160	ND	U		0.150	ND	U		0.140	ND	U		0.075	ND	U		0.086	ND	U		0.081	ND	U		0.087	ND	U		0.087	ND	U		0.190	ND	U		0.340
***Sea Cucumber* (*Loli*)**																																														
Dry Season																																														
MAK010C	9/13/2013		ND	U		0.18	ND	U		0.19	ND	U		0.18	ND	U		0.19	ND	U		0.17	ND	U		0.22	ND	U		0.19	ND	U		0.23	ND	U		0.23	ND	U		0.47	ND	U		0.76
MAK014C	9/13/2013		ND	U		0.18	ND	U		0.24	ND	U		0.24	ND	U		0.22	ND	U		0.18	ND	U		0.24	ND	U		0.21	ND	U		0.28	0.51			0.28	ND	U		0.53	1.9	JZ		0.78
MAK020C	9/16/2013		ND	U		0.073	ND	U		0.078	0.096			0.057	0.550			0.069	0.068			0.050	ND	U		0.059	0.220			0.055	0.770			0.110	1.700			0.11	0.230			0.110	3.500			0.130
MAK022C	9/16/2013		ND	U		0.071	ND	U		0.066	ND	U		0.068	ND	U		0.068	ND	U		0.041	ND	U		0.054	ND	U		0.048	0.200	JZ		0.051	0.20			0.051	ND	U		0.092	0.88			0.120
MAK024C	9/22/2013		ND	U		0.045	ND	U		0.059	ND	U		0.050	0.130			0.051	ND	U		0.035	ND	U		0.041	ND	U		0.038	0.270			0.033	0.270			0.033	0.084	JZ		0.064	0.900			0.120
MAK025C	9/22/2013		ND	U		0.051	0.087			0.054	ND	U		0.045	0.087			0.050	0.043	JZ		0.032	ND	U		0.049	0.065			0.040	0.890			0.043	1.400			0.043	ND	U		0.097	3.500			0.130
MAK026C	9/22/2013		ND	U		0.080	ND	U		0.073	ND	U		0.064	ND	U		0.072	ND	U		0.037	ND	U		0.072	ND	U		0.055	0.150			0.049	0.250			0.049	ND	U		0.110	0.61	JZ		0.150
MAK027C	9/22/2013		ND	U		0.046	ND	U		0.050	ND	U		0.043	ND	U		0.047	0.047			0.037	ND	U		0.053	0.047			0.045	0.110			0.044	0.110			0.044	ND	U		0.088	0.490			0.150
Wet Season																																														
MAK111C	1/31/2014		ND	U		0.065	ND	U		0.059	ND	U		0.071	ND	U		0.065	ND	U		0.041	ND	U		0.061	ND	U		0.051	ND		U	0.076	0.140			0.076	ND	U		0.110	ND		U	0.180
MAK113C	1/31/2014		ND	U		0.052	0.049	JZ		0.048	ND	U		0.049	ND	U		0.050	ND	U		0.034	ND	U		0.048	ND	U		0.041	ND		U	0.077	0.320			0.077	ND	U		0.100	ND		U	0.140
MAK114C	1/31/2014		ND	U		0.050	ND	U		0.052	ND	U		0.064	ND	U		0.055	0.075			0.046	ND	U		0.067	0.075			0.056	ND		U	0.096	0.340			0.096	ND	U		0.110	ND		U	0.210
MAK115C	1/31/2014		ND	U		0.051	ND	U		0.054	0.058			0.047	0.058			0.051	0.041	JZ		0.039	ND	U		0.050	ND	U		0.044	ND	JZ	U	0.068	ND	U		0.068	0.110			0.100	1.700			0.140
MAK116C	1/31/2014		ND	U		0.079	0.088			0.083	0.071			0.066	0.160			0.076	ND	U		0.050	ND	U		0.072	ND	U		0.061	ND		U	0.080	0.550			0.080	ND	U		0.130	1.6	JZ		0.120
MAK117C	1/31/2014		ND	U		0.060	0.087			0.071	ND	U		0.058	0.087			0.063	0.049	JZ		0.044	ND	U		0.057	ND	U		0.050	ND		U	0.063	0.510			0.063	ND	U		0.110	1.700			0.150
MAK118C	1/31/2014		0.055			0.046	0.099	JZ		0.044	0.084			0.039	0.300			0.043	ND	U		0.032	ND	U		0.043	ND	U		0.038	0.750			0.076	0.840			0.076	ND	U		0.096	2.300			0.140
MAK120C	2/11/2014		0.063			0.042	0.100	JZ		0.056	0.058	JZ		0.057	0.120			0.052	0.067			0.038	ND	U		0.046	0.067			0.042	0.670	JZ		0.097	0.130			0.097	0.120			0.080	2.200			0.130
Seaweed (Limu kohu)																																														
Dry Season																																														
MAK007L	9/16/2013		ND	U		0.062	ND	U		0.071	ND		U	0.071	0.210		J	0.068	0.130			0.049	ND	U		0.049	0.230			0.049	ND		U	0.062	0.660		J	0.062	ND		U	0.120	ND		U	0.110
MAK009L	9/16/2013		ND	U		0.120	ND	U		0.140	ND	JZ	U	0.130	ND	U		0.130	0.080			0.032	ND	U		0.042	0.080			0.037	ND		U	0.052	0.380		J	0.052	ND	JZ	U	0.110	ND		U	0.096
MAK010L (comp)	9/16/2013		ND	U		0.066	ND	U		0.083	ND	U		0.076	0.15			0.075	0.11			0.042	ND	U		0.051	0.22			0.046	ND		U	0.057	0.23		J	0.057	ND		U	0.100	ND		U	0.140
MAK044L	10/15/2013		ND	U		0.068	0.064	JZ		0.059	ND	U		0.066	0.18			0.064	0.12			0.049	ND	U		0.062	0.12			0.056	ND	JZ	U	0.053	0.37			0.053	ND	BJZ	U	0.120	ND		U	0.130
MAK045L	10/15/2013		ND	U		0.150	ND	U		0.130	0.32	JZ		0.130	ND	U		0.140	0.11	JZ		0.052	ND	U		0.071	0.092			0.061	ND		U	0.075	0.460			0.075	ND	BJZ	U	0.150	ND		U	0.210
MAK046L	10/15/2013		ND	U		0.089	ND	U		0.095	ND	U		0.081	ND	U		0.088	0.120			0.053	ND	U		0.070	0.120			0.062	ND	JZ	U	0.079	0.300			0.079	ND	BJZ	U	0.130	ND		U	0.150
MAK047L	10/15/2013		ND	U		0.079	ND	U		0.072	ND	U		0.067	0.210			0.072	0.110			0.037	ND	U		0.044	0.240			0.041	ND		U	0.043	0.730			0.043	ND		U	0.079	ND		U	0.079
MAK049L	10/15/2013		ND	U		0.130	ND	U		0.150	0.55	JZ		0.180	ND	U		0.150	0.11	JZ		0.052	ND	U		0.058	ND	U		0.055	ND		U	0.064	0.34		J	0.064	ND		U	0.180	2.60			0.200
Wet Season																																														
MAK120L	1/31/2014		ND	U		0.086	ND	U		0.094	ND	U		0.065	ND	U		0.082	0.099	JZ		0.045	ND	U		0.083	0.14			0.064	ND		U	0.094	0.55			0.094	0.24			0.160	2.40			0.160
MAK121L	1/31/2014		ND	U		0.089	ND	U		0.081	ND	U		0.089	ND	U		0.086	ND	U		0.061	ND	U		0.081	ND	U		0.071	ND		U	0.092	0.15			0.092	ND	U		0.150	ND		U	0.230
MAK122L	1/31/2014		ND	U		0.086	ND	U		0.075	ND	U		0.083	ND	U		0.081	ND	U		0.045	ND	U		0.060	ND	U		0.052	ND	U		0.092	ND	U		0.092	ND	U		0.130	ND	JZ	U	0.210
MAK123L	1/31/2014		ND	U		0.057	ND	U		0.073	ND	U		0.057	ND	U		0.062	ND	U		0.035	ND	U		0.042	ND	U		0.039	ND	JZ	U	0.061	0.11			0.061	ND	U		0.110	ND		U	0.170
MAK124L	1/31/2014		ND	U		0.045	ND	U		0.062	ND	U		0.064	ND	U		0.057	0.16			0.054	ND	U		0.079	0.46			0.067	0.63			0.095	1.20			0.095	0.49			0.150	6.90			0.160
MAK126L	1/31/2014		ND	U		0.069	ND	U		0.077	ND	U		0.069	0.20			0.071	0.19			0.049	ND	U		0.085	0.19			0.067	ND		U	0.120	1.20			0.120	0.54			0.140	6.90			0.170
MAK127L	2/11/2014		ND	U		0.034	ND	U		0.031	ND	U		0.030	ND	U		0.031	0.048	JZ		0.024	0.048			0.035	0.048			0.030	ND		U	0.022	0.260			0.022	ND		U	0.055	ND		U	0.100
MAK128L	2/11/2014		ND	U		0.026	ND	U		0.024	ND	U		0.023	ND	U		0.024	0.061			0.018	ND	U		0.019	0.061			0.019	ND		U	0.019	0.190			0.019	ND	JZ	U	0.042	ND		U	0.066

Draft

Table F-5b: Concentrations of Dioxins/Dibenzofurans in Biota Tissue, Mākua Marine Resources Supplemental Study

		Analyte	1,2,3,4,7,8-HxCDD				1,2,3,6,7,8-HxCDD				1,2,3,7,8,9-HxCDD				Total HxCDD				1,2,3,4,6,7,8-HpCDF				1,2,3,4,7,8,9-HpCDF				Total HpCDF				1,2,3,4,6,7,8-HpCDD				Total HpCDD				OCDF				OCDD			
		CAS Number	*39227-28-6*				*57653-85-7*				*19408-74-3*				*34465-46-8*				*67562-39-4*				*55673-89-7*				*38998-75-3*				*35822-46-9*				*37871-00-4*				*39001-02-0*				*03268-87-9*			
		Project Screening Values[1]	*3.08*				*3.08*				*3.08*				*3.08*				*30.8*				*30.8*				*30.8*				*30.8*				*30.8*				*1,030*				*1,030*			
		Units	*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*			
Lab ID	Collection Date		Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]
Ka'ena Point																																														
***Octopus* (*He'e*)**																																														
Dry Season																																														
MAK012O	9/22/2013		ND	U	0.042		ND	U	0.043		ND	U	0.042		ND	U	0.042		ND	BJZ	U	0.028	ND	JZ	U	0.036	ND	U	0.032		ND	U	0.046		0.120	J	0.046		ND	BJZ	U	0.077		ND	U	0.110
MAK013O	9/22/2013		ND	U	0.046		ND	U	0.046		ND	U	0.053		0.076		0.048		ND	BJZ	U	0.047	ND	U		0.067	0.069	J	0.057		ND	U	0.074		0.440	J	0.074		ND	BJZ	U	0.120		ND	U	0.140
MAK014O	9/23/2013		ND	U	0.035		ND	U	0.043		ND	U	0.047		0.082		0.042		ND	BJZ	U	0.030	ND	U		0.036	0.072	J	0.033		ND	U	0.045		0.240	J	0.045		ND	BJZ	U	0.066		ND	U	0.180
MAK019O	9/23/2013		ND	U	0.039		ND	U	0.041		ND	U	0.039		ND	U	0.040		ND		U	0.031	ND	U		0.044	0.043	J	0.038		ND	U	0.033		0.190	J	0.033		ND	BJZ	U	0.069		ND	U	0.130
MAK020O	9/23/2013		ND	U	0.041		ND	U	0.042		ND	U	0.040		ND	U	0.041		ND		U	0.031	ND	U		0.045	0.099	J	0.038		ND	U	0.038		0.220	J	0.038		ND		U	0.076		ND	U	0.140
MAK021O	9/23/2013		ND	U	0.041		ND	U	0.051		ND	U	0.050		ND	U	0.047		ND		U	0.026	ND	U		0.032	0.049	J	0.029		ND	U	0.037		0.200	J	0.037		ND		U	0.068		ND	U	0.140
MAK022O	9/23/2013		ND	U	0.041		ND	U	0.044		ND	U	0.042		ND	U	0.042		ND		U	0.031	ND	U		0.040	0.047	J	0.035		ND	U	0.046		0.220	J	0.046		ND		U	0.081		ND	BJZ	U	0.140
MAK023O	9/23/2013		ND	U	0.036		ND	U	0.036		ND	U	0.036		ND	U	0.036		ND	BJZ	U	0.035	ND	U		0.044	0.370	J	0.039		ND	U	0.041		0.460	J	0.041		ND		U	0.120		ND	U	0.150
Wet Season																																														
MAK110O	3/28/2014		ND	U	0.075		ND	U	0.069		ND	U	0.062		ND	U	0.068		ND	U		0.059	ND	U		0.069	ND	U	0.064		ND	U	0.072		ND	U	0.072		ND	U		0.260		0.39		0.39
MAK111O	3/28/2014		ND	U	0.051		ND	U	0.079		ND	U	0.095		ND	U	0.075		ND	U		0.050	ND	U		0.083	ND	U	0.066		ND	U	0.110		ND	U	0.110		ND	U		0.270		ND	U	0.780
MAK112O	3/28/2014		ND	U	0.055		ND	U	0.067		ND	U	0.065		ND	U	0.062		ND	U		0.091	ND	U		0.095	ND	U	0.093		ND	U	0.130		ND	U	0.130		ND	U		0.260		ND	U	0.700
MAK113O	3/28/2014		ND	U	0.062		ND	U	0.089		ND	U	0.078		ND	U	0.076		ND	U		0.071	ND	U		0.110	ND	U	0.092		ND	U	0.067		ND	U	0.067		ND	U		0.220		ND	U	0.450
MAK114O	3/28/2014		ND	U	0.069		ND	U	0.054		ND	U	0.053		ND	U	0.059		0.064	JZ		0.050	ND	U		0.089	ND	U	0.070		ND	U	0.120		ND	U	0.120		ND	U		0.260		ND	U	0.530
MAK115O	3/28/2014		ND	U	0.072		ND	U	0.079		ND	U	0.056		ND	U	0.069		ND	U		0.052	ND	U		0.088	ND	U	0.070		0.087		0.083		0.087		0.083		ND	U		0.170		ND	U	0.380
MAK116O	3/28/2014		ND	U	0.060		ND	U	0.060		ND	U	0.064		ND	U	0.062		ND	U		0.076	ND	U		0.098	ND	U	0.087		ND	U	0.070		ND	U	0.070		ND	U		0.170		0.82	JZ	0.440
MAK117O	3/28/2014		ND	U	0.031		ND	U	0.043		ND	U	0.041		ND	U	0.038		ND	U		0.034	ND	U		0.049	ND	U	0.042		0.052	JZ	0.044		0.078		0.044		ND	U		0.140		0.310	JZ	0.220
***Sea Cucumber* (*Loli*)**																																														
Dry Season																																														
MAK015C	9/13/2013		ND	U	0.24		ND	U	0.25		ND	U	0.26		ND	U	0.25		ND	U		0.15	ND	U		0.21	ND	U	0.18		ND	U	0.25		ND	U	0.25		ND	U		0.45		ND	U	0.63
MAK018C	9/16/2013		ND	U	0.140		ND	U	0.150		ND	U	0.140		ND	U	0.140		ND	U		0.072	ND	U		0.110	ND	U	0.093		0.27		0.130		0.27		0.130		ND	U		0.300		1.00		0.410
MAK019C	9/16/2013		ND	U	0.180		ND	U	0.180		ND	U	0.180		ND	U	0.180		ND	U		0.098	ND	U		0.120	ND	U	0.110		ND	U	0.150		ND	U	0.150		ND	U		0.310		ND	U	0.720
MAK028C	9/22/2013		0.036	JZ	0.035		ND	U	0.047		0.066		0.040		0.180		0.041		0.064			0.028	0.057	JZ		0.040	0.064		0.034		0.130	JZ	0.040		ND	U	0.040		0.360			0.076		0.540		0.098
MAK029C	9/23/2013		ND	U	0.045		ND	U	0.048		ND	U	0.044		0.140		0.046		ND	U		0.038	ND	U		0.050	ND	U	0.044		0.120		0.042		0.120		0.042		0.130			0.090		0.610		0.120
MAK030C	9/23/2013		ND	U	0.130		ND	U	0.150		ND	U	0.110		ND	U	0.130		ND	U		0.063	ND	U		0.100	ND	U	0.081		ND	U	0.089		ND	U	0.089		ND	U		0.140		ND	U	0.31
MAK031C	9/23/2013		ND	U	0.040		ND	U	0.041		ND	U	0.044		ND	U	0.042		0.035			0.021	ND	U		0.034	0.035		0.028		0.100		0.046		0.100		0.046		0.110			0.100		0.46		0.120
MAK032C	9/23/2013		ND	U	0.046		ND	U	0.054		ND	U	0.048		ND	U	0.049		0.029	JZ		0.025	ND	U		0.054	ND	U	0.039		0.120		0.046		0.200		0.046		0.090	JZ		0.077		0.440		0.0700
Wet Season																																														
MAK121C	3/28/2014		ND	U	0.025		ND	U	0.029		ND	U	0.026		0.046		0.027		0.032	JZ		0.025	ND	U		0.044	ND	U	0.034		ND	BJZ	U	0.048		ND	U	0.048		ND	U		0.073		ND	U	0.098
MAK122C	3/28/2014		ND	U	0.025		ND	U	0.026		ND	U	0.024		0.039		0.025		0.040			0.030	ND	U		0.043	0.040		0.036		ND	BJZ	U	0.046		ND	U	0.046		ND	U		0.061		ND	JZ	U	0.150
MAK123C	3/28/2014		ND	U	0.042		ND	U	0.055		ND	U	0.043		ND	U	0.047		ND	U		0.035	ND	U		0.052	ND	U	0.044		ND	U	0.067		ND	U	0.067		0.096	JZ		0.079		ND	JZ	U	0.110
MAK124C	3/28/2014		ND	U	0.051		ND	U	0.062		ND	U	0.059		ND	U	0.057		ND	U		0.043	ND	U		0.058	ND	U	0.051		ND	U	0.084		ND	U	0.084		ND	U		0.180		ND	U	0.190
MAK125C	3/28/2014		ND	U	0.087		ND	U	0.086		ND	U	0.084		ND	U	0.086		ND	U		0.053	ND	U		0.077	ND	U	0.065		ND	U	0.110		ND	U	0.110		ND	U		0.140		ND	JZ	U	0.180
MAK126C	3/28/2014		ND	U	0.045		ND	U	0.051		ND	U	0.048		ND	U	0.048		ND	U		0.032	ND	U		0.054	ND	U	0.043		ND	U	0.087		ND	U	0.087		ND	U		0.200		ND	U	0.250
MAK127C	3/28/2014		ND	U	0.081		ND	U	0.094		ND	U	0.088		ND	U	0.088		ND	U		0.060	ND	U		0.072	ND	U	0.066		ND	U	0.089		ND	U	0.089		ND	U		0.160		ND	U	0.390
MAK128C	3/28/2014		ND	U	0.067		ND	U	0.071		ND	U	0.064		ND	U	0.067		ND	U		0.034	ND	U		0.062	ND	U	0.048		ND		U	0.082		0.10	J	0.082		ND	U		0.240		ND	U	0.270
Seaweed (Limu kohu)																																														
Dry Season																																														
MAK011L	9/16/2013		ND	U	0.150		ND	U	0.200		0.790	JZ	0.140		ND	U	0.160		0.073	JZ		0.042	ND	U		0.043	ND	U	0.042		ND		U	0.041		0.093	J	0.041		ND	JZ	U	0.098		ND	U	0.170
MAK030L	10/11/2013		ND	U	0.084		ND	U	0.090		ND	U	0.084		ND	U	0.086		0.110			0.043	ND	U		0.061	0.11		0.052		ND		U	0.042		0.30	J	0.042		ND		U	0.091		ND	U	0.140
MAK033L	10/11/2013		ND	U	0.140		ND	U	0.160		ND	JZ	U	0.140	ND	U	0.150		0.091			0.050	ND	U		0.053	0.091		0.051		ND		U	0.054		0.180	J	0.054		ND		U	0.200		ND	U	0.200
MAK034L	10/11/2013		ND	U	0.086		ND	U	0.110		ND	U	0.120		ND	U	0.100		0.089			0.056	ND	U		0.084	0.089		0.070		ND	BJZ	U	0.062		0.190	J	0.062		ND	U		0.180		ND	U	0.180
MAK038L	10/11/2013		ND	U	0.130		ND	U	0.140		ND	JZ	U	0.120	ND	U	0.130		0.077	JZ		0.064	ND	U		0.065	0.091		0.065		ND	BJZ	U	0.052		ND	U	0.052		ND	U		0.170		ND	U	0.190
MAK041L	10/11/2013		ND	U	0.090		ND	U	0.098		ND	U	0.090		ND	U	0.093		0.088	JZ		0.054	ND	U		0.069	0.072		0.061		ND		U	0.065		0.190	J	0.065		ND		U	0.170		ND	U	0.200
MAK042L	10/11/2013		ND	U	0.086		ND	U	0.100		ND	U	0.091		ND	U	0.092		0.064	JZ		0.062	ND	U		0.064	ND	U	0.063		ND	BJZ	U	0.079		0.20	J	0.079		ND	JZ	U	0.120		ND	U	0.190
MAK043L	10/11/2013		ND	U	0.110		ND	U	0.096		ND	U	0.093		ND	U	0.100		0.093	JZ		0.057	ND	U		0.069	0.063		0.063		ND		U	0.057		0.230	J	0.057		ND	JZ	U	0.140		ND	U	0.150
Wet Season																																														
MAK116L	1/31/2014		ND	U	0.016		ND	U	0.020		ND	U	0.016		ND	U	0.018		0.061			0.015	ND	U		0.019	0.061		0.017		0.300		0.023		0.870		0.023		ND		U	0.041		6.700		0.036
MAK117L	1/31/2014		ND	U	0.018	0.024	JZ	0.021	ND	U	0.018	0.023		0.019	0.065	JZ	0.019		ND	U		0.020	ND	U		0.019	ND		U	0.015	0.240		0.015		ND	JZ	U	0.028		ND		U	0.026
MAK118L	1/31/2014		ND	U	0.0150	0.018	JZ	0.0170	ND	U	0.0160		ND	U	0.0160	0.035	JZ	0.0120	ND	U		0.0150	ND	U		0.0130	ND	JZ	U	0.0160	0.092		0.0160		ND	JZ	U	0.0360		ND		U	0.0270
MAK130L	3/27/2014		ND	U	0.170		ND	U	0.170		ND	U	0.170		ND	U	0.170		ND	U		0.082	ND	U		0.110	ND	U	0.096		ND	U	0.140		ND	U	0.140		ND	U		0.300		ND	U	0.480
MAK132L	3/28/2014		ND	U	0.120		ND	U	0.110		ND	U	0.097		ND	U	0.110		ND	U		0.080	ND	U		0.100	ND	U	0.091		0.17		0.140		0.36		0.140		ND	U		0.240		0.55	JZ	0.210
MAK134L	3/28/2014		ND	U	0.034		ND	U	0.038		ND	U	0.037		ND	U	0.036		ND	U		0.025	ND	U		0.047	ND	U	0.036		ND	BJZ	U	0.038		ND	U	0.038		ND	U		0.120		ND	U	0.160
MAK135L	3/28/2014		ND	U	0.056		ND	U	0.059		ND	U	0.048		ND	U	0.054		ND	U		0.021	ND	U		0.030	ND	U	0.026		ND		U	0.046		0.088	J	0.046		ND	U		0.130		ND	U	0.170
MAK138L	3/28/2014		ND	U	0.026		ND	U	0.032		ND	U	0.029		ND	U	0.029		0.034	JZ		0.028	ND	U		0.040	ND	U	0.034		ND	U		0.040		0.084		0.040		ND	U		0.098		ND	U	0.120

Notes:

[1] Final screening values from fish advisories as listed in Table 9 of the *Final Supplemental Marine Resources Study Sampling and Analysis Plan* (August 2013).

[2] Results presented as "ND" in the the Pace Analytical laboratory reports are presented in the Staged Electronic Data Deliverable (SEDD) with a "U" qualifier and thus are presented in this table with the LQ.

[3] For Hi-Res analysis, if results are outside of an ion-ratio comparison, then they are reported as Estimated Maximum Possible Concentration (EMPC), which will carry a laboratory "J" qualifier. EMPC results are indicated in the SEDD, and thus in this table, with a "Z" qualifier. In the Pace Analytical laboratory reports, "J" qualifiers also define results that are greater than the sample specific estimated detection limit (EDL) but less than the laboratory contract required quantitation limit (CRQL). Per the analytical method, the limit of detection equals the estimated quantitation limit, therefore method detection limits and CRQLs did not apply; therefore, detects less than the CRQL were not flagged "J" in the SEDDs and thus not in this data table.

[4] The RL value presented in the Pace Analytical laboratory report is equivalent to the sample specific EDL.

CAS - Chemical Abstracts Service

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Table F-5b: Concentrations of Dioxins/Dibenzofurans in Biota Tissue, Mākua Marine Resources Supplemental Study

	Analyte	1,2,3,4,7,8-HxCDD				1,2,3,6,7,8-HxCDD				1,2,3,7,8,9-HxCDD				Total HxCDD				1,2,3,4,6,7,8-HpCDF				1,2,3,4,7,8,9-HpCDF				Total HpCDF				1,2,3,4,6,7,8-HpCDD				Total HpCDD				OCDF				OCDD			
	CAS Number	*39227-28-6*				*57653-85-7*				*19408-74-3*				*34465-46-8*				*67562-39-4*				*55673-89-7*				*38998-75-3*				*35822-46-9*				*37871-00-4*				*39001-02-0*				*03268-87-9*			
	Project Screening Values[1]	*3.08*				*3.08*				*3.08*				*3.08*				*30.8*				*30.8*				*30.8*				*30.8*				*30.8*				*1,030*				*1,030*			
	Units	*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*				*ng/kg-wet*			
Lab ID	Collection Date	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]	Result[2]	LQ[3]	VQ	RL[4]

ID - identification

ng/kg-wet - nanograms per kilogram-wet weight

ND - not detected

PCDE - polychlorinated diphenyl ethers

RL - reporting limit

Laboratory Qualifier (LQ)

[B] - Less than 10x higher than method blank level.

[J] - Estimated value.

[U] - Analyte not detected.

[Z] - Indicates an EMPC result. The result is qualified in the Pace Analytical laboratory report as a "J" with either an "I" (interference present) or "P" (PCDE interference) qualifier.

Validator Qualifier (VQ)

[J] - Indicates an estimated value.

[U] - Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

[UJ] - Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

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Table F-6a: Concentrations of Metals in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Aluminum					Antimony					Arsenic					Barium					Beryllium					Cadmium					Chromium					Cobalt					Copper				
CAS Number		7429-90-5					7440-36-0					7440-38-2					7440-39-3					7440-41-7					7440-43-9					7440-47-3					7440-48-4					7440-50-8				
Project Screening Values[1]		4,000					1.60					not defined					800					8.00					4.00					0.08					1.20					160				
Units		mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL
Mākua																																														
Octopus (He'e)																																														
Dry Season																																														
MAK001O	9/9/2013	ND	U		0.81	0.14	ND	U		0.02	0.007	25.2			0.040	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	**0.298**			0.121	0.018	ND	U		0.16	0.02	10.5			0.16	0.03
MAK002O	9/9/2013	ND	U		0.68	0.12	ND	U		0.02	0.006	21.5			0.034	0.012	ND	U		0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.103	0.015	ND	U		0.14	0.02	4.11			0.14	0.03
MAK003O	9/9/2013	0.18	B	J	0.71	0.12	ND	U		0.02	0.006	23.7			0.036	0.012	ND	U		0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.107	0.016	ND	U		0.14	0.02	14.5			0.14	0.03
MAK004O	9/11/2013	ND	U		0.71	0.12	ND	U		0.02	0.006	29.7			0.036	0.012	ND	U		0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.107	0.016	ND	U		0.14	0.02	6.23			0.14	0.03
MAK005O	9/11/2013	0.29	B	J	0.79	0.14	ND	U		0.02	0.007	27.5			0.040	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	U		0.119	0.018	ND	U		0.16	0.02	6.04			0.16	0.03
MAK006O	9/11/2013	ND	U		0.73	0.13	ND	U		0.02	0.006	37.8			0.037	0.013	ND	U		0.15	0.03	ND	U		0.08	0.03	0.008	B	J	0.02	0.006	ND	B	U	0.110	0.017	ND	U		0.15	0.02	6.72		J	0.15	0.03
MAK007O	9/11/2013	0.30	B	J	0.80	0.14	0.01	B	J	0.02	0.007	33.7			0.040	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	U		0.120	0.018	ND	U		0.16	0.02	8.64		J	0.16	0.03
MAK008O	9/11/2013	0.58	B	J	0.80	0.14	ND	U		0.02	0.007	24.2			0.040	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.120	0.018	ND	U		0.16	0.02	5.38			0.16	0.03
Wet Season																																														
MAK101O	1/13/2014	ND	U		0.77	0.13	ND	U		0.02	0.007	30.1	J	J	0.039	0.013	ND	U		0.15	0.03	ND	U		0.09	0.03	0.009	B	J	0.02	0.007	ND	U		0.116	0.017	ND	U		0.15	0.02	6.13			0.15	0.03
MAK102O	1/13/2014	0.53	B	J	0.79	0.14	ND	U		0.02	0.007	30.7	J	J	0.040	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	U		0.119	0.018	ND	U		0.16	0.02	7.25			0.16	0.03
MAK103O	1/13/2014	0.87			0.76	0.13	ND	U		0.02	0.007	32.3	J	J	0.038	0.013	ND	U		0.15	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	U		0.115	0.017	ND	U		0.15	0.02	4.14			0.15	0.03
MAK104O	1/13/2014	0.53	B	J	0.76	0.13	ND	U		0.02	0.007	27.5	J	J	0.038	0.013	ND	U		0.15	0.03	ND	U		0.09	0.03	0.008	B	J	0.02	0.007	ND	U		0.114	0.017	ND	U		0.15	0.02	7.80			0.15	0.03
MAK105O	1/13/2014	0.77	B	J	0.78	0.14	ND	U		0.02	0.007	24.2	J	J	0.039	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	0.008	B	J	0.02	0.007	0.019	B	J	0.117	0.018	ND	U		0.16	0.02	6.90			0.16	0.03
MAK106O	1/13/2014	0.55	B	J	0.77	0.13	ND	U		0.02	0.007	24.6	J	J	0.038	0.013	ND	U		0.15	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	U		0.115	0.017	ND	U		0.15	0.02	7.37			0.15	0.03
MAK107O	1/13/2014	0.55	B	J	0.76	0.13	ND	U		0.02	0.007	31.3	J	J	0.038	0.013	ND	U		0.15	0.03	ND	U		0.09	0.03	0.01	B	J	0.02	0.007	0.027	B	J	0.114	0.017	ND	U		0.15	0.02	6.32			0.15	0.03
MAK108O	1/13/2014	ND	U		0.78	0.14	ND	U		0.02	0.007	29.0	J	J	0.039	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	0.022	B	J	0.117	0.018	ND	U		0.16	0.02	7.56			0.16	0.03
Sea Cucumber (Loli)																																														
Dry Season																																														
MAK001C	9/9/2013	0.75	B		0.75	0.13	ND	U		0.02	0.007	0.497			0.037	0.013	0.06	B	J	0.15	0.03	ND	U		0.08	0.03	ND	U		0.02	0.007	**0.261**			0.112	0.017	ND	U		0.15	0.02	0.78			0.15	0.03
MAK002C	9/9/2013	2.34			0.79	0.14	ND	U		0.02	0.007	0.498			0.039	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.118	0.018	ND	U		0.16	0.02	0.43			0.16	0.03
MAK004C	9/9/2013	0.35	B	J	0.74	0.13	ND	U		0.02	0.006	0.719			0.037	0.013	ND	U		0.15	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND		U	0.111	0.017	ND	U		0.15	0.02	2.97			0.15	0.03
MAK005C	9/9/2013	0.64	B	J	0.78	0.14	ND	U		0.02	0.007	0.294			0.039	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.117	0.017	ND	U		0.16	0.02	0.31			0.16	0.03
MAK006C	9/11/2013	9.46			0.80	0.14	ND	U		0.02	0.007	0.441			0.040	0.014	0.06	B	J	0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.119	0.018	0.03	B	J	0.16	0.02	0.38			0.16	0.03
MAK007C	9/11/2013	2.32			0.71	0.12	ND	U		0.02	0.006	0.446			0.036	0.012	0.04	B	J	0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.107	0.016	ND	U		0.14	0.02	10.3			0.14	0.03
MAK008C	9/11/2013	5.39			0.71	0.12	ND	U		0.02	0.006	0.400			0.035	0.012	0.04	B	J	0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.106	0.016	ND	U		0.14	0.02	0.36			0.14	0.03
MAK009C	9/11/2013	0.82			0.75	0.13	0.01	B	J	0.02	0.007	0.536			0.038	0.013	0.06	B	J	0.15	0.03	ND	U		0.08	0.03	ND	U		0.02	0.007	ND	B	U	0.113	0.017	ND	U		0.15	0.02	0.35			0.15	0.03
Wet Season																																														
MAK102C	1/13/2014	0.68	B	J	0.80	0.14	ND	U		0.02	0.007	0.454	J	J	0.040	0.014	0.06	B	J	0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	0.046	B,M	J	0.120	0.018	ND	U		0.16	0.02	0.47			0.16	0.03
MAK103C	1/13/2014	14.2			0.77	0.13	ND	U		0.02	0.007	0.590	J	J	0.038	0.013	0.05	B	J	0.15	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	**0.141**			0.115	0.017	0.03	B	J	0.15	0.02	0.44			0.15	0.03
MAK104C	1/13/2014	4.07			0.79	0.14	ND	U		0.02	0.007	0.462	J	J	0.039	0.014	0.04	B	J	0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	**0.095**	B	J	0.118	0.018	ND	U		0.16	0.02	0.44			0.16	0.03
MAK105C	1/13/2014	1.40		J	0.80	0.14	ND	U		0.02	0.007	0.340	J	J	0.040	0.014	0.05	B	J	0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	**0.144**			0.121	0.018	0.03	B	J	0.16	0.02	0.46			0.16	0.03
MAK106C	1/13/2014	15.4			0.77	0.13	ND	U		0.02	0.007	0.750	J	J	0.038	0.013	0.10	B	J	0.15	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	**0.211**			0.115	0.017	0.04	B	J	0.15	0.02	0.69			0.15	0.03
MAK107C	1/13/2014	8.65			0.81	0.14	ND	U		0.02	0.007	0.540	J	J	0.040	0.014	0.11	B	J	0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	**0.326**			0.121	0.018	0.04	B	J	0.16	0.02	8.81			0.16	0.03
MAK108C	1/13/2014	4.50			0.76	0.13	ND	U		0.02	0.007	0.432	J	J	0.038	0.013	0.05	B	J	0.15	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	**0.154**			0.114	0.017	ND	U		0.15	0.02	0.52			0.15	0.03
MAK110C	1/14/2014	7.62			0.80	0.14	ND	U		0.02	0.007	0.395	J	J	0.040	0.014	0.08	B	J	0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	**0.198**			0.121	0.018	0.03	B	J	0.16	0.02	0.50			0.16	0.03
Seaweed (Limu kohu)																																														
Dry Season																																														
MAK001L/2L/26L	9/9/2013; 9/10/2013; 9/27/2013	22.8			0.81	0.14	ND	U		0.02	0.007	2.28			0.041	0.014	0.38			0.16	0.03	ND	U		0.09	0.03	0.03			0.02	0.007	**0.178**			0.122	0.018	0.04	B	J	0.16	0.02	0.42			0.16	0.03
MAK013L	9/18/2013	34.9			0.74	0.13	ND	U		0.02	0.006	2.37			0.037	0.013	0.45			0.15	0.03	ND	U		0.08	0.03	0.13			0.02	0.006	**0.230**			0.111	0.017	0.05	B	J	0.15	0.02	0.47			0.15	0.03
MAK016L/21L/27L	9/23/2013; 9/27/2013; 9/27/2013	41.1			0.81	0.14	ND	U		0.02	0.007	2.27			0.041	0.014	1.74			0.16	0.03	ND	U		0.09	0.03	0.04			0.02	0.007	**0.474**			0.122	0.018	0.10	B	J	0.16	0.02	0.50			0.16	0.03
MAK022L	9/27/2013	54.1			0.77	0.13	ND	U		0.02	0.007	1.89			0.038	0.013	0.67			0.15	0.03	ND	U		0.09	0.03	0.05			0.02	0.007	**0.349**			0.115	0.017	0.07	B	J	0.15	0.02	0.47			0.15	0.03
MAK023L	9/27/2013	31.2			0.79	0.14	0.01	B	J	0.02	0.007	2.20			0.040	0.014	0.49			0.16	0.03	ND	U		0.09	0.03	0.05			0.02	0.007	**0.172**			0.119	0.018	0.06	B	J	0.16	0.02	0.44			0.16	0.03
MAK024L/25L	9/27/2013; 9/27/2013	87.6			0.75	0.13	0.008	B	J	0.02	0.007	2.14			0.038	0.013	0.76			0.15	0.03	ND	U		0.08	0.03	0.06			0.02	0.007	**0.528**			0.113	0.017	0.09	B	J	0.15	0.02	0.51			0.15	0.03
MAK025L	9/27/2013	44.0			0.78	0.14	ND	U		0.02	0.007	1.97			0.039	0.014	4.49			0.16	0.03	ND	U		0.09	0.03	0.05			0.02	0.007	**0.260**			0.117	0.017	0.07	B	J	0.16	0.02	0.40			0.16	0.03
MAK029L	10/11/2013	20.9		J	0.77	0.14	ND	U		0.02	0.007	2.06			0.039	0.014	0.51			0.15	0.03	ND	U		0.09	0.03	0.03			0.02	0.007	**0.170**			0.116	0.017	0.03	B	J	0.15	0.02	0.46			0.15	0.03
Wet Season																																														
MAK101L	1/13/2014	25.0		J	0.75	0.13	0.01	B	J	0.02	0.007	2.17	J	J	0.037	0.013	1.66			0.15	0.03	ND	U		0.08	0.03	0.03			0.02	0.007	**0.128**			0.112	0.017	0.05	B	J	0.15	0.02	0.55			0.15	0.03
MAK102L	1/13/2014	367		J	0.81	0.14	0.01	B	J	0.02	0.007	2.29	J	J	0.040	0.014	1.54			0.16	0.03	ND	U		0.09	0.03	0.02	B		0.02	0.007	**2.58**			0.121	0.018	0.59			0.16	0.02	1.07			0.16	0.03
MAK105L	1/13/2014	26.3		J	0.79	0.14	0.009	B	J	0.02	0.007	2.01	J	J	0.039	0.014	0.89			0.16	0.03	ND	U		0.09	0.03	0.02	B		0.02	0.007	**0.337**			0.118	0.018	0.11	B	J	0.16	0.02	0.64			0.16	0.03
MAK106L	1/14/2014	26.2		J	0.75	0.13	0.01	B	J	0.02	0.007	1.82	J	J	0.037	0.013	0.33			0.15	0.03	ND	U		0.08	0.03	0.01	B	J	0.02	0.007	**0.244**			0.112	0.017	0.08	B	J	0.15	0.02	0.54			0.15	0.03
MAK108,109,110,113L	1/14/2014; 1/14/2014; 1/14/2014; 1/14/2014	411		J	0.80	0.14	0.02	B		0.02	0.007	2.50	J	J	0.040	0.014	1.46			0.16	0.03	ND	U		0.09	0.03	0.03			0.02	0.007	**2.52**			0.120	0.018	0.47			0.16	0.02	1.18			0.16	0.03
MAK111L	1/14/2014	299		J	0.81	0.14	0.01	B	J	0.02	0.007	2.17	J	J	0.041	0.014	1.45			0.16	0.03	ND	U		0.09	0.03	0.02	B		0.02	0.007	**2.00**			0.122	0.018	0.48			0.16	0.02	1.02			0.16	0.03
MAK112L	1/14/2014	438		J	0.80	0.14	ND	U		0.02	0.007	2.52	J	J	0.040	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	**3.06**			0.121	0.018	ND	U		0.16	0.02	ND	U		0.16	0.03
MAK115L	1/14/2014	26.5	M	J	0.77	0.14	0.01	B	J	0.02	0.007	1.75	J	J	0.039	0.014	0.96			0.15	0.03	ND	U		0.09	0.03	0.02	B		0.02	0.007	**0.146**			0.116	0.017	0.04	B	J	0.15	0.02	0.51			0.15	0.03

Draft

Table F-6a: Concentrations of Metals in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Aluminum					Antimony					Arsenic					Barium					Beryllium					Cadmium					Chromium					Cobalt					Copper				
CAS Number		7429-90-5					7440-36-0					7440-38-2					7440-39-3					7440-41-7					7440-43-9					7440-47-3					7440-48-4					7440-50-8				
Project Screening Values[1]		4,000					1.60					not defined					800					8.00					4.00					0.08					1.20					160				
Units		mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL
Mokulēʻia																																														
Octopus (Heʻe)																																														
Dry Season																																														
MAK009O	9/13/2013	0.71			0.68	0.12	ND	U		0.02	0.006	18.2			0.034	0.012	ND	U		0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND		U	0.102	0.015	ND	U		0.14	0.02	7.49			0.14	0.03
MAK010O	9/16/2013	0.29	B	J	0.72	0.13	ND	U		0.02	0.006	21.7	J		0.036	0.013	ND	U		0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.107	0.016	ND	U		0.14	0.02	7.25			0.14	0.03
MAK011O	9/16/2013	0.24	B	J	0.70	0.12	ND	U		0.02	0.006	22.8			0.035	0.012	ND	U		0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	U		0.106	0.016	ND	U		0.14	0.02	5.99			0.14	0.03
MAK015O	9/22/2013	0.56	B	J	0.79	0.14	ND	U		0.02	0.007	36.2			0.039	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	0.05			0.02	0.007	ND	U		0.118	0.018	ND	U		0.16	0.02	6.35			0.16	0.03
MAK016O	9/22/2013	4.27			0.74	0.13	ND	U		0.02	0.006	29.3			0.037	0.013	ND	U		0.15	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.111	0.017	ND	U		0.15	0.02	12.2			0.15	0.03
MAK017O	9/22/2013	0.66	B	J	0.74	0.13	ND	U		0.02	0.007	37.5			0.037	0.013	ND	U		0.15	0.03	ND	U		0.08	0.03	0.008	B	J	0.02	0.007	**0.388**			0.112	0.017	ND	U		0.15	0.02	8.89			0.15	0.03
MAK018O	9/22/2013	0.52	B	J	0.70	0.12	ND	U		0.02	0.006	40.3			0.035	0.012	ND	U		0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.105	0.016	ND	U		0.14	0.02	5.72			0.14	0.03
MAK024O	9/27/2013	0.29	B	J	0.70	0.12	ND	U		0.02	0.006	35.1			0.035	0.012	ND	U		0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.105	0.016	ND	U		0.14	0.02	4.13			0.14	0.03
Wet Season																																														
MAK109O	1/31/2014	ND	B	U	0.73	0.13	ND	U		0.018	0.006	30.7			0.036	0.013	ND	U		0.15	0.03	ND	U		0.082	0.027	0.029			0.018	0.006	0.023	B	J	0.109	0.016	ND	U		0.145	0.018	40.0	M	J	0.18	0.09
MAK118O	3/27/2014	ND		U	0.80	0.14	ND	U		0.020	0.007	46.2			0.040	0.014	ND	U		0.16	0.03	ND	U		0.090	0.030	0.037			0.020	0.007	ND	U		0.120	0.018	ND	U		0.160	0.020	6.47		J	0.20	0.10
MAK119O	3/27/2014	ND	B	U	0.77	0.13	ND	U		0.019	0.007	37.3			0.038	0.013	ND	U		0.15	0.03	ND	U		0.086	0.029	0.013	B	J	0.019	0.007	ND	U		0.115	0.017	ND	U		0.154	0.019	6.43		J	0.19	0.10
MAK120O	3/27/2014	ND	B	U	0.77	0.14	ND	U		0.019	0.007	39.0			0.039	0.014	ND	U		0.15	0.03	ND	U		0.087	0.029	0.011	B	J	0.019	0.007	ND	U		0.116	0.017	ND	U		0.155	0.019	6.29		J	0.19	0.10
MAK121O	3/27/2014	ND	B	U	0.77	0.14	ND	U		0.019	0.007	39.8			0.039	0.014	ND	U		0.15	0.03	ND	U		0.087	0.029	0.020			0.019	0.007	0.047	B	J	0.116	0.017	ND	U		0.155	0.019	4.39		J	0.19	0.10
MAK122O	3/27/2014	ND	B	U	0.78	0.14	ND	U		0.020	0.007	29.9			0.039	0.014	ND	U		0.16	0.03	ND	U		0.088	0.029	0.009	B	J	0.020	0.007	ND	U		0.117	0.018	ND	U		0.157	0.020	5.65		J	0.20	0.10
MAK123O	3/27/2014	ND	B	U	0.76	0.13	ND	U		0.019	0.007	28.2			0.038	0.013	ND	U		0.15	0.03	ND	U		0.085	0.028	0.021			0.019	0.007	0.025	B	J	0.114	0.017	ND	U		0.152	0.019	5.77		J	0.19	0.09
MAK124O	3/28/2014	ND	B	U	0.74	0.13	ND	U		0.019	0.007	37.0			0.037	0.013	ND	U		0.15	0.03	ND	U		0.084	0.028	0.012	B	J	0.019	0.007	ND	U		0.112	0.017	ND	U		0.149	0.019	5.27		J	0.19	0.09
Sea Cucumber (Loli)																																														
Dry Season																																														
MAK010C	9/13/2013	0.40	B	J	0.74	0.13	ND	U		0.02	0.006	0.584			0.037	0.013	0.07	B	J	0.15	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.111	0.017	ND	U		0.15	0.02	0.35			0.15	0.03
MAK014C	9/13/2013	0.86			0.71	0.12	ND	U		0.02	0.006	6.01			0.036	0.012	ND	U		0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.107	0.016	ND	U		0.14	0.02	11.2			0.14	0.03
MAK020C	9/16/2013	2.84			0.78	0.14	ND	U		0.02	0.007	8.71			0.039	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.117	0.018	ND	U		0.16	0.02	52.7			0.16	0.03
MAK022C	9/16/2013	0.35	B	J	0.74	0.13	ND	U		0.02	0.006	16.6			0.037	0.013	0.05	B	J	0.15	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.110	0.017	ND	U		0.15	0.02	0.60			0.15	0.03
MAK024C	9/22/2013	1.53			0.75	0.13	ND	U		0.02	0.007	0.700			0.038	0.013	0.05	B	J	0.15	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.113	0.017	ND	U		0.15	0.02	0.48			0.15	0.03
MAK025C	9/22/2013	0.61	B	J	0.80	0.14	ND	U		0.02	0.007	5.28			0.040	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.120	0.018	ND	U		0.16	0.02	4.09			0.16	0.03
MAK026C	9/22/2013	0.59	B	J	0.71	0.12	ND	U		0.02	0.006	0.526			0.035	0.012	0.05	B	J	0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.106	0.016	ND	U		0.142	0.02	0.35			0.14	0.03
MAK027C	9/22/2013	1.72			0.69	0.12	ND	U		0.02	0.006	0.483			0.034	0.012	0.07	B	J	0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.103	0.015	ND	U		0.14	0.02	0.44			0.14	0.03
Wet Season																																														
MAK111C	1/31/2014	4.40	M	J	0.80	0.14	ND	U		0.020	0.007	0.798			0.040	0.014	0.18			0.16	0.03	ND	U		0.090	0.030	ND	U		0.020	0.007	**0.596**			0.120	0.018	0.047	J3	J	0.160	0.020	0.45			0.16	0.03
MAK113C	1/31/2014	1.84		J	0.77	0.14	ND	U		0.019	0.007	0.844			0.039	0.014	0.10	J3	J	0.15	0.03	ND	U		0.087	0.029	ND	U		0.019	0.007	**0.191**			0.116	0.017	0.042	J3	J	0.155	0.019	0.50			0.15	0.03
MAK114C	1/31/2014	2.71		J	0.72	0.13	ND	U		0.018	0.006	0.911			0.036	0.013	0.10	J3	J	0.14	0.03	ND	U		0.081	0.027	ND	U		0.018	0.006	**0.159**			0.108	0.016	0.038	J3	J	0.144	0.018	0.47			0.14	0.03
MAK115C	1/31/2014	2.57		J	0.70	0.12	0.009	J3	J	0.018	0.006	1.38			0.035	0.012	0.07	J3	J	0.14	0.03	ND	U		0.079	0.026	ND	U		0.018	0.006	**0.181**			0.105	0.016	0.053	J3	J	0.140	0.018	0.39			0.14	0.03
MAK116C	1/31/2014	6.85		J	0.78	0.14	ND	U		0.019	0.007	1.00			0.039	0.014	0.24			0.16	0.03	ND	U		0.088	0.029	ND	U		0.019	0.007	**0.566**			0.117	0.018	0.056	J3	J	0.156	0.019	0.63			0.16	0.03
MAK117C	1/31/2014	11.4		J	0.76	0.13	ND	U		0.019	0.007	0.586			0.038	0.013	0.21			0.15	0.03	ND	U		0.085	0.028	ND	U		0.019	0.007	**0.224**			0.113	0.017	0.041	J3	J	0.151	0.019	0.56			0.15	0.03
MAK118C	1/31/2014	10.5		J	0.72	0.13	ND	U		0.018	0.006	1.32			0.036	0.013	0.12	J3	J	0.14	0.03	ND	U		0.081	0.027	ND	U		0.018	0.006	**0.119**			0.108	0.016	0.047	J3	J	0.144	0.018	0.49			0.14	0.03
MAK120C	2/11/2014	9.41		J	0.75	0.13	ND	U		0.019	0.007	0.396			0.038	0.013	0.11	J3	J	0.15	0.03	ND	U		0.085	0.028	ND	U		0.019	0.007	**0.152**			0.113	0.017	0.049	J3	J	0.151	0.019	0.42			0.15	0.03
Seaweed (Limu kohu)																																														
Dry Season																																														
MAK007L	9/16/2013	630	M	J	0.80	0.14	0.03	N	J	0.02	0.007	3.76			0.040	0.014	2.05			0.16	0.03	ND	U		0.09	0.03	0.09			0.02	0.007	**4.19**	M	J	0.120	0.018	0.32			0.16	0.02	0.87			0.16	0.03
MAK009L	9/16/2013	190			0.75	0.13	0.008	B	J	0.02	0.007	2.62			0.038	0.013	1.56			0.15	0.03	ND	U		0.08	0.03	0.05			0.02	0.007	**1.71**			0.113	0.017	0.13	B	J	0.15	0.02	0.55			0.15	0.03
MAK010L (comp)	9/16/2013	423			0.79	0.14	0.01	B	J	0.02	0.007	3.20			0.040	0.014	2.09			0.16	0.03	ND	U		0.09	0.03	0.08			0.02	0.007	**3.08**			0.119	0.018	0.23			0.16	0.02	0.66			0.16	0.03
MAK044L	10/15/2013	269			0.78	0.14	ND	U		0.02	0.007	2.15			0.039	0.014	1.33			0.16	0.03	ND	U		0.09	0.03	0.06			0.02	0.007	**2.01**			0.117	0.018	0.14	B	J	0.16	0.02	0.40			0.16	0.03
MAK045L	10/15/2013	117			0.79	0.14	ND	U		0.02	0.007	2.55			0.040	0.014	3.11			0.16	0.03	ND	U		0.09	0.03	0.04			0.02	0.007	**0.766**			0.119	0.018	0.09	B	J	0.16	0.02	0.41			0.16	0.03
MAK046L	10/15/2013	276			0.76	0.13	ND	U,N	UJ	0.02	0.007	2.21			0.038	0.013	1.95			0.15	0.03	ND	U		0.09	0.03	0.06			0.02	0.007	**2.34**			0.113	0.017	0.16			0.15	0.02	0.49			0.15	0.03
MAK047L	10/15/2013	397			0.73	0.13	0.02	B		0.02	0.006	2.14			0.037	0.013	1.77			0.15	0.03	ND	U		0.08	0.03	0.03			0.02	0.006	**1.93**			0.110	0.017	0.21			0.15	0.02	0.66			0.15	0.03
MAK049L	10/15/2013	448			0.76	0.13	0.01	B	J	0.02	0.007	2.68			0.038	0.013	1.40			0.15	0.03	ND	U		0.09	0.03	0.04			0.02	0.007	**2.04**			0.114	0.017	0.21			0.15	0.02	0.83			0.15	0.03
Wet Season																																														
MAK120L	1/31/2014	290			0.74	0.13	0.020			0.018	0.006	3.12			0.037	0.013	3.59		J	0.15	0.03	ND	U		0.083	0.028	0.025			0.018	0.006	**1.41**			0.111	0.017	0.185			0.148	0.018	0.73			0.15	0.03
MAK121L	1/31/2014	152			0.77	0.13	0.015	J3	J	0.019	0.007	2.17			0.038	0.013	1.46		J	0.15	0.03	ND	U		0.086	0.029	0.031			0.019	0.007	**0.963**			0.115	0.017	0.090	J3	J	0.154	0.019	0.63			0.15	0.03
MAK122L	1/31/2014	71.9			0.75	0.13	0.014	J3	J	0.019	0.007	2.03			0.038	0.013	34.9	M	J	0.15	0.03	ND	U		0.085	0.028	0.038			0.019	0.007	**0.534**	M		0.113	0.017	0.111	J3	J	0.151	0.019	0.53			0.15	0.03
MAK123L	1/31/2014	55.0			0.78	0.14	0.015	J3	J	0.020	0.007	1.85			0.039	0.014	2.84		J	0.16	0.03	ND	U		0.088	0.029	0.042			0.020	0.007	**0.301**			0.117	0.018	0.080	J3	J	0.157	0.020	0.48			0.16	0.03
MAK124L	1/31/2014	543			0.78	0.14	0.028			0.020	0.007	2.25			0.039	0.014	22.8		J	0.16	0.03	ND	U		0.088	0.029	0.016	J3	J	0.020	0.007	**2.48**			0.117	0.018	0.325			0.157	0.020	1.04			0.16	0.03
MAK126L	1/31/2014	838			0.78	0.14	0.022			0.020	0.007	2.64			0.039	0.014	3.94		J	0.16	0.03	ND	U		0.088	0.029	0.026			0.020	0.007	**3.65**			0.118	0.018	0.523			0.157	0.020	1.17			0.16	0.03
MAK127L	2/11/2014	71.9			0.78	0.14	0.011	J3	J	0.019	0.007	1.64			0.039	0.014	1.96		J	0.16	0.03	ND	U		0.087	0.029	0.037			0.019	0.007	**0.571**			0.117	0.017	0.066	J3	J	0.155	0.019	0.51			0.16	0.03
MAK128L	2/11/2014	45.7			0.76	0.13	0.009	J3	J	0.019	0.007	1.55			0.038	0.013	1.58		J	0.15	0.03	ND	U		0.086	0.029	0.027			0.019	0.007	**0.319**			0.114	0.017	0.047	J3	J	0.152	0.019	0.47			0.15	0.03

Draft

Table F-6a: Concentrations of Metals in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Aluminum					Antimony					Arsenic					Barium					Beryllium					Cadmium					Chromium					Cobalt					Copper				
CAS Number		*7429-90-5*					*7440-36-0*					*7440-38-2*					*7440-39-3*					*7440-41-7*					*7440-43-9*					*7440-47-3*					*7440-48-4*					*7440-50-8*				
Project Screening Values[1]		*4,000*					*1.60*					*not defined*					*800*					*8.00*					*4.00*					*0.08*					*1.20*					*160*				
Units		*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**
Ka'ena Point																																														
Octopus (He'e)																																														
Dry Season																																														
MAK012O	9/22/2013	0.76	B		0.76	0.13	ND	U		0.02	0.007	21.8			0.038	0.013	ND	U		0.15	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	**0.192**			0.115	0.017	ND	U		0.15	0.02	5.49			0.15	0.03
MAK013O	9/22/2013	0.97			0.74	0.13	ND	U		0.02	0.006	28.0			0.037	0.013	ND	U		0.15	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND		U	0.111	0.017	ND	U		0.15	0.02	8.00			0.15	0.03
MAK014O	9/23/2013	0.63	B	J	0.68	0.12	ND	U		0.02	0.006	29.8			0.034	0.012	ND	U		0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.101	0.015	ND	U		0.14	0.02	6.80			0.14	0.03
MAK019O	9/23/2013	0.16	B	J	0.75	0.13	ND	U		0.02	0.007	23.7			0.037	0.013	ND	U		0.15	0.03	ND	U		0.08	0.03	0.02	B	J	0.02	0.007	ND		U	0.112	0.017	ND	U		0.15	0.02	4.68			0.15	0.03
MAK020O	9/23/2013	ND	U		0.76	0.13	ND	U		0.02	0.007	24.8			0.038	0.013	ND	U		0.15	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.114	0.017	ND	U		0.15	0.02	10.7			0.15	0.03
MAK021O	9/23/2013	0.19	B	J	0.78	0.14	ND	U		0.02	0.007	23.7			0.039	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	0.01	B	J	0.02	0.007	ND	B	U	0.117	0.018	ND	U		0.16	0.02	3.63			0.16	0.03
MAK022O	9/23/2013	0.57	B	J	0.80	0.14	ND	U		0.02	0.007	26.8			0.040	0.014	ND	U		0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.119	0.018	ND	U		0.16	0.02	5.73			0.16	0.03
MAK023O	9/23/2013	0.23	B	J	0.69	0.12	0.01	B	J	0.02	0.006	26.3			0.034	0.012	ND	U		0.14	0.03	ND	U		0.08	0.03	0.007	B	J	0.02	0.006	ND	U		0.103	0.015	ND	U		0.14	0.02	4.28			0.14	0.03
Wet Season																																														
MAK110O	3/28/2014	ND		U	0.78	0.14	ND	U		0.020	0.007	25.1			0.039	0.014	ND	U		0.16	0.03	ND	U		0.088	0.029	0.008	B	J	0.020	0.007	ND	U		0.118	0.018	ND	U		0.157	0.020	7.36		J	0.20	0.10
MAK111O	3/28/2014	ND		U	0.74	0.13	ND	U		0.018	0.006	32.2			0.037	0.013	ND	U		0.15	0.03	ND	U		0.083	0.028	0.026			0.018	0.006	**0.108**	B	J	0.110	0.017	ND	U		0.147	0.018	15.3		J	0.18	0.09
MAK112O	3/28/2014	ND		U	0.75	0.13	ND	U		0.019	0.007	29.3			0.038	0.013	ND	U		0.15	0.03	ND	U		0.085	0.028	0.017	B	J	0.019	0.007	ND	U		0.113	0.017	ND	U		0.151	0.019	6.50		J	0.19	0.09
MAK113O	3/28/2014	ND	B	U	0.79	0.14	ND	U		0.020	0.007	28.9			0.040	0.014	ND	U		0.16	0.03	ND	U		0.089	0.030	0.008	B	J	0.020	0.007	**0.249**			0.119	0.018	ND	U		0.159	0.020	4.49		J	0.20	0.10
MAK114O	3/28/2014	ND		U	0.79	0.14	ND	U		0.020	0.007	35.8			0.039	0.014	ND	U		0.16	0.03	ND	U		0.089	0.030	0.010	B	J	0.020	0.007	**0.202**			0.118	0.018	ND	U		0.157	0.020	5.87		J	0.20	0.10
MAK115O	3/28/2014	ND	U		0.74	0.13	ND	U		0.019	0.006	36.1			0.037	0.013	ND	U		0.15	0.03	ND	U		0.083	0.028	ND	U		0.019	0.006	ND	U		0.111	0.017	ND	U		0.148	0.019	7.06		J	0.19	0.09
MAK116O	3/28/2014	ND	B	U	0.75	0.13	ND	U		0.019	0.007	31.9			0.037	0.013	ND	U		0.15	0.03	ND	U		0.084	0.028	0.014	B	J	0.019	0.007	ND	U		0.112	0.017	ND	U		0.149	0.019	6.64		J	0.19	0.09
MAK117O	3/28/2014	ND	B	U	0.72	0.13	ND	U		0.018	0.006	29.4			0.036	0.013	ND	U		0.14	0.03	ND	U		0.082	0.027	0.070			0.018	0.006	0.017	B	J	0.109	0.016	ND	U		0.145	0.018	6.71		J	0.18	0.09
Sea Cucumber (Loli)																																														
Dry Season																																														
MAK015C	9/13/2013	1.64			0.77	0.14	ND	U		0.02	0.007	11.6			0.039	0.014	ND	U		0.15	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.116	0.017	0.04	B	J	0.15	0.02	0.49			0.15	0.03
MAK018C	9/16/2013	0.38	B	J	0.73	0.13	ND	U		0.02	0.006	18.4			0.036	0.013	ND	U		0.15	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.109	0.016	ND	U		0.15	0.02	0.44			0.15	0.03
MAK019C	9/16/2013	0.29	B	J	0.73	0.13	ND	U		0.02	0.006	18.5			0.036	0.013	ND	U		0.15	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.109	0.016	ND	U		0.15	0.02	12.4			0.15	0.03
MAK028C	9/22/2013	0.95			0.86	0.15	ND	U		0.02	0.008	0.380			0.043	0.015	0.07	B	J	0.17	0.03	ND	U		0.10	0.03	ND	U		0.02	0.008	ND	B	U	0.129	0.019	ND	U		0.17	0.02	0.50			0.17	0.03
MAK029C	9/23/2013	0.60	B	J	0.72	0.13	ND	U		0.02	0.006	0.516			0.036	0.013	0.08	B	J	0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND	B	U	0.108	0.016	ND	U		0.14	0.02	3.21			0.14	0.03
MAK030C	9/23/2013	0.22	B	J	0.80	0.14	ND	U		0.02	0.007	0.508			0.040	0.014	0.04	B	J	0.16	0.03	ND	U		0.09	0.03	ND	U		0.02	0.007	ND	B	U	0.120	0.018	ND	U		0.16	0.02	0.95	M,N	J	0.16	0.03
MAK031C	9/23/2013	2.75			0.75	0.13	ND	U		0.02	0.007	0.688			0.037	0.013	0.06	B	J	0.15	0.03	ND	U		0.08	0.03	ND	U		0.02	0.007	ND	B	U	0.112	0.017	ND	U		0.15	0.02	0.51			0.15	0.03
MAK032C	9/23/2013	0.55	B	J	0.70	0.12	ND	U		0.02	0.006	0.477			0.035	0.012	0.06	B	J	0.14	0.03	ND	U		0.08	0.03	ND	U		0.02	0.006	ND		U	0.105	0.016	ND	U		0.14	0.02	0.40			0.14	0.03
Wet Season																																														
MAK121C	3/28/2014	ND	B	U	0.76	0.13	ND	U		0.019	0.007	0.374			0.038	0.013	0.04	B	J	0.15	0.03	ND	U		0.086	0.029	ND	U		0.019	0.007	0.046	B	J	0.115	0.017	ND	U		0.153	0.019	0.47			0.19	0.10
MAK122C	3/28/2014	2.58			0.76	0.13	ND	U		0.019	0.007	0.544			0.038	0.013	0.12	B	J	0.15	0.03	ND	U		0.086	0.029	ND	U		0.019	0.007	**0.199**			0.114	0.017	ND	U		0.152	0.019	0.72			0.19	0.10
MAK123C	3/28/2014	ND		U	0.74	0.13	ND	U		0.018	0.006	0.525			0.037	0.013	0.08	B	J	0.15	0.03	ND	U		0.083	0.028	ND	U		0.018	0.006	**0.157**			0.110	0.017	ND	U		0.147	0.018	38.9			0.18	0.09
MAK124C	3/28/2014	24.3			0.76	0.13	ND	U		0.019	0.007	0.852			0.038	0.013	0.28			0.15	0.03	ND	U		0.086	0.029	ND	U		0.019	0.007	**0.243**			0.114	0.017	0.031	B	J	0.152	0.019	0.48			0.19	0.10
MAK125C	3/28/2014	8.78			0.76	0.13	ND	U		0.019	0.007	0.671			0.038	0.013	0.21			0.15	0.03	ND	U		0.086	0.029	ND	U		0.019	0.007	**0.317**			0.114	0.017	0.064	B	J	0.152	0.019	0.58			0.19	0.10
MAK126C	3/28/2014	13.5			0.75	0.13	ND	U		0.019	0.007	0.687			0.037	0.013	0.20			0.15	0.03	ND	U		0.084	0.028	0.034			0.019	0.007	**0.270**			0.112	0.017	0.044	B	J	0.150	0.019	0.59			0.19	0.09
MAK127C	3/28/2014	14.2			0.78	0.14	ND	U		0.019	0.007	1.11			0.039	0.014	0.21			0.16	0.03	ND	U		0.087	0.029	ND	U		0.019	0.007	**0.266**			0.116	0.017	0.068	B	J	0.155	0.019	0.36			0.19	0.10
MAK128C	3/28/2014	3.99			0.73	0.13	ND	U		0.018	0.006	0.514			0.037	0.013	0.14	B	J	0.15	0.03	ND	U		0.082	0.027	ND	U		0.018	0.006	**0.148**			0.110	0.016	0.019	B	J	0.147	0.018	0.39			0.18	0.09
Seaweed (Limu kohu)																																														
Dry Season																																														
MAK011L	9/16/2013	31.6			0.79	0.14	ND	U		0.02	0.007	2.25			0.039	0.014	0.44			0.16	0.03	ND	U		0.09	0.03	0.07			0.02	0.007	**0.164**			0.118	0.018	0.05	B	J	0.16	0.02	0.43			0.16	0.03
MAK030L	10/11/2013	156			0.77	0.13	ND	U		0.02	0.007	1.93			0.038	0.013	1.06			0.15	0.03	ND	U		0.09	0.03	0.06			0.02	0.007	**1.40**			0.115	0.017	0.16			0.15	0.02	0.41			0.15	0.03
MAK033L	10/11/2013	240			0.78	0.14	0.008	B	J	0.02	0.007	2.72			0.039	0.014	1.65			0.16	0.03	ND	U		0.09	0.03	0.07			0.02	0.007	**1.55**			0.117	0.018	0.17			0.16	0.02	0.71			0.16	0.03
MAK034L	10/11/2013	222			0.77	0.13	ND	U		0.02	0.007	2.29			0.038	0.013	1.26			0.15	0.03	ND	U		0.09	0.03	0.07			0.02	0.007	**1.43**			0.115	0.017	0.16			0.15	0.02	0.57			0.15	0.03
MAK038L	10/11/2013	273			0.74	0.13	0.02	B		0.02	0.006	2.06			0.037	0.013	1.52			0.15	0.03	ND	U		0.08	0.03	0.05			0.02	0.006	**2.10**			0.111	0.017	0.35			0.15	0.02	0.56			0.15	0.03
MAK041L	10/11/2013	204			0.79	0.14	0.008	B	J	0.02	0.007	1.80			0.040	0.014	0.79			0.16	0.03	ND	U		0.09	0.03	0.08			0.02	0.007	**1.34**			0.119	0.018	0.16	B		0.16	0.02	0.54			0.16	0.03
MAK042L	10/11/2013	245			0.79	0.14	0.008	B	J	0.02	0.007	1.93			0.040	0.014	0.94			0.16	0.03	ND	U		0.09	0.03	0.08			0.02	0.007	**1.66**			0.119	0.018	0.19			0.16	0.02	0.67			0.16	0.03
MAK043L	10/11/2013	334			0.83	0.15	0.009	B	J	0.02	0.007	2.20			0.042	0.015	1.12			0.17	0.03	ND	U		0.09	0.03	0.08			0.02	0.007	**2.24**			0.125	0.019	0.22			0.17	0.02	0.73			0.17	0.03
Wet Season																																														
MAK116L	1/31/2014	77.2			0.71	0.12	0.011	J3	J	0.018	0.006	1.57			0.035	0.012	0.37		J	0.14	0.03	ND	U		0.080	0.027	0.039			0.018	0.006	**0.484**			0.106	0.016	0.132	J3	J	0.142	0.018	0.56			0.14	0.03
MAK117L	1/31/2014	123			0.68	0.12	0.011	J3	J	0.017	0.006	1.56			0.034	0.012	0.81		J	0.14	0.03	ND	U		0.076	0.025	0.042			0.017	0.006	**0.479**			0.101	0.015	0.131	J3	J	0.135	0.017	0.73			0.14	0.03
MAK118L	1/31/2014	21.1			0.77	0.14	ND	U		0.019	0.007	1.20			0.039	0.014	1.91		J	0.15	0.03	ND	U		0.087	0.029	0.021			0.019	0.007	**0.081**	J3	J	0.116	0.017	0.037	J3	J	0.154	0.019	0.35			0.15	0.03
MAK130L	3/27/2014	151			0.80	0.14	0.009	B	J	0.020	0.007	1.70			0.040	0.014	5.39		J	0.16	0.03	ND	U		0.089	0.030	0.039			0.020	0.007	**1.14**			0.119	0.018	0.128	B	J	0.159	0.020	0.51			0.20	0.10
MAK132L	3/28/2014	138			0.79	0.14	0.009	B	J	0.020	0.007	1.54			0.040	0.014	2.22		J	0.16	0.03	ND	U		0.089	0.030	0.046			0.020	0.007	**0.938**			0.119	0.018	0.089	B	J	0.159	0.020	0.55			0.20	0.10
MAK134L	3/28/2014	72.0			0.78	0.14	ND	U		0.020	0.007	1.25			0.039	0.014	1.17		J	0.16	0.03	ND	U		0.088	0.029	0.033			0.020	0.007	**0.506**			0.117	0.018	0.065	B	J	0.157	0.020	0.46			0.20	0.10
MAK135L	3/28/2014	74.1			0.77	0.14	ND	U		0.019	0.007	1.35			0.039	0.014	1.03		J	0.15	0.03	ND	U		0.087	0.029	0.053			0.019	0.007	**0.634**			0.116	0.017	0.055	B	J	0.154	0.019	0.44			0.19	0.10
MAK138L	3/28/2014	164			0.75	0.13	0.010	B	J	0.019	0.007	1.68			0.037	0.013	4.73		J	0.15	0.03	ND	U		0.084	0.028	0.052			0.019	0.007	**1.03**			0.112	0.017	0.149	B		0.149	0.019	0.48			0.19	0.09

Notes:

Bold results exceed the project screening values.

[1] Final screening values from fish advisories as listed in Table 9 of the *Final Supplemental Marine Resources Study Sampling and Analysis Plan* (August 2013).

[2] In the the Brooks Rand Lab laboratory reports, ND values are presented as the MDL with a "U" qualifier. In this table these results are presented as "ND" with a "U" LQ.

[3] For this result, the LQ is presented as "B" in the Brooks Rand Lab laboratory report but is reported as "J" in the Staged Electronic Data Deliverable file and thus in this table.

CAS - Chemical Abstracts Service

ID - identification

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Table F-6a: Concentrations of Metals in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Aluminum					Antimony					Arsenic					Barium					Beryllium					Cadmium					Chromium					Cobalt					Copper				
CAS Number		*7429-90-5*					*7440-36-0*					*7440-38-2*					*7440-39-3*					*7440-41-7*					*7440-43-9*					*7440-47-3*					*7440-48-4*					*7440-50-8*				
Project Screening Values[1]		*4,000*					*1.60*					*not defined*					*800*					*8.00*					*4.00*					*0.08*					*1.20*					*160*				
Units		*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL

MDL - method detection limit

mg/kg-wet - milligrams per kilogram-wet weight

ND - not detected

RL - reporting limit

Laboratory qualifier (LQ)

[B] - Detected by the instrument, the result is greater than the MDL but less than or equal to the RL. Result is reported and considered an estimate.

[J] - Estimated value. A full explanation is presented in the Brooks Rand Lab laboratory reports case narratives.

[M] - Duplicate precision (relative percent difference) was not within acceptance criteria. Result is estimated.

[N] - Spike recovery was not within acceptance criteria. Result is estimated.

[U] - Result is less than or equal to the MDL or client requested reporting limit (CRRL). Result is reported as the MDL or CRRL.

Validator qualifier (VQ)

[J] - Indicates an estimated value.

[U] - Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

[UJ] - Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

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Table F-6b: Concentrations of Metals in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Iron					Lead					Manganese					Mercury					Methyl Mercury					Selenium					Silver					Thallium					Vanadium					Zinc				
CAS Number		7439-89-6					7439-92-1					7439-96-5					7439-97-6					22967-92-6					7782-49-2					7440-22-4					7440-28-0					7440-62-2					7440-66-6				
Project Screening Values[1]		2,800					not defined					560					1,200					400					20					20					0.04					20					1,200				
Units		mg/kg-wet					mg/kg-wet					mg/kg-wet					ng/g-wet					ng/g-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL
Mākua																																																				
Octopus (He'e)																																																				
Dry Season																																																				
MAK001O	9/9/2013	ND		U	0.806	0.081	0.08			0.04	0.004	0.18			0.04	0.01	10.5			1.91	0.57	7.86			2.84	0.95	0.283			0.151	0.060	ND	U,J	UJ	0.10	0.02	ND	U		0.008	0.002	ND	U		0.121	0.014	13.2			1.01	0.20
MAK002O	9/9/2013	ND		U	0.685	0.068	0.004	B	J	0.03	0.003	0.19			0.03	0.01	6.19			1.80	0.54	5.35			2.78	0.93	0.159			0.128	0.051	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.103	0.012	9.90			0.86	0.17
MAK003O	9/9/2013	ND		U	0.714	0.071	0.36			0.04	0.004	0.27			0.04	0.01	6.34			1.96	0.59	5.59			2.61	0.87	0.241			0.134	0.054	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.107	0.012	14.1			0.89	0.18
MAK004O	9/11/2013	ND		U	0.714	0.071	0.005	B	J	0.04	0.004	0.23			0.04	0.01	10.3			1.79	0.54	7.17			2.75	0.92	0.210			0.134	0.054	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.107	0.012	11.3			0.89	0.18
MAK005O	9/11/2013	ND		U	0.792	0.079	0.007	B	J	0.04	0.004	0.24			0.04	0.01	10.4			1.74	0.52	9.52			2.82	0.94	0.243			0.149	0.059	ND	U,J	UJ	0.10	0.02	ND	U		0.008	0.002	ND	U		0.119	0.014	12.0			0.99	0.20
MAK006O	9/11/2013	ND		U	0.734	0.073	0.007	B	J	0.04	0.004	0.24			0.04	0.01	17.4			1.95	0.58	11.4			3.88	1.29	0.264			0.138	0.055	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.110	0.013	12.4			0.92	0.18
MAK007O	9/11/2013	ND	M,N	UJ	0.802	0.080	0.007	B	J	0.04	0.004	0.29			0.04	0.01	11.8			1.93	0.58	11.2			4.30	1.43	0.294			0.150	0.060	ND	U,J	UJ	0.10	0.02	ND	U		0.008	0.002	ND	U		0.120	0.014	12.2			1.00	0.20
MAK008O	9/11/2013	ND		U	0.803	0.080	0.01	B	J	0.04	0.004	0.22			0.04	0.01	9.29			1.94	0.58	7.36			4.11	1.37	0.244			0.151	0.060	ND	U,J	UJ	0.10	0.02	ND	U		0.008	0.002	ND	U		0.120	0.014	10.9			1.00	0.20
Wet Season																																																				
MAK101O	1/13/2014	1.19			0.771	0.077	0.03	B	J	0.04	0.004	0.40			0.04	0.01	13.1			0.36	0.11	12.0			3.29	1.10	0.256			0.145	0.058	ND	U		0.10	0.02	ND	U		0.008	0.002	ND	U		0.116	0.013	16.2			0.96	0.19
MAK102O	1/13/2014	1.13			0.791	0.079	0.02	B	J	0.04	0.004	0.25			0.04	0.01	8.41			0.40	0.12	7.99			2.75	0.92	0.241			0.148	0.059	ND	U		0.10	0.02	ND	U		0.008	0.002	ND	U		0.119	0.014	14.7			0.99	0.20
MAK103O	1/13/2014	1.36			0.763	0.076	0.007	B	J	0.04	0.004	0.30			0.04	0.01	12.2			0.42	0.13	9.27			3.19	1.06	0.300			0.143	0.057	ND	U		0.10	0.02	ND	U		0.008	0.002	ND	U		0.115	0.013	13.7			0.95	0.19
MAK104O	1/13/2014	1.34			0.758	0.076	0.05			0.04	0.004	0.42			0.04	0.01	14.9			0.40	0.12	14.1			3.04	1.01	0.311			0.142	0.057	ND	U		0.09	0.02	ND	U		0.008	0.002	ND	U		0.114	0.013	15.1			0.95	0.19
MAK105O	1/13/2014	2.78			0.781	0.078	0.03	B	J	0.04	0.004	0.29			0.04	0.01	12.7			0.43	0.13	12.3			3.15	1.05	0.318			0.146	0.059	ND	U		0.10	0.02	ND	U		0.008	0.002	ND	U		0.117	0.014	14.2			0.98	0.20
MAK106O	1/13/2014	0.949			0.769	0.077	0.02	B	J	0.04	0.004	0.26			0.04	0.01	18.7			0.42	0.13	15.9			2.90	0.97	0.296			0.144	0.058	ND	U		0.10	0.02	ND	U		0.008	0.002	ND	U		0.115	0.013	15.1			0.96	0.19
MAK107O	1/13/2014	1.73			0.762	0.076	0.02	B	J	0.04	0.004	0.25			0.04	0.01	17.7			0.42	0.12	14.5			3.19	1.06	0.288			0.143	0.057	ND	U		0.10	0.02	ND	U		0.008	0.002	ND	U		0.114	0.013	16.2			0.95	0.19
MAK108O	1/13/2014	0.901			0.783	0.078	0.03	B	J	0.04	0.004	0.22			0.04	0.01	9.82			0.39	0.12	9.60			3.06	1.02	0.267			0.147	0.059	ND	U		0.10	0.02	ND	U		0.008	0.002	ND	U		0.117	0.014	15.0			0.98	0.20
Sea Cucumber (Loli)																																																				
Dry Season																																																				
MAK001C	9/9/2013	4.18			0.748	0.075	0.03	B	J	0.04	0.004	0.24			0.04	0.01	0.18	J3	J	0.38	0.12	ND		U	2.89	0.96	0.266			0.140	0.056	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	0.036	B	J	0.112	0.013	ND	B	U	0.93	0.19
MAK002C	9/9/2013	4.73			0.787	0.079	0.03	B	J	0.04	0.004	ND		U	0.04	0.01	0.29	J3	J	0.37	0.11	ND		U	2.78	0.93	0.295			0.148	0.057	ND	U,J	UJ	0.10	0.02	ND	U		0.008	0.002	0.023	B	J	0.118	0.014	ND	B	U	0.98	0.20
MAK004C	9/9/2013	ND		U	0.742	0.074	0.12			0.04	0.004	ND		U	0.04	0.01	0.35	J3	J	0.32	0.10	ND		U	2.67	0.89	0.331			0.139	0.056	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	0.028	B	J	0.111	0.013	1.43			0.93	0.19
MAK005C	9/9/2013	ND		U	0.777	0.078	0.02	B	J	0.04	0.004	ND		U	0.04	0.01	0.22	J3	J	0.39	0.12	ND		U	2.92	0.97	0.178			0.146	0.058	ND	U,J	UJ	0.10	0.02	ND	U		0.008	0.002	0.023	B	J	0.117	0.014	ND	B	U	0.97	0.19
MAK006C	9/11/2013	19.8			0.795	0.080	0.02	B	J	0.04	0.004	0.39			0.04	0.01	0.32	J3	J	0.38	0.11	ND		U	2.73	0.91	0.318			0.149	0.060	ND	U,J	UJ	0.10	0.02	ND	U		0.008	0.002	0.077	B	J	0.119	0.014	ND	B	U	0.99	0.20
MAK007C	9/11/2013	5.35			0.714	0.071	0.45			0.04	0.004	0.20			0.04	0.01	0.39	J3		0.39	0.12	ND		U	2.72	0.91	0.295			0.134	0.054	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	0.035	B	J	0.107	0.012	5.63			0.89	0.18
MAK008C	9/11/2013	9.29			0.709	0.071	0.04	B		0.04	0.004	0.19			0.04	0.01	0.27	J3	J	0.39	0.12	ND		U	2.98	0.99	0.267			0.133	0.053	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	0.035	B	J	0.106	0.012	ND	B	U	0.89	0.18
MAK009C	9/11/2013	ND		U	0.750	0.75	0.02	B	J	0.04	0.004	ND		U	0.04	0.01	0.25	J3	J	0.38	0.11	ND		U	2.61	0.87	0.329			0.141	0.056	ND	U,J	UJ	0.09	0.02	ND	U		0.008	0.002	0.018	B	J	0.113	0.013	ND	B	U	0.94	0.19
Wet Season																																																				
MAK102C	1/13/2014	2.66			0.798	0.080	0.07			0.04	0.004	0.21			0.04	0.01	0.16	B	J	0.43	0.13	ND		U	2.84	0.95	0.352			0.150	0.060	ND	U		0.10	0.02	ND	U		0.008	0.002	0.024	B	J	0.120	0.014	ND	B	U	1.00	0.20
MAK103C	1/13/2014	23.2			0.769	0.077	0.04	B		0.04	0.004	0.40			0.04	0.01	0.26	B	J	0.43	0.13	ND		U,N	3.14	1.05	0.349			0.144	0.058	ND	U		0.10	0.02	ND	U		0.008	0.002	0.101	B	J	0.115	0.013	ND		U	0.96	0.19
MAK104C	1/13/2014	7.32			0.786	0.079	0.03	B	J	0.04	0.004	0.21			0.04	0.01	0.43			0.37	0.11	ND		U	3.18	1.06	0.388			0.147	0.059	ND	U		0.10	0.02	ND	U		0.008	0.002	0.038	B	J	0.118	0.014	ND	B	U	0.98	0.20
MAK105C	1/13/2014	4.58	M	J	0.805	0.080	0.06			0.04	0.004	0.18			0.04	0.01	0.32	B	J	0.43	0.13	ND		U	2.81	0.94	0.261			0.151	0.060	ND	U		0.10	0.02	ND	U		0.008	0.002	0.037	B	J	0.121	0.014	ND	B	U	1.01	0.20
MAK106C	1/13/2014	29.1			0.768	0.077	0.09			0.04	0.004	0.71			0.04	0.01	0.37	B	J	0.41	0.12	ND		U	2.80	0.93	0.574			0.144	0.058	ND	U		0.10	0.02	ND	U		0.008	0.002	0.099	B	J	0.115	0.013	ND		U	0.96	0.19
MAK107C	1/13/2014	17.1			0.806	0.081	0.27			0.04	0.004	0.43			0.04	0.01	0.19	B	J	0.41	0.12	ND		U	3.30	1.10	0.362			0.151	0.060	ND	U		0.10	0.02	ND	U		0.008	0.002	0.075	B	J	0.121	0.014	20.3			1.01	0.20
MAK108C	1/13/2014	9.23			0.762	0.076	0.05			0.04	0.004	0.20			0.04	0.01	0.17	B	J	0.40	0.12	ND		U	3.09	1.03	0.258			0.143	0.057	ND	U		0.10	0.02	ND	U		0.008	0.002	0.067	B	J	0.114	0.013	ND	B	U	0.95	0.19
MAK110C	1/14/2014	18.4			0.805	0.080	0.06			0.04	0.004	0.53			0.04	0.01	0.31	B	J	0.44	0.13	ND		U	3.06	1.02	0.238			0.151	0.060	ND	U		0.10	0.02	ND	U		0.008	0.002	0.062	B	J	0.121	0.014	ND	B	U	1.01	0.20
Seaweed (Limu kohu)																																																				
Dry Season																																																				
MAK001L/2L/26L	9/9/2013; 9/10/2013; 9/27/2013	37.0			0.815	0.081	0.37			0.04	0.004	1.26			0.04	0.01	2.27			0.80	0.24	1.01	B	J	2.94	0.98	ND		U	0.153	0.061	ND	U,J	UJ	0.10	0.02	0.007	B	J	0.008	0.002	1.21			0.122	0.014	3.48			1.02	0.20
MAK013L	9/18/2013	58.4			0.739	0.074	0.29			0.04	0.004	1.69			0.04	0.01	2.14			0.80	0.24	ND		U	2.93	0.98	ND		U	0.139	0.055	ND	U,J	UJ	0.09	0.02	0.007	B		0.007	0.002	1.29			0.111	0.013	2.23			0.92	0.18
MAK016L/21L/27L	9/23/2013; 9/27/2013; 9/27/2013	121			0.811	0.081	0.40			0.04	0.004	2.97			0.04	0.01	1.71			0.80	0.24	ND		U	2.98	0.99	ND		U	0.152	0.061	ND	U,J	UJ	0.10	0.02	0.004	B	J	0.008	0.002	2.21			0.122	0.014	2.08			1.01	0.20
MAK022L	9/27/2013	84.4			0.766	0.077	0.51			0.04	0.004	2.63			0.04	0.01	2.01			0.79	0.24	ND		U	2.78	0.93	ND		U	0.144	0.057	ND	U,J	UJ	0.10	0.02	0.004	B	J	0.008	0.002	2.41			0.115	0.013	2.01			0.96	0.19
MAK023L	9/27/2013	51.9			0.792	0.079	0.19			0.04	0.004	1.65			0.04	0.01	2.02			0.76	0.23	ND		U	2.68	0.89	ND		U	0.149	0.059	ND	U,J	UJ	0.10	0.02	0.005	B	J	0.008	0.002	1.25			0.119	0.014	2.21			0.99	0.20
MAK024L/25L	9/27/2013; 9/27/2013	137			0.750	0.075	0.63			0.04	0.004	3.07			0.04	0.01	2.04			0.80	0.24	ND		U	2.70	0.90	ND		U	0.141	0.056	ND	U,J	UJ	0.09	0.02	0.005	B	J	0.008	0.002	1.65			0.113	0.013	2.04			0.94	0.19
MAK025L	9/27/2013	69.8			0.777	0.078	0.37			0.04	0.004	1.91			0.04	0.01	1.94			0.79	0.24	ND		U,N	2.90	0.97	ND		U	0.146	0.058	ND	U,J	UJ	0.10	0.02	0.003	B	J	0.008	0.002	2.55			0.117	0.014	1.84			0.97	0.19
MAK029L	10/11/2013	38.8		J	0.774	0.077	0.13			0.04	0.004	1.12		J	0.04	0.01	2.05			0.80	0.24	ND		U	2.96	0.99	ND		U	0.145	0.058	ND	U,J	UJ	0.10	0.02	0.004	B	J	0.008	0.002	0.976			0.116	0.014	1.87			0.97	0.19
Wet Season																																																				
MAK101L	1/13/2014	36.9		J	0.749	0.075	0.16			0.04	0.004	1.25		J	0.04	0.01	2.43			0.42	0.13	ND		U	3.32	1.11	ND		U	0.140	0.056	ND	U		0.09	0.02	0.004	B	J	0.007	0.002	1.35			0.112	0.013	2.15			0.94	0.19
MAK102L	1/13/2014	822		J	0.808	0.081	1.39			0.04	0.004	12.5		J	0.04	0.01	3.67			0.40	0.12	ND		U	3.26	1.09	ND		U	0.152	0.061	ND	U		0.10	0.02	0.007	B	J	0.008	0.002	3.86			0.121	0.014	2.56			1.01	0.20
MAK105L	1/13/2014	104		J	0.786	0.079	0.16			0.04	0.004	2.14		J	0.04	0.01	2.16			0.40	0.12	ND		U	3.13	1.04	ND		U	0.147	0.059	ND	U		0.10	0.02	0.003	B	J	0.008	0.002	1.86			0.118	0.014	ND		U	0.98	0.20
MAK106L	1/14/2014	65.5		J	0.748	0.075	0.14			0.04	0.004	1.62		J	0.04	0.01	2.43			0.41	0.12	ND		U,N	3.04	1.01	ND		U	0.140	0.056	ND	U		0.09	0.02	0.004	B	J	0.007	0.002	1.25			0.112	0.013	ND		U	0.93	0.19
MAK108,109,110,113L	1/14/2014; 1/14/2014; 1/14/2014; 1/14/2014	821		J	0.802	0.080	1.58			0.04	0.004	11.7		J	0.04	0.01	3.25			0.41	0.12	ND		U	3.19	1.06	ND		U	0.150	0.060	ND	U		0.10	0.02	0.008	B		0.008	0.002	3.44			0.120	0.014	3.17			1.00	0.20
MAK111L	1/14/2014	666		J	0.815	0.081	1.29			0.04	0.004	11.1		J	0.04	0.01	2.46			0.43	0.13	ND		U	3.00	1.00	ND		U	0.153	0.061	ND	U		0.10	0.02	0.004	B	J	0.008	0.002	2.72			0.122	0.014	2.43			1.02	0.20
MAK112L	1/14/2014	957		J	0.805	0.080	1.25			0.04	0.004	ND	U	UJ	0.04	0.01	2.50			0.43	0.13	ND		U	3.28	1.09	0.063	B	J	0.151	0.060	ND	U		0.10	0.02	ND	U		0.008	0.002	3.85			0.121	0.014	ND	U		1.01	0.20
MAK115L	1/14/2014	44.1	M	J	0.774	0.077	0.14			0.04	0.004	1.10		J	0.04	0.01	1.88			0.42	0.13	ND		U	3.12	1.04	ND		U	0.145	0.058	ND	U		0.10	0.02	0.004	B	J	0.008	0.002	1.11			0.116	0.014	2.26			0.97	0.19

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Table F-6b: Concentrations of Metals in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Iron					Lead					Manganese					Mercury					Methyl Mercury					Selenium					Silver					Thallium					Vanadium					Zinc				
CAS Number		7439-89-6					7439-92-1					7439-96-5					7439-97-6					22967-92-6					7782-49-2					7440-22-4					7440-28-0					7440-62-2					7440-66-6				
Project Screening Values[1]		2,800					not defined					560					1,200					400					20					20					0.04					20					1,200				
Units		mg/kg-wet					mg/kg-wet					mg/kg-wet					ng/g-wet					ng/g-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet					mg/kg-wet				
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL	Result[2]	LQ	VQ	RL	MDL
Mokulēʻia																																																				
Octopus (Heʻe)																																																				
Dry Season																																																				
MAK009O	9/13/2013	ND		U	0.681	0.068	0.03	B		0.03	0.003	0.24			0.03	0.01	7.28			1.71	0.51	6.53			2.65	0.88	0.253			0.128	0.051	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.102	0.012	13.4			0.85	0.17
MAK010O	9/16/2013	ND		U	0.716	0.072	0.01	B	J	0.04	0.004	0.23			0.04	0.01	9.06			1.88	0.56	7.83			2.73	0.91	0.226			0.134	0.054	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.107	0.013	13.5			0.89	0.18
MAK011O	9/16/2013	ND		U	0.704	0.070	0.009	B	J	0.04	0.004	0.34			0.04	0.01	5.58			1.74	0.52	4.25			2.90	0.97	0.308			0.132	0.053	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.106	0.012	13.9			0.88	0.18
MAK015O	9/22/2013	ND		U	0.789	0.079	0.02	B	J	0.04	0.004	0.27			0.04	0.01	9.95			1.90	0.57	8.32			2.96	0.99	0.353			0.148	0.059	ND	U,J	UJ	0.10	0.02	ND	U		0.008	0.002	ND	U		0.118	0.014	13.4			0.99	0.20
MAK016O	9/22/2013	ND		U	0.738	0.074	0.16			0.04	0.004	0.29			0.04	0.01	8.18			1.90	0.57	6.76			2.95	0.98	0.283			0.138	0.055	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.111	0.013	14.5			0.92	0.18
MAK017O	9/22/2013	ND		U	0.743	0.074	0.11			0.04	0.004	0.26			0.04	0.01	16.4			1.88	0.56	11.6			2.59	0.86	0.308			0.139	0.056	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.112	0.013	16.1			0.93	0.19
MAK018O	9/22/2013	ND		U	0.698	0.070	0.03	B		0.03	0.003	0.27			0.03	0.01	11.7			1.92	0.57	9.30			2.81	0.94	0.285			0.131	0.052	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.105	0.012	14.8			0.87	0.17
MAK024O	9/27/2013	ND		U	0.699	0.070	0.004	B	J	0.03	0.003	0.25			0.03	0.01	14.2			1.94	0.58	15.3			2.84	0.95	0.235			0.131	0.052	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	ND	U		0.105	0.012	13.4			0.87	0.17
Wet Season																																																				
MAK109O	1/31/2014	1.20			0.75	0.07	0.345	M	J	0.039	0.004	0.230			0.037	0.011	8.96	N	J	0.37	0.11	7.2			2.9	1.0	ND		U	0.14	0.06	ND	U		0.091	0.018	ND	U		0.008	0.002	ND	U		0.112	0.013	30.0	M	J	0.91	0.36
MAK118O	3/27/2014	14.0			0.75	0.07	0.046		J	0.034	0.003	0.359			0.037	0.011	14.6		J	0.40	0.12	12.6			3.3	1.1	ND		U	0.14	0.06	ND	U		0.100	0.020	ND	U		0.007	0.002	ND	U		0.112	0.013	13.1		J	1.00	0.40
MAK119O	3/27/2014	1.64			0.80	0.08	ND	B	UJ	0.039	0.004	0.291			0.040	0.012	15.8		J	0.38	0.12	12.6			3.0	1.0	ND	B	U	0.15	0.06	ND	U		0.096	0.019	ND	U		0.008	0.002	ND	U		0.119	0.014	13.3		J	0.96	0.38
MAK120O	3/27/2014	1.47			0.72	0.07	ND	B	UJ	0.034	0.003	0.250			0.036	0.011	12.8		J	0.43	0.13	10.7			2.8	0.9	ND		U	0.14	0.05	ND	U		0.097	0.019	ND	U		0.007	0.002	0.016	B	J	0.108	0.013	14.5		J	0.97	0.39
MAK121O	3/27/2014	1.57			0.78	0.08	0.126		J	0.034	0.003	0.353			0.039	0.012	12.2		J	0.40	0.12	8.5			3.2	1.1	ND		U	0.15	0.06	ND	U		0.097	0.019	ND	U		0.007	0.002	ND	U		0.117	0.014	13.1		J	0.97	0.39
MAK122O	3/27/2014	1.46			0.85	0.08	ND	B	UJ	0.033	0.003	0.308			0.038	0.011	10.3		J	0.38	0.12	7.7			3.1	1.0	ND	B	U	0.16	0.06	ND	U		0.098	0.020	ND	U		0.007	0.002	ND	U		0.127	0.015	13.3		J	0.98	0.39
MAK123O	3/27/2014	1.70			0.75	0.07	ND	B	UJ	0.034	0.003	0.229			0.037	0.011	18.6		J	0.40	0.12	12.1			2.7	0.9	ND	B	U	0.14	0.06	ND	U		0.095	0.019	ND	U		0.007	0.002	ND	U		0.112	0.013	11.5		J	0.95	0.38
MAK124O	3/28/2014	221			0.75	0.07	0.051		J	0.037	0.004	0.389			0.037	0.011	13.0		J	0.40	0.12	10.9			3.0	1.0	ND		U	0.14	0.06	ND	U		0.093	0.019	ND	U		0.007	0.002	ND	U		0.112	0.013	13.2		J	0.93	0.37
Sea Cucumber (Loli)																																																				
Dry Season																																																				
MAK010C	9/13/2013	ND		U	0.742	0.074	0.02	B	J	0.04	0.004	0.19			0.04	0.01	0.22	J3	J	0.40	0.12	0.95	B	J	2.82	0.94	0.385			0.139	0.056	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	0.033	B	J	0.111	0.013	ND	B	U	0.93	0.19
MAK014C	9/13/2013	ND		U	0.710	0.071	0.47			0.04	0.004	0.34			0.04	0.01	1.48			0.39	0.12	ND	U		2.98	0.99	1.81			0.133	0.053	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	0.036	B	J	0.107	0.012	7.56			0.89	0.18
MAK020C	9/16/2013	6.34			0.783	0.078	2.14			0.04	0.004	0.29			0.04	0.01	2.49			0.37	0.11	ND	U		2.86	0.95	1.87			0.147	0.059	ND	U,J	UJ	0.10	0.02	ND	U		0.008	0.002	0.048	B	J	0.117	0.014	27.8			0.98	0.20
MAK022C	9/16/2013	ND		U	0.737	0.074	0.07			0.04	0.004	0.25			0.04	0.01	1.83			0.38	0.11	ND	U		2.91	0.97	2.37			0.138	0.055	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	0.044	B	J	0.110	0.013	2.92			0.92	0.18
MAK024C	9/22/2013	3.50			0.752	0.075	0.02	B	J	0.04	0.004	0.48			0.04	0.01	0.51			0.34	0.10	ND	U		2.67	0.89	0.333			0.141	0.056	ND	U,J	UJ	0.09	0.02	ND	U		0.008	0.002	0.026	B	J	0.113	0.013	3.21			0.94	0.19
MAK025C	9/22/2013	ND		U	0.800	0.080	0.04	B		0.04	0.004	0.49			0.04	0.01	2.88			0.38	0.11	ND	U		2.85	0.95	1.26			0.150	0.060	ND	U,J	UJ	0.10	0.02	ND	U		0.008	0.002	0.075	B	J	0.120	0.014	2.00			1.00	0.20
MAK026C	9/22/2013	ND		U	0.709	0.071	0.01	B	J	0.04	0.004	0.22			0.04	0.01	0.47			0.39	0.12	ND	U		2.91	0.97	0.303			0.133	0.053	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	0.030	B	J	0.106	0.012	1.02			0.89	0.18
MAK027C	9/22/2013	3.74			0.688	0.069	0.03	B		0.03	0.003	0.25			0.03	0.01	0.26	J3	J	0.38	0.11	ND	U		2.81	0.94	0.358			0.129	0.052	ND	U,J	UJ	0.09	0.02	ND	U		0.007	0.002	0.030	B	J	0.103	0.012	ND	B	U	0.86	0.17
Wet Season																																																				
MAK111C	1/31/2014	17.2	M		3.99	1.30	0.07			0.04	0.004	0.742			0.040	0.012	0.37	J3	J	0.41	0.12	ND	U		3.28	1.09	0.43			0.15	0.06	ND	U		0.100	0.020	ND	U		0.008	0.002	0.077	J3	J	0.120	0.014	1.56			1.00	0.20
MAK113C	1/31/2014	7.86			3.87	1.26	0.01	J3	J	0.04	0.004	0.303			0.039	0.012	0.46			0.39	0.12	ND	U		2.73	0.91	0.41			0.15	0.06	ND	U		0.097	0.019	ND	U		0.008	0.002	0.034	J3	J	0.116	0.014	ND	J3	U	0.97	0.19
MAK114C	1/31/2014	7.54			3.61	1.17	0.02	J3	J	0.04	0.004	0.320			0.036	0.011	0.47			0.41	0.12	ND	U		2.97	0.99	0.56			0.14	0.05	ND	U		0.090	0.018	ND	U		0.007	0.002	0.055	J3	J	0.108	0.013	1.70			0.90	0.18
MAK115C	1/31/2014	7.35			3.50	1.14	0.009	J3	J	0.04	0.004	0.384			0.035	0.011	0.67			0.41	0.12	ND	U		2.81	0.94	0.62			0.13	0.05	ND	U		0.088	0.018	ND	U		0.007	0.002	0.040	J3	J	0.105	0.012	1.19			0.88	0.18
MAK116C	1/31/2014	16.1			3.89	1.26	0.05			0.04	0.004	0.804			0.039	0.012	0.51			0.39	0.12	ND	U		3.12	1.04	0.62			0.15	0.06	ND	U		0.097	0.019	ND	U		0.008	0.002	0.081	J3	J	0.117	0.014	1.84			0.97	0.19
MAK117C	1/31/2014	19.5			3.78	1.23	0.11			0.04	0.004	0.691			0.038	0.011	3.12			0.39	0.12	ND	U		2.77	0.92	0.36			0.14	0.06	ND	U		0.095	0.019	ND	U		0.008	0.002	0.092	J3	J	0.113	0.013	ND	J3	U	0.95	0.19
MAK118C	1/31/2014	20.3			3.60	1.17	0.02	J3	J	0.04	0.004	0.743			0.036	0.011	0.42			0.39	0.12	ND	U		2.94	0.98	0.56			0.13	0.05	ND	U		0.090	0.018	ND	U		0.007	0.002	0.064	J3	J	0.108	0.013	1.78			0.90	0.18
MAK120C	2/11/2014	16.2			3.77	1.22	0.008	J3	J	0.04	0.004	0.410			0.038	0.011	0.54			0.39	0.12	ND	U		2.81	0.94	0.42			0.14	0.06	ND	U		0.094	0.019	ND	U		0.008	0.002	0.051	J3	J	0.113	0.013	ND	J3	U	0.94	0.19
Seaweed (Limu kohu)																																																				
Dry Season																																																				
MAK007L	9/16/2013	932	M	J	0.797	0.080	0.66	M	J	0.04	0.004	17.8	M	J	0.04	0.01	3.12			0.79	0.24	ND	U		2.96	0.99	0.093	B	J	0.149	0.060	ND	U,J	UJ	0.10	0.02	0.005	B	J	0.008	0.002	5.02	M	J	0.120	0.014	2.11			1.00	0.20
MAK009L	9/16/2013	312			0.752	0.075	0.46			0.04	0.004	6.53			0.04	0.01	2.83			0.80	0.24	ND	U		2.82	0.94	0.067	B	J	0.141	0.056	ND	U,J	UJ	0.09	0.02	0.004	B	J	0.008	0.002	2.82			0.113	0.013	1.64			0.94	0.19
MAK010L (comp)	9/16/2013	641			0.791	0.079	0.58			0.04	0.004	10.2			0.04	0.01	2.29			0.79	0.24	ND	U		2.91	0.97	0.068	B	J	0.148	0.059	ND	U,J	UJ	0.10	0.02	0.006	B	J	0.008	0.002	3.38			0.119	0.014	1.89			0.99	0.20
MAK044L	10/15/2013	422			0.778	0.078	0.31			0.04	0.004	8.15			0.04	0.01	2.19			0.79	0.24	ND	U		2.93	0.98	ND	U		0.146	0.058	ND	U,J	UJ	0.10	0.02	0.004	B	J	0.008	0.002	2.53			0.117	0.014	1.75			0.97	0.19
MAK045L	10/15/2013	184			0.794	0.079	0.34			0.04	0.004	3.50			0.04	0.01	2.16			0.79	0.24	ND	U		2.94	0.98	ND	U		0.149	0.060	ND	U,J	UJ	0.10	0.02	0.004	B	J	0.008	0.002	2.09			0.119	0.014	1.64			0.99	0.20
MAK046L	10/15/2013	469			0.756	0.076	0.67			0.04	0.004	8.61			0.04	0.01	2.42			0.80	0.24	ND	U		2.86	0.95	0.059	B	J	0.142	0.057	ND	U,J	UJ	0.09	0.02	0.004	B	J	0.008	0.002	2.58			0.113	0.013	1.85			0.95	0.19
MAK047L	10/15/2013	592			0.734	0.073	0.43			0.04	0.004	11.8			0.04	0.01	3.24			0.79	0.24	ND	U		2.70	0.90	0.067	B	J	0.138	0.055	ND	U,J	UJ	0.09	0.02	ND	B	U	0.007	0.002	2.70			0.110	0.013	2.14			0.92	0.18
MAK049L	10/15/2013	645			0.762	0.076	0.56			0.04	0.004	9.73			0.04	0.01	3.33			0.74	0.22	ND	U		2.82	0.94	0.068	B	J	0.143	0.057	ND	U,J	UJ	0.10	0.02	ND	B	U	0.008	0.002	2.64			0.114	0.013	2.64			0.95	0.19
Wet Season																																																				
MAK120L	1/31/2014	394		J	3.69	1.20	0.35			0.04	0.004	6.99		J	0.037	0.011	3.54			0.38	0.11	ND	U		2.92	0.97	0.08	J3	J	0.14	0.06	ND	U		0.092	0.018	0.004	J3	J	0.007	0.002	2.95			0.111	0.013	2.44			0.92	0.18
MAK121L	1/31/2014	221		J	3.84	1.25	0.25			0.04	0.004	3.57		J	0.038	0.012	4.38			0.39	0.12	ND	U		3.20	1.07	ND	U		0.14	0.06	ND	U		0.096	0.019	0.004	J3	J	0.008	0.002	1.80			0.115	0.013	1.74			0.96	0.19
MAK122L	1/31/2014	114	M	J	3.77	1.23	0.31			0.04	0.004	2.95	M	J	0.038	0.011	2.70			0.39	0.12	ND	U		2.92	0.97	ND	U		0.14	0.06	ND	U		0.094	0.019	0.004	J3	J	0.008	0.002	2.61	M		0.113	0.013	1.68			0.94	0.19
MAK123L	1/31/2014	70.1		J	3.91	1.27	0.16			0.04	0.004	1.93		J	0.039	0.012	2.02			0.41	0.12	ND	U		2.76	0.92	ND	U		0.15	0.06	ND	U		0.098	0.020	0.003	J3	J	0.008	0.002	2.06			0.117	0.014	1.24			0.98	0.20
MAK124L	1/31/2014	729		J	3.91	1.27	0.54			0.04	0.004	12.3		J	0.039	0.012	3.53			0.37	0.11	ND	U		2.54	0.85	0.11	J3	J	0.15	0.06	ND	U		0.098	0.020	0.005	J3	J	0.008	0.002	4.09			0.117	0.014	2.50			0.98	0.20
MAK126L	1/31/2014	1140		J	3.92	1.27	0.70			0.04	0.004	27.4		J	0.039	0.012	3.94			0.42	0.13	ND	U		2.76	0.92	0.09	J3	J	0.15	0.06	ND	U		0.098	0.020	0.008	J3		0.008	0.002	8.41			0.118	0.014	2.81			0.98	0.20
MAK127L	2/11/2014	112		J	3.88	1.26	0.20			0.04	0.004	2.44		J	0.039	0.012	2.15			0.40	0.12	ND	U		3.23	1.08	ND	U		0.15	0.06	ND	U		0.097	0.019	0.005	J3	J	0.008	0.002	1.77			0.117	0.014	1.12			0.97	0.19
MAK128L	2/11/2014	66.7		J	3.80	1.24	0.17			0.04	0.004	2.05		J	0.038	0.011	1.70			0.38	0.11	ND	U		3.19	1.06	ND	U		0.14	0.06	ND	U		0.095	0.019	0.004	J3	J	0.008	0.002	1.29			0.114	0.013	1.24			0.95	0.19

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Table F-6b: Concentrations of Metals in Biota Tissue, Mākua Marine Resources Supplemental Study

Analyte		Iron						Lead						Manganese						Mercury						Methyl Mercury						Selenium						Silver						Thallium						Vanadium						Zinc					
CAS Number		7439-89-6						7439-92-1						7439-96-5						7439-97-6						22967-92-6						7782-49-2						7440-22-4						7440-28-0						7440-62-2						7440-66-6					
Project Screening Values[1]		2,800						not defined						560						1,200						400						20						20						0.04						20						1,200					
Units		mg/kg-wet						mg/kg-wet						mg/kg-wet						ng/g-wet						ng/g-wet						mg/kg-wet						mg/kg-wet						mg/kg-wet						mg/kg-wet						mg/kg-wet					
Lab ID	Collection Date	Result[2]	LQ	VQ	RL	MDL		Result[2]	LQ	VQ	RL	MDL		Result[2]	LQ	VQ	RL	MDL		Result[2]	LQ	VQ	RL	MDL		Result[2]	LQ	VQ	RL	MDL		Result[2]	LQ	VQ	RL	MDL		Result[2]	LQ	VQ	RL	MDL		Result[2]	LQ	VQ	RL	MDL		Result[2]	LQ	VQ	RL	MDL		Result[2]	LQ	VQ	RL	MDL	
Ka'ena Point																																																													
Octopus (He'e)																																																													
Dry Season																																																													
MAK012O	9/22/2013	ND		U	0.765	0.076		0.01	B	J	0.04	0.004		0.28			0.04	0.01		9.02			1.92	0.58		4.36			2.67	0.89		0.269			0.143	0.057		ND	U,J	UJ	0.10	0.02		ND		U	0.008	0.002		ND		U	0.115	0.013		14.2			0.96	0.19
MAK013O	9/22/2013	ND		U	0.741	0.074		0.03	B	J	0.04	0.004		0.25			0.04	0.01		8.53			1.82	0.55		4.91			2.60	0.87		0.281			0.139	0.056		ND	U,J	UJ	0.09	0.02		ND		U	0.007	0.002		ND		U	0.111	0.013		15.2			0.93	0.19
MAK014O	9/23/2013	ND		U	0.676	0.068		0.01	B	J	0.03	0.003		0.23			0.03	0.01		13.4			1.89	0.57		6.68			2.88	0.96		0.274			0.127	0.051		ND	U,J	UJ	0.08	0.02		ND		U	0.007	0.002		ND		U	0.101	0.012		15.2			0.84	0.17
MAK019O	9/23/2013	ND		U	0.749	0.075		0.02	B	J	0.04	0.004		0.19			0.04	0.01		12.3			1.96	0.59		10.6			2.67	0.89		0.163			0.140	0.056		ND	U,J	UJ	0.09	0.02		ND		U	0.007	0.002		ND		U	0.112	0.013		11.3			0.94	0.19
MAK020O	9/23/2013	ND		U	0.760	0.076		0.07			0.04	0.004		0.24			0.04	0.01		8.08			1.81	0.54		8.58			2.89	0.96		0.235			0.143	0.057		ND	U,J	UJ	0.10	0.02		ND		U	0.008	0.002		ND		U	0.114	0.013		14.7			0.95	0.19
MAK021O	9/23/2013	ND		U	0.778	0.078		0.007	B	J	0.04	0.004		0.21			0.04	0.01		6.31			1.77	0.53		4.67			2.78	0.93		0.279			0.146	0.058		ND	U,J	UJ	0.10	0.02		ND		U	0.008	0.002		ND		U	0.117	0.014		12.9			0.97	0.19
MAK022O	9/23/2013	ND		U	0.795	0.080		0.01	B	J	0.04	0.004		0.27			0.04	0.01		9.53			1.97	0.59		8.45			2.74	0.91		0.313			0.149	0.060		ND	U,J	UJ	0.10	0.02		ND		U	0.008	0.002		ND		U	0.119	0.014		15.8			0.99	0.20
MAK023O	9/23/2013	ND		U	0.687	0.069		0.01	B	J	0.03	0.003		0.29			0.03	0.01		8.83			1.92	0.57		8.46			2.93	0.98		0.272			0.129	0.052		ND	U,J	UJ	0.09	0.02		ND		U	0.007	0.002		ND		U	0.103	0.012		13.4			0.86	0.17
Wet Season																																																													
MAK110O	3/28/2014	2.70			0.74	0.07		ND	B	UJ	0.035	0.003		0.274			0.037	0.011		8.11		J	0.44	0.13		6.4			2.9	1.0		ND		U	0.14	0.06		ND	U		0.098	0.020		ND		U	0.007	0.002		0.021	B	J	0.110	0.013		13.0		J	0.98	0.39
MAK111O	3/28/2014	1.64			0.75	0.07		0.778		J	0.041	0.004		0.288			0.037	0.011		12.3		J	0.42	0.13		10.1			3.2	1.1		ND		U	0.14	0.06		ND	U		0.092	0.018		ND		U	0.008	0.002		ND		U	0.112	0.013		20.5		J	0.92	0.37
MAK112O	3/28/2014	1.57			0.80	0.08		ND	B	UJ	0.039	0.004		0.247			0.040	0.012		10.8		J	0.40	0.12		8.6			3.0	1.0		ND		U	0.15	0.06		ND	U		0.094	0.019		ND		U	0.008	0.002		ND		U	0.120	0.014		12.5		J	0.94	0.38
MAK113O	3/28/2014	2.54			0.71	0.07		0.061		J	0.039	0.004		0.252			0.036	0.011		11.5		J	0.38	0.11		8.8			2.9	1.0		ND		U	0.13	0.05		ND	U		0.099	0.020		ND		U	0.008	0.002		ND		U	0.107	0.012		13.5		J	0.99	0.40
MAK114O	3/28/2014	3.60			0.73	0.07		ND	B	UJ	0.037	0.004		0.321			0.036	0.011		11.3		J	0.41	0.12		9.5			2.7	0.9		ND		U	0.14	0.05		ND	U		0.098	0.020		ND		U	0.007	0.002		ND		U	0.109	0.013		13.5		J	0.98	0.39
MAK115O	3/28/2014	1.32			0.71	0.07		0.140		J	0.034	0.003		0.225			0.036	0.011		11.0		J	0.43	0.13		9.0			3.0	1.0		ND		U	0.13	0.05		ND	U		0.093	0.019		ND		U	0.007	0.002		ND		U	0.107	0.012		13.2		J	0.93	0.37
MAK116O	3/28/2014	1.16			0.83	0.08		0.045		J	0.040	0.004		0.217			0.042	0.012		14.1		J	0.43	0.13		12.1			3.0	1.0		ND		U	0.16	0.06		ND	U		0.093	0.019		ND		U	0.008	0.002		ND		U	0.125	0.015		13.6		J	0.93	0.37
MAK117O	3/28/2014	2.08			0.78	0.08		0.062		J	0.039	0.004		0.228			0.039	0.012		9.30		J	0.43	0.13		6.8			2.9	1.0		ND	B	U	0.15	0.06		ND	U		0.091	0.018		ND		U	0.008	0.002		ND		U	0.117	0.014		12.3		J	0.91	0.36
Sea Cucumber (Loli)																																																													
Dry Season																																																													
MAK015C	9/13/2013	ND		U	0.774	0.077		0.17			0.04	0.004		0.68			0.04	0.01		2.70			0.38	0.12		ND	U		2.89	0.96		1.76			0.145	0.058		ND	U,J	UJ	0.10	0.02		ND		U	0.008	0.002		0.049	B	J	0.116	0.014		3.03			0.97	0.19
MAK018C	9/16/2013	ND		U	0.729	0.073		0.22			0.04	0.004		0.26			0.04	0.01		1.42			0.36	0.11		ND	U		2.71	0.90		2.29			0.137	0.055		ND	U,J	UJ	0.09	0.02		ND		U	0.007	0.002		0.038	B	J	0.109	0.013		2.09			0.91	0.18
MAK019C	9/16/2013	ND		U	0.730	0.073		0.42			0.04	0.004		0.26			0.04	0.01		1.65			0.34	0.10		ND	U		2.58	0.86		1.91			0.137	0.055		ND	U,J	UJ	0.09	0.02		ND		U	0.007	0.002		0.028	B	J	0.109	0.013		6.04			0.91	0.18
MAK028C	9/22/2013	ND		U	0.862	0.086		0.02	B	J	0.04	0.004		0.07			0.04	0.01		0.19	J3	J	0.36	0.11		ND	U		2.90	0.97		0.216			0.162	0.065		ND	U,J	UJ	0.11	0.02		ND		U	0.009	0.002		0.030	B	J	0.129	0.015		1.01	B	J	1.08	0.22
MAK029C	9/23/2013	3.34			0.722	0.072		0.10			0.04	0.004		0.23			0.04	0.01		0.40			0.38	0.11		ND	U		2.74	0.91		0.377			0.135	0.054		ND	U,J	UJ	0.09	0.02		ND		U	0.007	0.002		0.029	B	J	0.108	0.013		1.53			0.90	0.18
MAK030C	9/23/2013	ND		U	0.797	0.08		0.02	B	J	0.04	0.004		0.11			0.04	0.01		0.21	J3	J	0.39	0.12		ND	U		4.15	1.38		0.308			0.149	0.060		ND	U,J	UJ	0.10	0.02		ND		U	0.008	0.002		0.017	B	J	0.120	0.014		ND	B	U	1.00	0.20
MAK031C	9/23/2013	14.7			0.749	0.075		0.02	B	J	0.04	0.004		0.26			0.04	0.01		0.27	J3	J	0.39	0.12		ND	U		2.79	0.93		0.397			0.140	0.056		ND	U,J	UJ	0.09	0.02		ND		U	0.007	0.002		0.053	B	J	0.112	0.013		ND	B	U	0.94	0.19
MAK032C	9/23/2013	ND		U	0.700	0.070		0.03	B	J	0.04	0.004		0.15			0.04	0.01		0.24	J3	J	0.37	0.11		ND	U		4.34	1.45		0.322			0.132	0.053		ND	U,J	UJ	0.09	0.02		ND		U	0.007	0.002		0.021	B	J	0.105	0.012		ND		U	0.88	0.18
Wet Season																																																													
MAK121C	3/28/2014	9.34	M	J	0.76	0.08		ND	B	U	0.040	0.004		0.136			0.038	0.011		ND	B	UJ	0.38	0.11		ND	U		3.1	1.0		0.41			0.14	0.06		ND	U		0.096	0.019		ND		U	0.008	0.002		0.039	B	J	0.114	0.013		0.61	B	J	0.96	0.38
MAK122C	3/28/2014	4.63		J	0.78	0.08		ND	B	U	0.038	0.004		0.214			0.039	0.012		ND	B	UJ	0.41	0.12		ND	U		3.1	1.0		0.45			0.15	0.06		ND	U		0.095	0.019		ND		U	0.008	0.002		0.035	B	J	0.117	0.014		0.83	B	J	0.95	0.38
MAK123C	3/28/2014	7.10		J	0.78	0.08		2.25			0.038	0.004		0.201			0.039	0.012		ND	B	UJ	0.41	0.12		ND	U		3.0	1.0		0.42			0.15	0.06		ND	U		0.092	0.018		ND		U	0.008	0.002		0.044	B	J	0.117	0.014		21.6			0.92	0.37
MAK124C	3/28/2014	42.0		J	0.73	0.07		0.229			0.035	0.004		0.972			0.037	0.011		ND	B	UJ	0.41	0.12		ND	U		3.3	1.1		0.48			0.14	0.05		ND	U		0.095	0.019		ND		U	0.007	0.002		0.124			0.110	0.013		0.70	B	J	0.95	0.38
MAK125C	3/28/2014	34.8		J	0.72	0.07		0.078			0.035	0.004		0.727			0.036	0.011		ND		UJ	0.38	0.12		ND	U		2.7	0.9		0.54			0.14	0.05		ND	U		0.095	0.019		ND		U	0.007	0.002		0.118			0.108	0.013		1.24			0.95	0.38
MAK126C	3/28/2014	62.8		J	0.83	0.08		0.114			0.038	0.004		2.37			0.042	0.012		ND		UJ	0.42	0.13		ND	U		2.8	0.9		0.48			0.16	0.06		ND	U		0.094	0.019		ND		U	0.008	0.002		0.190			0.125	0.015		0.89	B	J	0.94	0.37
MAK127C	3/28/2014	46.3		J	0.91	0.09		0.172			0.041	0.004		0.981			0.040	0.012		ND		UJ	0.42	0.13		ND	U		3.2	1.1		0.68			0.17	0.07		ND	U		0.097	0.019		ND		U	0.008	0.002		0.166			0.137	0.016		0.98			0.97	0.39
MAK128C	3/28/2014	10.0		J	0.76	0.08		ND	B	U	0.037	0.004		0.281			0.038	0.011		ND	B	UJ	0.39	0.12		ND	U		3.0	1.0		0.34			0.14	0.06		ND	U		0.092	0.018		ND		U	0.007	0.002		0.040	B	J	0.113	0.013		0.62	B	J	0.92	0.37
Seaweed (Limu kohu)																																																													
Dry Season																																																													
MAK011L	9/16/2013	46.6			0.786	0.079		0.30			0.04	0.004		1.56			0.04	0.01		1.02			0.39	0.12		ND	U		2.82	0.94		ND	U		0.147	0.059		ND	U,J	UJ	0.10	0.02		0.005	B	J	0.008	0.002		1.12			0.118	0.014		1.75			0.98	0.20
MAK030L	10/11/2013	345			0.768	0.077		0.35			0.04	0.004		5.30			0.04	0.01		1.83			0.78	0.23		ND	U		2.97	0.99		ND	U		0.144	0.058		ND	U,J	UJ	0.10	0.02		0.009			0.008	0.002		2.46			0.115	0.013		2.65			0.96	0.19
MAK033L	10/11/2013	457			0.778	0.078		0.54			0.04	0.004		6.01			0.04	0.01		2.08			0.78	0.23		ND	U		2.92	0.97		ND	U		0.146	0.058		ND	U,J	UJ	0.10	0.02		0.007	B	J	0.008	0.002		4.01			0.117	0.014		1.26			0.97	0.19
MAK034L	10/11/2013	445			0.768	0.077		0.45			0.04	0.004		5.65			0.04	0.01		1.91			0.75	0.22		ND	U		2.72	0.91		ND	U		0.144	0.058		ND	U,J	UJ	0.10	0.02		0.007	B	J	0.008	0.002		2.96			0.115	0.013		1.46			0.96	0.19
MAK038L	10/11/2013	761			0.742	0.074		0.70			0.04	0.004		9.84			0.04	0.01		1.69			0.78	0.23		ND	U		2.73	0.91		ND	U		0.139	0.056		ND	U,J	UJ	0.09	0.02		0.008			0.007	0.002		3.87			0.111	0.013		1.83			0.93	0.19
MAK041L	10/11/2013	411			0.791	0.079		0.56			0.04	0.004		5.69			0.04	0.01		1.98			0.75	0.22		ND	U		2.96	0.99		ND	U		0.148	0.059		ND	U,J	UJ	0.10	0.02		0.005	B	J	0.008	0.002		2.40			0.119	0.014		1.94			0.99	0.20
MAK042L	10/11/2013	489			0.791	0.079		0.67			0.04	0.004		6.55			0.04	0.01		1.87			0.78	0.23		ND	U		2.94	0.98		ND	U		0.148	0.059		ND	U,J	UJ	0.10	0.02		0.008	B		0.008	0.002		2.64			0.119	0.014		2.02			0.99	0.20
MAK043L	10/11/2013	684			0.833	0.083		0.81			0.04	0.004		11.9			0.04	0.01		2.48			0.80	0.24		ND	U		2.96	0.99		0.064	B	J	0.156	0.062		ND	U,J	UJ	0.10	0.02		0.007	B	J	0.008	0.002		3.59			0.125	0.015		1.95			1.04	0.21
Wet Season																																																													
MAK116L	1/31/2014	135		J	3.55	1.15		0.24			0.04	0.004		2.42	J		0.035	0.011		2.25			0.39	0.12		ND	U		3.18	1.06		ND	U		0.13	0.05		ND	U		0.089	0.018		0.005	J3	J	0.007	0.002		1.26			0.106	0.012		1.54			0.89	0.18
MAK117L	1/31/2014	274		J	3.38	1.10		0.45			0.03	0.003		3.75	J		0.034	0.010		2.79			0.38	0.11		ND	U		2.68	0.89		ND	U		0.13	0.05		ND	U		0.084	0.017		0.003	J3	J	0.007	0.002		1.86			0.101	0.012		1.88			0.84	0.17
MAK118L	1/31/2014	29.1		J	3.86	1.25		0.10			0.04	0.004		0.973	J		0.039	0.012		2.29			0.39	0.12		ND	U		2.95	0.98		ND	U		0.14	0.06		ND	U		0.097	0.019		0.003	J3	J	0.008	0.002		0.906			0.116	0.014		ND	J3	U	0.97	0.19
MAK130L	3/27/2014	303			0.74	0.07		0.409			0.042	0.004		4.49			0.037	0.011		2.28			0.43	0.13		ND	U		3.2	1.1		0.11	B	J	0.14	0.06		ND	U		0.099	0.020		0.005	B	J	0.008	0.002		2.51			0.110	0.013		0.88	B	J	0.99	0.40
MAK132L	3/28/2014	276			0.81	0.08		0.406			0.035	0.003		3.76			0.041	0.012		3.07			0.42	0.13		ND	U		2.8	0.9		0.12	B	J	0.15	0.06		ND	U		0.099	0.020		0.006	B	J	0.007	0.002		2.44			0.122	0.014		0.83	B	J	0.99	0.40
MAK134L	3/28/2014	541			0.70	0.07		0.229			0.036	0.004		4.59			0.035	0.011		ND		U	0.38	0.12		ND	U		2.9	1.0		0.10	B	J	0.13	0.05		ND	U		0.098	0.020		0.005	B	J	0.007	0.002		2.90			0.105	0.012		0.60	B	J	0.98	0.39
MAK135L	3/28/2014	189			0.79	0.08		0.269			0.043	0.004		2.64			0.040	0.012		ND		U	0.37	0.11		ND	U		3.3	1.1		0.11	B	J	0.15	0.06		ND	U		0.097	0.019		0.005	B	J	0.009	0.002		1.66			0.119	0.014		0.65	B	J	0.97	0.39
MAK138L	3/28/2014	414			0.80	0.08		0.208	M		0.039	0.004		4.77			0.040	0.012		ND		U	0.36	0.11		ND	U		3.2	1.1		0.11	B	J	0.15	0.06		ND	U		0.093	0.019		0.006	B	J	0.008	0.002		2.70			0.120	0.014		0.95			0.93	0.37

Notes:

[1] Final screening values from fish advisories as listed in Table 9 of the *Final Supplemental Marine Resources Study Sampling and Analysis Plan* (August 2013).

[2] In the the Brooks Rand Lab laboratory reports, ND values are presented as the MDL with a "U" qualifier. In this table these results are presented as "ND" with a "U" LQ.

[3] For this result, the LQ is presented as "B" in the Brooks Rand Lab laboratory report but is reported as "J" in the Staged Electronic Data Deliverable file and thus in this table.

CAS - Chemical Abstracts Service
ID - identification
MDL - method detection limit
mg/kg-wet - milligrams per kilogram-wet weight
ND - not detected
ng/g-wet - nanograms per gram-wet weight
RL - reporting limit

Laboratory qualifier (LQ)

B - Detected by the instrument, the result is greater than the MDL but less than or equal to the RL. Result is reported and considered an estimat
J - Estimated value. A full explanation is presented in the Brooks Rand Lab laboratory reports case narratives
M - Duplicate precision (relative percent difference) was not within acceptance criteria. Result is estimate
N - Spike recovery was not within acceptance criteria. Result is estimated.
U - Result is less than or equal to the MDL or client requested reporting limit (CRRL). Result is reported as the MDL or CRRL.

Validator qualifier (VQ)

J - Indicates an estimated value.
U - Indicates the compound or analyte was analyzed for but not detected at or above the stated lim
UJ - Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated valu

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Table F-7: Concentrations of Arsenic Speciation in Biota Tissue, Mākua Marine Resources Supplemental Study

	Analyte	Inorganic Arsenic					Arsenic(III)					Arsenic(V)					Dimethyl Arsenic					Monomethyl Arsenic				
	CAS Number	*7440-38-2 (Inorg)*					*22569-72-8*					*12523-21-6*					*75-60-5*					*7440-38-2 (MMA)*				
	Project Screening Values[1]	*0.0267*					*0.0267*					*0.0267*					*not defined*					*not defined*				
	Units	*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**
Mākua																										
Octopus (He'e)																										
Dry Season																										
MAK001O	9/9/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.023			0.011	0.004	ND	U		0.011	0.004
MAK002O	9/9/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.016			0.011	0.004	ND	U		0.011	0.004
MAK003O	9/9/2013	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.017			0.012	0.004	ND	U		0.012	0.004
MAK004O	9/11/2013	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.014			0.011	0.004	ND	U		0.011	0.004
MAK005O	9/11/2013	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.011	B		0.011	0.004	ND	U		0.011	0.004
MAK006O	9/11/2013	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.013			0.012	0.004	ND	U,N	UJ	0.012	0.004
MAK007O	9/11/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.014			0.011	0.004	ND	U		0.011	0.004
MAK008O	9/11/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.023			0.011	0.004	ND	U,N	UJ	0.011	0.004
Wet Season																										
MAK101O	1/13/2014	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.024			0.011	0.004	ND	U,N	UJ	0.011	0.004
MAK102O	1/13/2014	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.029			0.012	0.004	ND	U	UJ	0.012	0.004
MAK103O	1/13/2014	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.018			0.011	0.004	ND	U	UJ	0.011	0.004
MAK104O	1/13/2014	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.010	B	J	0.012	0.004	ND	U	UJ	0.012	0.004
MAK105O	1/13/2014	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.008	B	J	0.011	0.004	ND	U	UJ	0.011	0.004
MAK106O	1/13/2014	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.006	B	J	0.011	0.004	ND	U	UJ	0.011	0.004
MAK107O	1/13/2014	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.007	B	J	0.011	0.004	ND	U	UJ	0.011	0.004
MAK108O	1/13/2014	ND	U		0.009	0.003	ND	U		0.009	0.003	ND	U		0.009	0.003	0.014			0.010	0.003	ND	U	UJ	0.010	0.003
Sea Cucumber (Loli)																										
Dry Season																										
MAK001C	9/9/2013	0.007	B	J	0.010	0.004	ND	U		0.010	0.004	0.007	B	J	0.010	0.004	ND	U		0.012	0.004	ND	U		0.012	0.004
MAK002C	9/9/2013	0.012			0.010	0.004	ND	U		0.010	0.004	0.012			0.010	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK004C	9/9/2013	0.010			0.009	0.004	ND	U		0.009	0.004	0.010			0.009	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK005C	9/9/2013	0.009	B		0.009	0.004	ND	U		0.009	0.004	0.009			0.009	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK006C	9/11/2013	0.020			0.009	0.004	0.006	B	J	0.009	0.004	0.014			0.009	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK007C	9/11/2013	0.017			0.010	0.004	ND	U		0.010	0.004	0.017			0.010	0.004	0.008	B	J	0.012	0.004	ND	U		0.012	0.004
MAK008C	9/11/2013	0.012			0.010	0.004	0.005	B	J	0.010	0.004	0.008	B	J	0.010	0.004	ND	U		0.012	0.004	ND	U		0.012	0.004
MAK009C	9/11/2013	**0.034**			0.009	0.004	0.010			0.009	0.004	0.024			0.009	0.004	0.005	B	J	0.011	0.004	ND	U		0.011	0.004
Wet Season																										
MAK102C	1/13/2014	0.010	B	J	0.010	0.004	ND	U		0.010	0.004	0.006	B	J	0.010	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK103C	1/13/2014	**0.055**		J	0.010	0.004	0.017			0.010	0.004	**0.039**		J	0.010	0.004	0.005	B	J	0.011	0.004	ND	U		0.011	0.004
MAK104C	1/13/2014	0.013		J	0.009	0.004	0.006	B	J	0.009	0.004	0.007	B	J	0.009	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK105C	1/13/2014	0.006	B	J	0.009	0.004	ND	U		0.009	0.004	0.006	B	J	0.009	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK106C	1/13/2014	**0.071**		J	0.009	0.004	0.019			0.009	0.004	**0.052**		J	0.009	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK107C	1/13/2014	0.025		J	0.010	0.004	0.011			0.010	0.004	0.015		J	0.010	0.004	ND	U		0.012	0.004	ND	U		0.012	0.004
MAK108C	1/13/2014	**0.037**		J	0.010	0.004	0.010	B		0.010	0.004	**0.027**		J	0.010	0.004	ND	U		0.012	0.004	ND	U		0.012	0.004
MAK110C	1/14/2014	0.025		J	0.010	0.004	0.007	B	J	0.010	0.004	0.018		J	0.010	0.004	0.006	B	J	0.012	0.004	ND	U		0.012	0.004
Seaweed (Limu kohu)																										
Dry Season																										
MAK001L/2L/26L	9/9/2013; 9/10/2013; 9/27/2013	**0.198**		J	0.039	0.016	**0.152**			0.039	0.016	**0.046**		J	0.039	0.016	0.352		J	0.024	0.008	ND	U		0.012	0.004
MAK013L	9/18/2013	**0.244**			0.199	0.079	**0.205**			0.040	0.016	**ND***	U		0.199	0.079	0.346		J	0.024	0.008	ND	U		0.024	0.008
MAK016L/21L/27L	9/23/2013; 9/27/2013; 9/27/2013	**0.605**			0.197	0.079	**0.479**			0.039	0.016	**0.126**	B	J	0.197	0.079	0.213		J	0.024	0.008	ND	U		0.024	0.008
MAK022L	9/27/2013	**0.224**			0.199	0.080	**0.207**			0.040	0.016	**ND***	U		0.199	0.080	0.294		J	0.024	0.008	ND	U		0.024	0.008
MAK023L	9/27/2013	**0.183**	B	J	0.198	0.079	**0.169**			0.040	0.016	**ND***	U		0.198	0.079	0.334		J	0.024	0.008	ND	U		0.024	0.008
MAK024L/25L	9/27/2013; 9/27/2013	**0.190**	B	J	0.198	0.079	**0.166**			0.040	0.016	**ND***	U		0.198	0.079	0.292		J	0.024	0.008	ND	U		0.024	0.008
MAK025L	9/27/2013	**0.177**			0.040	0.016	**0.142**			0.040	0.016	**0.035**	B	J	0.040	0.016	0.288		J	0.024	0.008	ND	U		0.024	0.008
MAK029L	10/11/2013	**0.602**			0.198	0.079	**0.511**			0.198	0.079	**0.092**	B	J	0.198	0.079	0.209		J	0.024	0.008	ND	U		0.024	0.008
Wet Season																										
MAK101L	1/13/2014	**0.286**			0.095	0.038	**0.262**			0.095	0.038	**ND***	U		0.095	0.038	0.208			0.011	0.004	ND	U		0.011	0.004
MAK102L	1/13/2014	**0.822**			0.096	0.038	**0.652**			0.096	0.038	**0.170**			0.096	0.038	0.293			0.011	0.004	ND	U		0.011	0.004
MAK105L	1/13/2014	**0.805**			0.095	0.038	**0.651**			0.095	0.038	**0.154**			0.095	0.038	0.248			0.011	0.004	ND	U		0.011	0.004
MAK106L	1/14/2014	**0.258**			0.175	0.070	**0.232**			0.088	0.035	**ND***	U		0.175	0.070	0.249			0.042	0.014	0.032	B	J	0.042	0.014
MAK108,109,110,113L	1/14/2014; 1/14/2014; 1/14/2014; 1/14/2014	**0.734**			0.084	0.034	**0.627**			0.084	0.034	**0.106**			0.084	0.034	0.240			0.010	0.003	ND	U		0.010	0.003
MAK111L	1/14/2014	**1.43**			0.099	0.040	**0.848**			0.099	0.040	**0.581**			0.099	0.040	0.197			0.012	0.004	ND	U		0.012	0.004
MAK112L	1/14/2014	**0.933**			0.087	0.035	**0.704**			0.087	0.035	**0.229**			0.087	0.035	0.175			0.010	0.003	ND	U		0.010	0.003
MAK115L	1/14/2014	**0.175**			0.095	0.038	**0.159**			0.095	0.038	**ND***	U		0.095	0.038	0.206			0.011	0.004	ND	U		0.011	0.004

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Table F-7: Concentrations of Arsenic Speciation in Biota Tissue, Mākua Marine Resources Supplemental Study

	Analyte	Inorganic Arsenic					Arsenic(III)					Arsenic(V)					Dimethyl Arsenic					Monomethyl Arsenic				
	CAS Number	*7440-38-2 (Inorg)*					*22569-72-8*					*12523-21-6*					*75-60-5*					*7440-38-2 (MMA)*				
	Project Screening Values[1]	*0.0267*					*0.0267*					*0.0267*					*not defined*					*not defined*				
	Units	*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**
Mokulēʻia																										
Octopus (Heʻe)																										
Dry Season																										
MAK009O	9/13/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.024			0.011	0.004	ND	U		0.011	0.004
MAK010O	9/16/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.016			0.011	0.004	ND	U		0.011	0.004
MAK011O	9/16/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.016			0.011	0.004	ND	U		0.011	0.004
MAK015O	9/22/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.023			0.011	0.004	ND	U		0.011	0.004
MAK016O	9/22/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.031			0.011	0.004	ND	U		0.011	0.004
MAK017O	9/22/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.019			0.011	0.004	ND	U		0.011	0.004
MAK018O	9/22/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.012			0.011	0.004	ND	U		0.011	0.004
MAK024O	9/27/2013	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.010	B	J	0.011	0.004	ND	U		0.011	0.004
Wet Season																										
MAK109O	1/31/2014	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.019			0.012	0.005	ND	U		0.012	0.004
MAK118O	3/27/2014	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.013			0.012	0.005	ND	U		0.012	0.004
MAK119O	3/27/2014	ND	U		0.009	0.003	ND	U		0.009	0.003	ND	U		0.009	0.003	0.010	B		0.010	0.004	ND	U		0.010	0.003
MAK120O	3/27/2014	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.017			0.012	0.005	ND	U		0.012	0.004
MAK121O	3/27/2014	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.018			0.011	0.005	ND	U		0.011	0.004
MAK122O	3/27/2014	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.014			0.011	0.005	ND	U		0.011	0.004
MAK123O	3/27/2014	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.010	B	J	0.012	0.005	ND	U		0.012	0.004
MAK124O	3/28/2014	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.008	B	J	0.011	0.005	ND	U		0.011	0.004
Sea Cucumber (Loli)																										
Dry Season																										
MAK010C	9/13/2013	0.015			0.010	0.004	ND	U		0.010	0.004	0.011			0.010	0.004	ND	U		0.012	0.004	ND	U		0.012	0.004
MAK014C	9/13/2013	0.014			0.010	0.004	0.007	B	J	0.010	0.004	0.008	B	J	0.010	0.004	0.009	B	J	0.011	0.004	ND	U		0.011	0.004
MAK020C	9/16/2013	0.024			0.010	0.004	0.012			0.010	0.004	0.012			0.010	0.004	0.007	B	J	0.012	0.004	ND	U		0.012	0.004
MAK022C	9/16/2013	0.022			0.009	0.004	0.019			0.009	0.004	ND	U		0.009	0.004	0.016			0.011	0.004	ND	U		0.011	0.004
MAK024C	9/22/2013	0.010			0.009	0.003	0.004	B	J	0.009	0.003	0.006	B	J	0.009	0.003	0.006	B	J	0.010	0.003	ND	U		0.010	0.003
MAK025C	9/22/2013	0.023			0.009	0.004	0.014			0.009	0.004	0.009			0.009	0.004	0.007	B	J	0.011	0.004	ND	U		0.011	0.004
MAK026C	9/22/2013	0.008	B	J	0.009	0.004	ND	U		0.009	0.004	0.008	B	J	0.009	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK027C	9/22/2013	0.012			0.009	0.004	ND	U		0.009	0.004	0.012			0.009	0.004	0.005	B	J	0.011	0.004	ND	U		0.011	0.004
Wet Season																										
MAK111C	1/31/2014	**0.049**			0.010	0.004	0.011			0.010	0.004	**0.038**			0.010	0.004	ND	U		0.012	0.005	ND	U		0.012	0.004
MAK113C	1/31/2014	0.018			0.010	0.004	0.006	J3	J	0.010	0.004	0.012			0.010	0.004	ND	U		0.012	0.005	ND	U		0.012	0.004
MAK114C	1/31/2014	0.015			0.009	0.004	0.006	J3	J	0.009	0.004	0.009			0.009	0.004	ND	U		0.011	0.005	ND	U		0.011	0.004
MAK115C	1/31/2014	**0.029**			0.010	0.004	0.009	J3	J	0.010	0.004	0.020			0.010	0.004	ND	U		0.012	0.005	ND	U		0.012	0.004
MAK116C	1/31/2014	**0.072**			0.009	0.004	0.021			0.009	0.004	**0.051**			0.009	0.004	ND	U		0.011	0.005	ND	U		0.011	0.004
MAK117C	1/31/2014	**0.029**			0.011	0.004	0.008	J3	J	0.011	0.004	0.021			0.011	0.004	ND	U		0.013	0.005	ND	U		0.013	0.004
MAK118C	1/31/2014	**0.032**			0.010	0.004	0.014			0.010	0.004	0.018			0.010	0.004	ND	U		0.012	0.005	ND	U		0.012	0.004
MAK120C	2/11/2014	0.017			0.009	0.003	0.007	J3	J	0.009	0.003	0.010			0.009	0.003	ND	U		0.010	0.004	ND	U		0.010	0.003
Seaweed (Limu kohu)																										
Dry Season																										
MAK007L	9/16/2013	**1.46**			0.196	0.078	**1.28**			0.196	0.078	**0.182**	B	J	0.196	0.078	0.300		J	0.023	0.008	ND	U		0.023	0.008
MAK009L	9/16/2013	**1.11**			0.198	0.079	**0.941**			0.198	0.079	**0.174**	B	J	0.198	0.079	0.267		J	0.024	0.008	ND	U		0.024	0.008
MAK010L (comp)	9/16/2013	**1.54**			0.197	0.079	**1.32**			0.197	0.079	**0.217**			0.197	0.079	0.276		J	0.024	0.008	ND	U		0.024	0.008
MAK044L	10/15/2013	**1.66**			0.198	0.079	**1.12**			0.198	0.079	**0.535**			0.198	0.079	0.103		J	0.024	0.008	ND	U		0.024	0.008
MAK045L	10/15/2013	**0.727**			0.195	0.078	**0.666**			0.195	0.078	**ND***	U		0.195	0.078	0.287		J	0.023	0.008	ND	U		0.023	0.008
MAK046L	10/15/2013	**0.744**			0.195	0.078	**0.644**			0.195	0.078	**0.100**	B	J	0.195	0.078	0.193		J	0.023	0.008	ND	U		0.023	0.008
MAK047L	10/15/2013	**0.945**			0.197	0.079	**0.748**			0.197	0.079	**0.196**	B	J	0.197	0.079	0.258		J	0.024	0.008	ND	U		0.024	0.008
MAK049L	10/15/2013	**0.619**			0.195	0.078	**0.530**			0.195	0.078	**0.089**	B	J	0.195	0.078	0.218		J	0.023	0.008	ND	U		0.023	0.008
Wet Season																										
MAK120L	1/31/2014	**1.42**		J	0.093	0.037	**1.39**			0.186	0.075	**ND***	U	UJ	0.186	0.075	0.270			0.112	0.047	ND	U		0.112	0.037
MAK121L	1/31/2014	**0.639**		J	0.095	0.038	**0.621**			0.095	0.038	**ND***	U	UJ	0.095	0.038	0.213			0.045	0.019	ND	U		0.045	0.015
MAK122L	1/31/2014	**0.430**		J	0.097	0.039	**0.428**			0.097	0.039	**ND***	U	UJ	0.097	0.039	0.231			0.046	0.019	ND	U		0.046	0.015
MAK123L	1/31/2014	**0.273**		J	0.095	0.038	**0.261**			0.095	0.038	**ND***	U	UJ	0.095	0.038	0.225			0.045	0.019	ND	U		0.045	0.015
MAK124L	1/31/2014	**1.28**		J	0.097	0.039	**1.05**			0.097	0.039	**0.236**		J	0.097	0.039	0.185			0.047	0.019	ND	U		0.047	0.016
MAK126L	1/31/2014	**1.38**		J	0.098	0.039	**1.05**			0.098	0.039	**0.332**		J	0.098	0.039	0.235			0.047	0.020	ND	U		0.047	0.016
MAK127L	2/11/2014	**0.271**		J	0.092	0.037	**0.272**			0.092	0.037	**ND***	U	UJ	0.092	0.037	0.194			0.044	0.018	ND	U		0.044	0.015
MAK128L	2/11/2014	**0.224**		J	0.097	0.039	**0.217**			0.097	0.039	**ND***	U	UJ	0.097	0.039	0.245			0.046	0.019	ND	U		0.046	0.015

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Table F-7: Concentrations of Arsenic Speciation in Biota Tissue, Mākua Marine Resources Supplemental Study

		Inorganic Arsenic					Arsenic(III)					Arsenic(V)					Dimethyl Arsenic					Monomethyl Arsenic				
Analyte		Inorganic Arsenic					Arsenic(III)					Arsenic(V)					Dimethyl Arsenic					Monomethyl Arsenic				
CAS Number		*7440-38-2 (Inorg)*					*22569-72-8*					*12523-21-6*					*75-60-5*					*7440-38-2 (MMA)*				
Project Screening Values[1]		*0.0267*					*0.0267*					*0.0267*					*not defined*					*not defined*				
Units		*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*					*mg/kg-wet*				
Lab ID	**Collection Date**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**	**Result[2]**	**LQ**	**VQ**	**RL**	**MDL**
Ka'ena Point																										
Octopus (He'e)																										
Dry Season																										
MAK012O	9/22/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.007	B	J	0.011	0.004	ND	U		0.011	0.004
MAK013O	9/22/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.008	B	J	0.011	0.004	ND	U		0.011	0.004
MAK014O	9/23/2013	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.018			0.012	0.004	ND	U		0.012	0.004
MAK019O	9/23/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.013			0.011	0.004	0.007	B	J	0.011	0.004
MAK020O	9/23/2013	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.018			0.011	0.004	ND	U		0.011	0.004
MAK021O	9/23/2013	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.021			0.012	0.004	ND	U		0.012	0.004
MAK022O	9/23/2013	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.026			0.011	0.004	ND	U		0.011	0.004
MAK023O	9/23/2013	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.018			0.012	0.004	ND	U		0.012	0.004
Wet Season																										
MAK110O	3/28/2014	ND	U		0.010	0.004	ND	U		0.010	0.004	0.004	B	J	0.010	0.004	0.017			0.012	0.005	ND	U		0.012	0.004
MAK111O	3/28/2014	ND	U		0.008	0.003	ND	U		0.008	0.003	ND	U		0.008	0.003	0.006	B	J	0.010	0.004	ND	U		0.010	0.003
MAK112O	3/28/2014	ND	U		0.009	0.003	ND	U		0.009	0.003	ND	U		0.009	0.003	0.015			0.010	0.004	ND	U		0.010	0.003
MAK113O	3/28/2014	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	0.016			0.012	0.005	ND	U		0.012	0.004
MAK114O	3/28/2014	ND	U		0.009	0.003	ND	U		0.009	0.003	ND	U		0.009	0.003	0.016			0.010	0.004	ND	U		0.010	0.003
MAK115O	3/28/2014	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.016			0.011	0.005	ND	U		0.011	0.004
MAK116O	3/28/2014	ND	U		0.009	0.003	ND	U		0.009	0.003	ND	U		0.009	0.003	0.015			0.010	0.004	ND	U		0.010	0.003
MAK117O	3/28/2014	ND	U		0.009	0.004	ND	U		0.009	0.004	ND	U		0.009	0.004	0.014			0.011	0.005	ND	U		0.011	0.004
Sea Cucumber (Loli)																										
Dry Season																										
MAK015C	9/13/2013	0.016			0.009	0.004	0.014			0.009	0.004	ND	U		0.009	0.004	0.006	B	J	0.011	0.004	ND	U		0.011	0.004
MAK018C	9/16/2013	0.017			0.009	0.004	0.016			0.009	0.004	ND	U		0.009	0.004	0.008	B	J	0.011	0.004	ND	U		0.011	0.004
MAK019C	9/16/2013	0.019			0.009	0.004	0.011			0.009	0.004	0.009			0.009	0.004	0.008	B	J	0.011	0.004	ND	U		0.011	0.004
MAK028C	9/22/2013	0.010	B		0.010	0.004	ND	U		0.010	0.004	0.010			0.010	0.004	ND	U		0.012	0.004	ND	U		0.012	0.004
MAK029C	9/23/2013	0.009	B	J	0.010	0.004	ND	U		0.010	0.004	0.009	B	J	0.010	0.004	ND	U		0.012	0.004	ND	U		0.012	0.004
MAK030C	9/23/2013	0.009	B		0.009	0.004	ND	U		0.009	0.004	0.005	B	J	0.009	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK031C	9/23/2013	0.016			0.009	0.004	ND	U		0.009	0.004	0.013			0.009	0.004	ND	U		0.011	0.004	ND	U		0.011	0.004
MAK032C	9/23/2013	0.008	B	J	0.010	0.004	ND	U		0.010	0.004	ND	U		0.010	0.004	ND	U		0.012	0.004	ND	U		0.012	0.004
Wet Season																										
MAK121C	3/28/2014	0.006	B	J	0.010	0.004	ND	U		0.010	0.004	0.006	B	J	0.010	0.004	ND	U		0.012	0.005	ND	U		0.012	0.004
MAK122C	3/28/2014	0.024			0.008	0.003	0.007	J,B	J	0.008	0.003	0.016			0.008	0.003	ND	U		0.010	0.004	ND	U		0.010	0.003
MAK123C	3/28/2014	0.018			0.010	0.004	0.006	J,B	J	0.010	0.004	0.012			0.010	0.004	0.006	B	J	0.011	0.005	ND	U		0.011	0.004
MAK124C	3/28/2014	**0.067**			0.009	0.004	0.009	J,B		0.009	0.004	**0.057**			0.009	0.004	ND	U		0.011	0.005	ND	U		0.011	0.004
MAK125C	3/28/2014	**0.059**			0.009	0.004	0.014	J		0.009	0.004	**0.045**			0.009	0.004	0.005	B	J	0.011	0.004	ND	U		0.011	0.004
MAK126C	3/28/2014	**0.056**			0.009	0.004	0.008	J,B	J	0.009	0.004	**0.048**			0.009	0.004	ND	U		0.011	0.005	ND	U		0.011	0.004
MAK127C	3/28/2014	**0.071**			0.010	0.004	0.019	J		0.010	0.004	**0.053**			0.010	0.004	0.006	B	J	0.012	0.005	ND	U		0.012	0.004
MAK128C	3/28/2014	**0.040**			0.010	0.004	0.008	J,B	J	0.010	0.004	**0.032**			0.010	0.004	ND	U		0.011	0.005	0.006	B	J	0.011	0.004
Seaweed (Limu kohu)																										
Dry Season																										
MAK011L	9/16/2013	**0.512**			0.197	0.079	**0.420**			0.197	0.079	**0.092**	B	J	0.197	0.079	0.287		J	0.024	0.008	ND	U		0.024	0.008
MAK030L	10/11/2013	**1.30**			0.195	0.078	**1.11**			0.195	0.078	**0.189**	B	J	0.195	0.078	0.141		J	0.023	0.008	ND	U		0.023	0.008
MAK033L	10/11/2013	**1.61**			0.199	0.080	**1.45**			0.199	0.080	**0.165**	B	J	0.199	0.080	0.142		J	0.024	0.008	ND	U		0.024	0.008
MAK034L	10/11/2013	**1.36**			0.195	0.078	**1.19**			0.195	0.078	**0.177**	B	J	0.195	0.078	0.138		J	0.023	0.008	ND	U		0.023	0.008
MAK038L	10/11/2013	**1.03**			0.197	0.079	**0.844**			0.197	0.079	**0.183**	B	J	0.197	0.079	0.124		J	0.024	0.008	ND	U		0.024	0.008
MAK041L	10/11/2013	**0.757**			0.199	0.080	**0.703**			0.199	0.080	**ND***	U		0.199	0.080	0.161		J	0.024	0.008	0.011	B	J	0.024	0.008
MAK042L	10/11/2013	**0.765**			0.199	0.080	**0.678**			0.199	0.080	**0.087**	B	J	0.199	0.080	0.190		J	0.024	0.008	ND	U		0.024	0.008
MAK043L	10/11/2013	**0.766**			0.200	0.080	**0.733**			0.200	0.080	**ND***	U		0.200	0.080	0.197		J	0.024	0.008	ND	U		0.024	0.008
Wet Season																										
MAK116L	1/31/2014	**0.350**		J	0.100	0.040	**0.287**			0.100	0.040	**0.063**	J3	J	0.100	0.040	0.202			0.048	0.020	ND	U		0.048	0.016
MAK117L	1/31/2014	**0.468**		J	0.089	0.036	**0.410**			0.089	0.036	**0.058**	J3	J	0.089	0.036	0.229			0.043	0.018	ND	U		0.043	0.014
MAK118L	1/31/2014	**0.184**		J	0.103	0.041	**0.163**			0.103	0.041	**ND***	U	UJ	0.103	0.041	0.186			0.049	0.021	ND	U		0.049	0.016
MAK130L	3/27/2014	**0.381**			0.040	0.016	**0.309**			0.040	0.016	**0.072**			0.040	0.016	0.116			0.048	0.020	ND	U		0.048	0.016
MAK132L	3/28/2014	**0.482**			0.035	0.014	**0.400**			0.035	0.014	**0.082**			0.035	0.014	0.131			0.042	0.017	ND	U		0.042	0.014
MAK134L	3/28/2014	**0.296**			0.039	0.016	**0.246**			0.039	0.016	**0.050**			0.039	0.016	0.149			0.047	0.019	ND	U		0.047	0.016
MAK135L	3/28/2014	**0.300**			0.039	0.015	**0.259**			0.039	0.015	**0.041**			0.039	0.015	0.134			0.046	0.019	ND	U		0.046	0.015
MAK138L	3/28/2014	**0.423**			0.037	0.015	**0.363**			0.037	0.015	**0.061**			0.037	0.015	0.142			0.045	0.019	ND	U		0.045	0.015

Notes:

Bold results exceed the project screening values.

ND* - MDL exceeds the project screening value.

[1] Final screening values from fish advisories as listed in Table 9 of the *Final Supplemental Marine Resources Study Sampling and Analysis Plan* (August 2013).

[2] In the the Brooks Rand Lab laboratory reports, ND values are presented as the MDL with a "U" qualifier. In this table these results are presented as "ND" with a "U" LQ.

[3] For this result, the LQ is presented as "B" in the Brooks Rand Lab laboratory report but is reported as "J" in the Staged Electronic Data Deliverable file and thus in this table.

CAS - Chemical Abstracts Service

mg/kg-wet - milligrams per kilogram-wet weight

ID - identification

ND - not detected

MDL - method detection limit

RL - reporting limit

Laboratory qualifier (LQ)

B - Detected by the instrument, the result is greater than the MDL but less than or equal to the RL. Result is reported and considered an estimate.

J - Estimated value. A full explanation is presented in the Brooks Rand Lab laboratory reports case narratives.

N - Spike recovery was not within acceptance criteria. Result is estimated.

U - Result is less than or equal to the MDL or client requested reporting limit (CRRL). Result is reported as the MDL or CRRL.

Validator qualifier (VQ)

J - Indicates an estimated value.

UJ - Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

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Appendix G: Statistical Results

Table G-1: Comparison of Organochlorine Pesticides Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV[1] *(µg/kg-wet)*	Minimum *(µg/kg-wet)*	Maximum *(µg/kg-wet)*	Mean[2] *(µg/kg-wet)*	SD *(µg/kg-wet)*	SEM *(µg/kg-wet)*	Mean:SV[3]	p-value[4]
alpha-BHC											
Limu Kohu											
Mākua	*Dry*	6	2	6.35	4.05	14.0	**10.8**	3.8	1.5	**1.7**	--
Mokulēʻia	*Dry*	4	4	6.35	9.80	22.7	**14.2**	5.8	2.9	**2.2**	0.703
Kaʻena Point	*Wet*	2	6	6.35	23.5	42.2	**32.9**	13.2	9.4	**5.2**	N/A
Heptachlor											
Limu Kohu											
Mākua	*Dry*	6	2	8.89	27.3	67.0	**48.9***	16.2	6.6	**5.5**	--
Heptachlor Epoxide											
Limu Kohu											
Mākua	*Dry*	1	7	4.40	83.9	83.9	**83.9***	N/A	N/A	**19.1**	--

Notes:

* Mean concentration of samples collected from Mākua exceeded the SV and is significantly greater than both the mean concentrations of samples collected from the background locations (Mokulēʻia and Kaʻena Point) or constituent was not detected in samples from the background locations.

[1] Final screening values (SVs) from fish advisories as listed in Table 9 of the Final Supplemental Marine Resources Study Sampling and Analysis Plan (August 2013).

[2] **Bold** mean values exceed the SV.

[3] **Bold** mean/SV ratios are greater than 1.

[4] P-values <0.05 are **bolded** and indicates that mean concentration of samples collected from Mākua is significantly greater than the mean concentration of samples collected from Mokulēʻia or Kaʻena Point. P-values were only calculated if detections of an analyte occurred at Mākua and the background locations during the same sampling season.

µg/kg-wet - micrograms per kilogram-wet weight

N/A - not applicable

SD - standard deviation

SEM - standard error of the mean

Table G-2: Comparison of Energetic Compounds Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV[1] *(µg/kg-wet)*	Minimum *(µg/kg-wet)*	Maximum *(µg/kg-wet)*	Mean *(µg/kg-wet)*	SD *(µg/kg-wet)*	SEM *(µg/kg-wet)*	Mean:SV	p-value[2]
Perchlorate											
He ʻe											
Mākua	*Dry*	1	7	2,800	0.62	0.62	0.62	N/A	N/A	0.00022	--
Mokulēʻia	*Wet*	1	7	2,800	0.45	0.45	0.45	N/A	N/A	0.00016	N/A
Loli											
Kaʻena Point	*Dry*	1	7	2,800	0.58	0.58	0.58	N/A	N/A	0.00021	N/A
	Wet	4	4	2,800	0.31	0.79	0.54	0.25	0.12	0.00019	N/A
Limu Kohu											
Mokulēʻia	*Dry*	7	1	2,800	0.32	3.9	1.5	1.3	0.5	0.00053	N/A
	Wet	7	1	2,800	0.41	12	4	5	2	0.00142	N/A
Kaʻena Point	*Dry*	5	3	2,800	0.30	0.55	0.44	0.10	0.05	0.00016	N/A
	Wet	5	3	2,800	0.32	0.74	0.46	0.19	0.08	0.00016	N/A

Notes:

[1] Final screening values (SVs) from fish advisories as listed in Table 9 of the Final Supplemental Marine Resources Study Sampling and Analysis Plan (August 2013).

[2] P-values were only calculated if detections of an analyte occurred at Mākua and the background locations during the same sampling season.

µg/kg-wet - micrograms per kilogram-wet weight

N/A - not applicable

SD - standard deviation

SEM - standard error of the mean

Table G-3: Comparison of Dioxins/Dibenzofurans Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV[1] *(ng/kg-wet)*	Minimum *(ng/kg-wet)*	Maximum *(ng/kg-wet)*	Mean[2] *(ng/kg-wet)*	SD (ng/kg-wet)	SEM (ng/kg-wet)	Mean:SV[3]	p-value[4]
2,3,7,8-TCDF											
He ʻe											
Mākua	*Wet*	6	2	3.08	0.065	0.075	0.071	0.004	0.002	0.02	--
Loli											
Mokulēʻia	*Dry*	6	2	3.08	0.061	0.12	0.08	0.02	0.01	0.03	N/A
Kaʻena Point	*Dry*	5	3	3.08	0.058	0.094	0.078	0.015	0.007	0.03	N/A
Limu Kohu											
Mākua	*Dry*	4	4	3.08	0.089	0.120	0.100	0.014	0.007	0.03	--
Mokulēʻia	*Dry*	3	5	3.08	0.074	0.13	0.11	0.03	0.02	0.04	0.762
Kaʻena Point	*Dry*	4	4	3.08	0.088	0.130	0.107	0.018	0.009	0.03	0.719
Total TCDF											
He ʻe											
Mākua	*Dry*	4	4	3.08	0.064	0.170	0.123	0.051	0.025	0.04	--
	Wet	8	0	3.08	0.043	0.150	0.089	0.034	0.012	0.03	--
Mokulēʻia	*Dry*	6	2	3.08	0.052	0.14	0.07	0.03	0.01	0.02	**0.0346**
	Wet	2	6	3.08	0.10	0.11	0.11	0.01	0.01	0.03	0.856
Kaʻena Point	*Dry*	6	2	3.08	0.042	0.180	0.077	0.051	0.021	0.03	0.12
	Wet	5	3	3.08	0.074	0.19	0.13	0.04	0.02	0.04	0.967
Loli											
Mākua	*Dry*	1	7	3.08	0.100	0.100	0.100	N/A	N/A	0.03	--
	Wet	6	2	3.08	0.062	0.140	0.101	0.035	0.014	0.03	--
Mokulēʻia	*Dry*	4	4	3.08	0.042	0.320	0.139	0.125	0.062	0.05	N/A
	Wet	8	0	3.08	0.059	0.690	0.467	0.217	0.077	0.15	0.992
Kaʻena Point	*Dry*	6	2	3.08	0.057	0.33	0.14	0.10	0.04	0.05	N/A
	Wet	6	2	3.08	0.11	0.17	0.14	0.02	0.01	0.04	0.969
Limu Kohu											
Mākua	*Dry*	5	3	3.08	0.100	0.500	0.240	0.153	0.068	0.08	--
	Wet	1	7	3.08	0.380	0.380	0.380	N/A	N/A	0.1	--
Mokulēʻia	*Dry*	3	5	3.08	0.120	0.28	0.18	0.09	0.05	0.06	0.383
	Wet	3	5	3.08	0.26	0.35	0.29	0.05	0.03	0.1	N/A
Kaʻena Point	*Dry*	3	5	3.08	0.11	1.4	0.6	0.7	0.4	0.2	0.56
	Wet	5	3	3.08	0.097	0.45	0.24	0.14	0.06	0.08	N/A
Total TCDD											
He ʻe											
Mākua	*Dry*	6	2	0.308	0.350	0.580	**0.463**	0.079	0.032	**1.5**	--
	Wet	1	7	0.308	0.092	0.092	0.092	N/A	N/A	0.3	--
Mokulēʻia	*Dry*	5	3	0.308	0.130	0.59	0.25	0.19	0.09	0.8	0.0603
	Wet	3	5	0.308	0.16	0.20	0.18	0.02	0.01	0.6	N/A
Kaʻena Point	*Dry*	6	2	0.308	0.120	0.460	**0.350**	0.124	0.051	**1.1**	0.0543
	Wet	5	3	0.308	0.200	0.48	0.28	0.11	0.05	0.9	N/A
Loli											
Mākua	*Dry*	6	2	0.308	0.25	0.91	**0.60**	0.27	0.11	**1.9**	--
Mokulēʻia	*Dry*	7	1	0.308	0.490	1.40	**0.92**	0.38	0.14	**3.0**	0.924
	Wet	4	4	0.308	0.087	0.130	0.109	0.019	0.010	0.4	N/A
Kaʻena Point	*Dry*	7	1	0.308	0.91	1.3	**1.1**	0.2	0.1	**3.5**	0.999
	Wet	4	4	0.308	0.12	0.18	0.15	0.03	0.01	0.5	N/A
Limu Kohu											
Mākua	*Dry*	7	1	0.308	0.400	1.00	**0.61**	0.21	0.08	**2.0**	--
Mokulēʻia	*Dry*	8	0	0.308	0.38	0.960	**0.69**	0.17	0.06	**2.2**	0.864
	Wet	6	2	0.308	0.11	0.210	0.15	0.04	0.01	0.5	N/A
Kaʻena Point	*Dry*	8	0	0.308	0.38	0.65	**0.51**	0.09	0.03	**1.6**	0.162
	Wet	4	4	0.308	0.11	0.16	0.14	0.02	0.01	0.4	N/A
2,3,4,7,8-PeCDF											
Loli											
Mākua	*Wet*	2	6	1.03	0.022	0.038	0.030	0.011	0.008	0.03	--
Total PeCDF											
He ʻe											
Mokulēʻia	*Dry*	1	7	1.03	0.061	0.061	0.061	N/A	N/A	0.06	N/A
Loli											
Mākua	*Wet*	1	7	1.03	0.038	0.038	0.038	N/A	N/A	0.04	--
Mokulēʻia	*Dry*	1	7	1.03	0.230	0.230	0.230	N/A	N/A	0.2	N/A
Kaʻena Point	*Dry*	1	7	1.03	0.057	0.057	0.057	N/A	N/A	0.06	N/A
Limu Kohu											
Mākua	*Wet*	3	5	1.03	0.067	0.160	0.109	0.047	0.027	0.1	--
Mokulēʻia	*Wet*	1	7	1.03	0.21	0.21	0.21	N/A	N/A	0.2	N/A
Kaʻena Point	*Dry*	3	5	1.03	0.081	0.370	0.184	0.162	0.093	0.2	N/A
	Wet	1	7	1.03	0.0190	0.0190	0.0190	N/A	N/A	0.02	N/A
1,2,3,7,8-PeCDD											
Limu Kohu											
Mākua	*Dry*	1	7	0.308	0.046	0.046	0.046	N/A	N/A	0.1	--

Table G-3: Comparison of Dioxins/Dibenzofurans Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV[1] *(ng/kg-wet)*	Minimum *(ng/kg-wet)*	Maximum *(ng/kg-wet)*	Mean[2] *(ng/kg-wet)*	SD (ng/kg-wet)	SEM (ng/kg-wet)	Mean:SV[3]	p-value[4]
Total PeCDD											
He ʻe											
Mākua	*Dry*	1	7	0.308	1.40	1.40	**1.40**	N/A	N/A	**4.5**	--
Kaʻena Point	*Dry*	1	7	0.308	0.046	0.046	0.046	N/A	N/A	0.1	N/A
Loli											
Mākua	*Dry*	1	7	0.308	0.12	0.12	0.12	N/A	N/A	0.4	--
Mokulēʻia	*Dry*	6	2	0.308	0.055	0.13	0.10	0.03	0.01	0.3	N/A
Kaʻena Point	*Dry*	4	4	0.308	0.035	0.180	0.105	0.061	0.031	0.3	N/A
Limu Kohu											
Mākua	*Dry*	4	4	0.308	0.061	0.220	0.128	0.072	0.036	0.4	--
Mokulēʻia	*Dry*	6	2	0.308	0.064	0.220	0.136	0.069	0.028	0.4	0.627
Kaʻena Point	*Dry*	5	3	0.308	0.045	0.140	0.094	0.034	0.015	0.3	0.357
1,2,3,4,7,8-HxCDF											
He ʻe											
Mākua	*Wet*	1	7	3.08	0.034	0.034	0.034	N/A	N/A	0.01	--
Loli											
Mākua	*Wet*	2	6	3.08	0.033	0.049	0.041	0.011	0.008	0.01	--
Kaʻena Point	*Dry*	1	7	3.08	0.037	0.037	0.037	N/A	N/A	0.01	N/A
Limu Kohu											
Mākua	*Wet*	1	7	3.08	0.023	0.023	0.023	N/A	N/A	0.01	--
Kaʻena Point	*Wet*	1	7	3.08	0.027	0.027	0.027	N/A	N/A	0.01	N/A
1,2,3,6,7,8-HxCDF											
Loli											
Kaʻena Point	*Dry*	1	7	3.08	0.041	0.041	0.041	N/A	N/A	0.01	N/A
Limu Kohu											
Mākua	*Dry*	2	6	3.08	0.050	0.057	0.054	0.005	0.004	0.02	--
	Wet	2	6	3.08	0.023	0.029	0.026	0.004	0.003	0.01	--
Mokulēʻia	*Dry*	1	7	3.08	0.058	0.058	0.058	N/A	N/A	0.02	N/A
1,2,3,7,8,9-HxCDF											
He ʻe											
Mokulēʻia	*Wet*	3	5	3.08	0.11	0.16	0.13	0.03	0.01	0.04	N/A
Loli											
Mākua	*Wet*	1	7	3.08	0.038	0.038	0.038	N/A	N/A	0.01	--
Kaʻena Point	*Dry*	1	7	3.08	0.054	0.054	0.054	N/A	N/A	0.02	N/A
Limu Kohu											
Mākua	*Wet*	1	7	3.08	0.024	0.024	0.024	N/A	N/A	0.01	--
2,3,4,6,7,8-HxCDF											
Loli											
Mākua	*Wet*	2	6	3.08	0.030	0.061	0.0455	0.022	0.016	0.01	--
Kaʻena Point	*Dry*	3	5	3.08	0.033	0.073	0.0477	0.022	0.013	0.02	N/A
Limu Kohu											
Mākua	*Wet*	1	7	3.08	0.019	0.019	0.019	N/A	N/A	0.01	--
Kaʻena Point	*Wet*	1	7	3.08	0.018	0.018	0.018	N/A	N/A	0.01	N/A
Total HxCDF											
He ʻe											
Mākua	*Wet*	1	7	3.08	0.037	0.037	0.037	N/A	N/A	0.01	--
Mokulēʻia	*Dry*	3	5	3.08	0.048	0.140	0.085	0.049	0.028	0.03	N/A
	Wet	1	7	3.08	0.16	0.16	0.16	N/A	N/A	0.05	N/A
Kaʻena Point	*Dry*	1	7	3.08	0.036	0.036	0.036	N/A	N/A	0.01	N/A
Loli											
Mākua	*Wet*	1	7	3.08	0.110	0.110	0.110	N/A	N/A	0.04	--
Mokulēʻia	*Dry*	1	7	3.08	0.074	0.074	0.074	N/A	N/A	0.02	N/A
Kaʻena Point	*Dry*	3	5	3.08	0.033	0.110	0.060	0.043	0.025	0.02	N/A
Limu Kohu											
Mākua	*Dry*	4	4	3.08	0.043	0.390	0.155	0.158	0.079	0.05	--
	Wet	3	5	3.08	0.023	0.029	0.025	0.003	0.002	0.01	--
Mokulēʻia	*Dry*	2	6	3.08	0.050	0.058	0.054	0.006	0.004	0.02	0.244
	Wet	3	5	3.08	0.10	0.11	0.10	0.01	0.00	0.03	0.987
Kaʻena Point	*Dry*	1	7	3.08	0.054	0.054	0.054	N/A	N/A	0.02	N/A
1,2,3,4,7,8-HxCDD											
He ʻe											
Mokulēʻia	*Dry*	1	7	3.08	0.072	0.072	0.072	N/A	N/A	0.02	N/A
Loli											
Mākua	*Wet*	1	7	3.08	0.037	0.037	0.037	N/A	N/A	0.01	--
Mokulēʻia	*Wet*	2	6	3.08	0.055	0.063	0.059	0.006	0.004	0.02	N/A
Kaʻena Point	*Dry*	1	7	3.08	0.036	0.036	0.036	N/A	N/A	0.01	N/A
Limu Kohu											
Mākua	*Wet*	2	6	3.08	0.056	0.090	0.073	0.024	0.017	0.02	--
1,2,3,6,7,8-HxCDD											
He ʻe											
Mākua	*Wet*	1	7	3.08	0.047	0.047	0.047	N/A	N/A	0.02	--
Mokulēʻia	*Wet*	2	6	3.08	0.069	0.14	0.11	0.05	0.04	0.03	N/A
Loli											
Mokulēʻia	*Dry*	1	7	3.08	0.087	0.087	0.087	N/A	N/A	0.03	N/A
	Wet	5	3	3.08	0.049	0.100	0.0846	0.021	0.009	0.03	N/A

Table G-3: Comparison of Dioxins/Dibenzofurans Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV[1] *(ng/kg-wet)*	Minimum *(ng/kg-wet)*	Maximum *(ng/kg-wet)*	Mean[2] *(ng/kg-wet)*	SD (ng/kg-wet)	SEM (ng/kg-wet)	Mean:SV[3]	p-value[4]
Limu Kohu											
Mokulēʻia	*Dry*	1	7	3.08	0.064	0.064	0.064	N/A	N/A	0.02	N/A
Kaʻena Point	*Wet*	2	6	3.08	0.018	0.024	0.021	0.004	0.003	0.01	N/A
1,2,3,7,8,9-HxCDD											
Loli											
Mākua	*Wet*	1	7	3.08	0.033	0.033	0.033	N/A	N/A	0.01	--
Mokulēʻia	*Dry*	1	7	3.08	0.096	0.096	0.096	N/A	N/A	0.03	N/A
	Wet	4	4	3.08	0.058	0.084	0.0678	0.012	0.006	0.02	N/A
Kaʻena Point	*Dry*	1	7	3.08	0.066	0.066	0.066	N/A	N/A	0.02	N/A
Limu Kohu											
Mākua	*Dry*	2	6	3.08	0.510	1.100	0.805	0.417	0.295	0.3	--
Mokulēʻia	*Dry*	2	6	3.08	0.32	0.55	0.44	0.16	0.12	0.1	0.349
Kaʻena Point	*Dry*	1	7	3.08	0.790	0.790	0.790	N/A	N/A	0.3	N/A
Total HxCDD											
Heʻe											
Mākua	*Dry*	1	7	3.08	0.14	0.14	0.14	N/A	N/A	0.05	--
	Wet	1	7	3.08	0.047	0.047	0.047	N/A	N/A	0.02	--
Mokulēʻia	*Dry*	6	2	3.08	0.079	0.27	0.13	0.08	0.03	0.04	N/A
Kaʻena Point	*Dry*	2	6	3.08	0.076	0.082	0.079	0.004	0.003	0.03	N/A
Loli											
Mākua	*Dry*	1	7	3.08	0.21	0.21	0.21	N/A	N/A	0.07	--
	Wet	1	7	3.08	0.037	0.037	0.037	N/A	N/A	0.01	--
Mokulēʻia	*Dry*	3	5	3.08	0.087	0.550	0.256	0.256	0.148	0.08	N/A
	Wet	5	3	3.08	0.058	0.3	0.1	0.1	0.0	0.05	N/A
Kaʻena Point	*Dry*	2	6	3.08	0.140	0.180	0.2	0.028	0.020	0.05	N/A
	Wet	2	6	3.08	0.039	0.046	0.043	0.005	0.004	0.01	N/A
Limu Kohu											
Mākua	*Dry*	1	7	3.08	0.250	0.250	0.250	N/A	N/A	0.08	--
Mokulēʻia	*Dry*	4	4	3.08	0.15	0.210	0.19	0.03	0.01	0.06	N/A
	Wet	1	7	3.08	0.20	0.20	0.20	N/A	N/A	0.06	N/A
Kaʻena Point	*Wet*	1	7	3.08	0.023	0.023	0.023	N/A	N/A	0.01	N/A
1,2,3,4,6,7,8-HpCDF											
Heʻe											
Mākua	*Dry*	1	7	30.8	0.068	0.068	0.068	N/A	N/A	0.002	--
Mokulēʻia	*Wet*	2	6	30.8	0.11	0.13	0.12	0.014	0.010	0.004	N/A
Kaʻena Point	*Wet*	1	7	30.8	0.064	0.064	0.064	N/A	N/A	0.002	N/A
Loli											
Mākua	*Wet*	4	4	30.8	0.031	0.065	0.053	0.015	0.007	0.002	--
Mokulēʻia	*Dry*	3	5	30.8	0.043	0.068	0.053	0.013	0.008	0.002	N/A
	Wet	4	4	30.8	0.041	0.075	0.058	0.016	0.008	0.002	0.765
Kaʻena Point	*Dry*	3	5	30.8	0.029	0.064	0.0427	0.019	0.011	0.001	N/A
	Wet	2	6	30.8	0.032	0.04	0.04	0.01	0.00	0.001	0.244
Limu Kohu											
Mākua	*Dry*	7	1	30.8	0.060	0.750	0.168	0.257	0.0971	0.005	--
	Wet	6	2	30.8	0.040	0.064	0.051	0.009	0.003	0.002	--
Mokulēʻia	*Dry*	8	0	30.8	0.080	0.130	0.111	0.015	0.005	0.004	0.989
	Wet	5	3	30.8	0.048	0.19	0.11	0.062	0.028	0.004	0.975
Kaʻena Point	*Dry*	8	0	30.8	0.064	0.110	0.086	0.014	0.005	0.003	0.926
	Wet	4	4	30.8	0.034	0.065	0.0488	0.017	0.008	0.002	0.462
1,2,3,4,7,8,9-HpCDF											
Loli											
Kaʻena Point	*Dry*	1	7	30.8	0.057	0.057	0.057	N/A	N/A	0.002	N/A
Limu Kohu											
Mākua	*Dry*	1	7	30.8	0.057	0.057	0.057	N/A	N/A	0.002	--
Mokulēʻia	*Wet*	1	7	30.8	0.048	0.048	0.048	N/A	N/A	0.002	N/A
Total HpCDF											
Heʻe											
Mākua	*Dry*	3	5	30.8	0.120	0.220	0.170	0.050	0.029	0.006	--
	Wet	1	7	30.8	0.100	0.100	0.100	N/A	N/A	0.003	--
Mokulēʻia	*Dry*	5	3	30.8	0.088	0.140	0.104	0.022	0.010	0.003	**0.0368**
	Wet	1	7	30.8	0.13	0.13	0.13	N/A	N/A	0.004	N/A
Kaʻena Point	*Dry*	7	1	30.8	0.043	0.370	0.107	0.118	0.044	0.003	0.0553
Loli											
Mākua	*Dry*	4	4	30.8	0.088	0.18	0.12	0.04	0.02	0.004	--
	Wet	1	7	30.8	0.056	0.056	0.056	N/A	N/A	0.002	--
Mokulēʻia	*Dry*	3	5	30.8	0.047	0.220	0.111	0.095	0.055	0.004	0.298
	Wet	2	6	30.8	0.067	0.075	0.071	0.006	0.004	0.002	N/A
Kaʻena Point	*Dry*	2	6	30.8	0.035	0.064	0.0495	0.021	0.015	0.002	0.0526
	Wet	1	7	30.8	0.040	0.040	0.040	N/A	N/A	0.001	N/A
Limu Kohu											
Mākua	*Dry*	6	2	30.8	0.057	4.500	0.831	1.798	0.734	0.03	--
	Wet	2	6	30.8	0.051	0.056	0.054	0.004	0.003	0.002	--
Mokulēʻia	*Dry*	7	1	30.8	0.080	0.240	0.157	0.070	0.026	0.01	0.824
	Wet	5	3	30.8	0.048	0.46	0.18	0.17	0.07	0.01	0.912
Kaʻena Point	*Dry*	6	2	30.8	0.063	0.11	0.09	0.02	0.01	0.003	0.405
	Wet	1	7	30.8	0.061	0.061	0.061	N/A	N/A	0.002	N/A

Table G-3: Comparison of Dioxins/Dibenzofurans Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV[1] *(ng/kg-wet)*	Minimum *(ng/kg-wet)*	Maximum *(ng/kg-wet)*	Mean[2] *(ng/kg-wet)*	SD (ng/kg-wet)	SEM (ng/kg-wet)	Mean:SV[3]	p-value[4]
1,2,3,4,6,7,8-HpCDD											
He ʻe											
Mākua	*Dry*	7	1	30.8	0.20	0.370	0.29	0.06	0.02	0.009	--
Mokulēʻia	*Dry*	1	7	30.8	1.20	1.20	1.20	N/A	N/A	0.039	N/A
	Wet	4	4	30.8	0.11	0.21	0.16	0.04	0.022	0.005	N/A
Kaʻena Point	*Wet*	2	6	30.8	0.052	0.087	0.070	0.025	0.018	0.002	N/A
Loli											
Mākua	*Dry*	6	2	30.8	0.14	0.460	0.22	0.12	0.05	0.007	--
	Wet	8	0	30.8	0.073	0.15	0.11	0.03	0.01	0.004	--
Mokulēʻia	*Dry*	6	2	30.8	0.110	0.890	0.398	0.341	0.139	0.013	0.811
	Wet	2	6	30.8	0.670	0.750	0.710	0.057	0.040	0.023	0.987
Kaʻena Point	*Dry*	5	3	30.8	0.100	0.27	0.15	0.07	0.03	0.005	**0.0407**
Limu Kohu											
Mākua	*Dry*	1	7	30.8	3.600	3.600	3.600	N/A	N/A	0.117	--
	Wet	6	2	30.8	0.045	0.100	0.077	0.021	0.009	0.002	--
Mokulēʻia	*Wet*	1	7	30.8	0.63	0.63	0.63	N/A	N/A	0.020	N/A
Kaʻena Point	*Wet*	2	6	30.8	0.17	0.300	0.24	0.09	0.07	0.008	0.985
Total HpCDD											
He ʻe											
Mākua	*Dry*	6	2	30.8	0.17	0.710	0.39	0.22	0.09	0.01	--
	Wet	7	1	30.8	0.070	0.210	0.135	0.047	0.018	0.004	--
Mokulēʻia	*Dry*	7	1	30.8	0.110	1.200	0.347	0.391	0.148	0.01	0.142
	Wet	4	4	30.8	0.14	0.17	0.16	0.02	0.01	0.01	0.853
Kaʻena Point	*Dry*	8	0	30.8	0.120	0.460	0.261	0.122	0.043	0.01	0.0979
	Wet	2	6	30.8	0.078	0.087	0.0825	0.006	0.005	0.003	0.153
Loli											
Mākua	*Dry*	8	0	30.8	0.140	0.67	0.29	0.17	0.06	0.010	--
	Wet	7	1	30.8	0.082	0.15	0.11	0.03	0.01	0.004	--
Mokulēʻia	*Dry*	7	1	30.8	0.110	1.700	0.634	0.643	0.243	0.021	0.851
	Wet	7	1	30.8	0.130	0.840	0.404	0.251	0.095	0.013	0.997
Kaʻena Point	*Dry*	4	4	30.8	0.100	0.27	0.17	0.08	0.04	0.006	0.117
	Wet	1	7	30.8	0.10	0.10	0.10	N/A	N/A	0.003	N/A
Limu Kohu											
Mākua	*Dry*	7	1	30.8	0.095	9.400	1.476	3.494	1.321	0.048	--
	Wet	6	2	30.8	0.075	0.15	0.11	0.03	0.01	0.004	--
Mokulēʻia	*Dry*	8	0	30.8	0.23	0.73	0.43	0.18	0.06	0.014	0.988
	Wet	7	1	30.8	0.11	1.20	0.52	0.48	0.18	0.017	0.995
Kaʻena Point	*Dry*	7	1	30.8	0.093	0.30	0.198	0.062	0.023	0.006	0.816
	Wet	6	2	30.8	0.084	0.870	0.289	0.305	0.125	0.009	0.936
OCDF											
He ʻe											
Mokulēʻia	*Wet*	1	7	1,030	0.38	0.38	0.38	N/A	N/A	0.0004	N/A
Loli											
Mākua	*Wet*	2	6	1,030	0.120	0.240	0.180	0.085	0.060	0.0002	--
Mokulēʻia	*Dry*	2	6	1,030	0.084	0.230	0.157	0.103	0.073	0.0002	N/A
	Wet	2	6	1,030	0.110	0.120	0.115	0.007	0.005	0.0001	0.207
Kaʻena Point	*Dry*	4	4	1,030	0.090	0.360	0.173	0.126	0.063	0.0002	N/A
	Wet	1	7	1,030	0.096	0.096	0.096	N/A	N/A	0.0001	N/A
Limu Kohu											
Mākua	*Dry*	1	7	1,030	10.000	10.000	10.000	N/A	N/A	0.0097	--
	Wet	1	7	1,030	0.120	0.120	0.120	N/A	N/A	0.0001	--
Mokulēʻia	*Wet*	3	5	1,030	0.24	0.54	0.42	0.16	0.09	0.0004	N/A
OCDD											
He ʻe											
Mokulēʻia	*Wet*	2	6	1,030	0.47	0.520	0.50	0.04	0.03	0.000	N/A
Kaʻena Point	*Wet*	3	5	1,030	0.310	0.82	0.51	0.27	0.16	0.000	N/A
Loli											
Mākua	*Wet*	3	5	1,030	0.610	0.73	0.66	0.06	0.04	0.001	--
Mokulēʻia	*Dry*	7	1	1,030	0.49	3.5	1.7	1.3	0.5	0.002	N/A
	Wet	5	3	1,030	1.6	2.300	1.9	0.3	0.1	0.002	0.992
Kaʻena Point	*Dry*	5	3	1,030	0.440	1.00	0.61	0.23	0.10	0.001	N/A
Limu Kohu											
Mākua	*Dry*	1	7	1,030	60.000	60.000	60.000	N/A	N/A	0.058	--
	Wet	3	5	1,030	0.690	0.800	0.760	0.061	0.035	0.001	--
Mokulēʻia	*Dry*	1	7	1,030	2.60	2.60	2.60	N/A	N/A	0.003	N/A
	Wet	3	5	1,030	2.40	6.90	5.40	2.60	1.50	0.005	0.987
Kaʻena Point	*Wet*	2	6	1,030	0.55	6.700	3.63	4.35	3.08	0.004	0.614

Notes:

[1] Final screening values (SVs) from fish advisories as listed in Table 9 of the Final Supplemental Marine Resources Study Sampling and Analysis Plan (August 2013).

[2] **Bold** mean values exceed the SV.

[3] **Bold** mean/SV ratios are greater than 1.

[4] P-values <0.05 are **bolded** and indicates that mean concentration of samples collected from Mākua is significantly greater than the mean concentration of samples collected from Mokulēʻia or Kaʻena Point. P-values were only calculated if detections of an analyte occurred at Mākua and the background locations during the same sampling season.

ng/kg-wet - nanograms per kilogram-wet weight

N/A - not applicable

SD - standard deviation

SEM - standard error of the mean

Table G-4: Comparison of Metals Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV *(mg/kg-wet)*	Minimum *(mg/kg-wet)*	Maximum *(mg/kg-wet)*	Mean *(mg/kg-wet)*	SD *(mg/kg-wet)*	SEM *(mg/kg-wet)*	Mean:SV	p-value
Aluminum											
He ʻe											
Mākua	*Dry*	4	4	4,000	0.18	0.58	0.34	0.17	0.09	0.0001	--
	Wet	6	2	4,000	0.53	0.87	0.63	0.15	0.06	0.0002	--
Mokulēʻia	*Dry*	8	0	4,000	0.24	4.27	0.94	1.36	0.48	0.0002	0.867
Kaʻena Point	*Dry*	7	1	4,000	0.16	0.97	0.50	0.32	0.12	0.0001	0.746
Loli											
Mākua	*Dry*	8	0	4,000	0.35	9.46	2.76	3.17	1.12	0.0007	--
	Wet	8	0	4,000	0.68	15.4	7.1	5.5	1.9	0.0018	--
Mokulēʻia	*Dry*	8	0	4,000	0.35	2.84	1.11	0.86	0.31	0.0003	0.147
	Wet	8	0	4,000	1.84	11.4	6.2	3.9	1.4	0.0016	0.479
Kaʻena Point	*Dry*	8	0	4,000	0.22	2.75	0.92	0.87	0.31	0.0002	0.0639
	Wet	6	2	4,000	2.58	24.3	11.2	8.0	3.3	0.0028	0.817
Limu Kohu											
Mākua	*Dry*	8	0	4,000	20.9	87.6	42.1	21.4	7.6	0.0105	--
	Wet	8	0	4,000	25	438	202	193	68	0.0506	--
Mokulēʻia	*Dry*	8	0	4,000	117	630	344	164	58	0.0860	1
	Wet	8	0	4,000	45.7	838	258	289	102	0.0646	0.814
Kaʻena Point	*Dry*	8	0	4,000	31.6	334	213	90	32	0.0533	0.998
	Wet	8	0	4,000	21.1	164	103	49	17	0.0257	0.357
Antimony											
He ʻe											
Mākua	*Dry*	1	7	1.60	0.012	0.012	0.012	N/A	N/A	0.0075	--
Kaʻena Point	*Dry*	1	7	1.60	0.01	0.01	0.01	N/A	N/A	0.0063	NA
Loli											
Mākua	*Dry*	1	7	1.60	0.011	0.011	0.011	N/A	N/A	0.0069	--
Mokulēʻia	*Wet*	1	7	1.60	0.009	0.009	0.009	N/A	N/A	0.0056	NA
Limu Kohu											
Mākua	*Dry*	2	6	1.60	0.008	0.01	0.01	0.001	0.001	0.0056	--
	Wet	7	1	1.60	0.009	0.02	0.01	0.00	0.00	0.0071	--
Mokulēʻia	*Dry*	5	3	1.60	0.008	0.03	0.02	0.01	0.00	0.0098	0.888
	Wet	8	0	1.60	0.009	0.028	0.017	0.006	0.002	0.0105	0.981
Kaʻena Point	*Dry*	5	3	1.60	0.008	0.02	0.01	0.01	0.00	0.0066	0.5
	Wet	5	3	1.60	0.009	0.011	0.010	0.001	0.0004	0.0063	0.465
Arsenic											
He ʻe											
Mākua	*Dry*	8	0	Not defined	21.5	37.8	27.9	5.5	2.0	N/A	--
	Wet	8	0	Not defined	24.2	32.3	28.7	3.0	1.1	N/A	--
Mokulēʻia	*Dry*	8	0	Not defined	18.2	40.3	30.1	8.3	2.9	N/A	0.682
	Wet	8	0	Not defined	28.2	46.2	36.0	6.1	2.1	N/A	0.986
Kaʻena Point	*Dry*	8	0	Not defined	21.8	29.8	25.6	2.6	0.9	N/A	0.281
	Wet	8	0	Not defined	25.1	36.1	31.1	3.7	1.3	N/A	0.886
Loli											
Mākua	*Dry*	8	0	Not defined	0.294	0.719	0.479	0.122	0.043	N/A	--
	Wet	8	0	Not defined	0.34	0.75	0.50	0.13	0.05	N/A	--
Mokulēʻia	*Dry*	8	0	Not defined	0.483	16.6	4.9	5.7	2.0	N/A	0.995
	Wet	8	0	Not defined	0.396	1.38	0.90	0.33	0.12	N/A	0.995
Kaʻena Point	*Dry*	8	0	Not defined	0.38	18.5	6.4	8.4	3.0	N/A	0.958
	Wet	8	0	Not defined	0.374	1.11	0.66	0.23	0.08	N/A	0.948
Limu Kohu											
Mākua	*Dry*	8	0	Not defined	1.89	2.37	2.15	0.17	0.06	N/A	--
	Wet	8	0	Not defined	1.75	2.52	2.15	0.29	0.10	N/A	--
Mokulēʻia	*Dry*	8	0	Not defined	2.14	3.76	2.66	0.57	0.20	N/A	0.986
	Wet	8	0	Not defined	1.55	3.12	2.16	0.52	0.19	N/A	0.437
Kaʻena Point	*Dry*	8	0	Not defined	1.8	2.72	2.1	0.3	0.1	N/A	0.396
	Wet	8	0	Not defined	1.2	1.7	1.5	0.2	0.1	N/A	0.465
Barium											
Loli											
Mākua	*Dry*	5	3	800	0.04	0.06	0.05	0.01	0.005	0.0001	--
	Wet	8	0	800	0.04	0.11	0.07	0.03	0.01	0.0001	--
Mokulēʻia	*Dry*	5	3	800	0.05	0.07	0.06	0.01	0.005	0.0001	0.806
	Wet	8	0	800	0.07	0.24	0.14	0.06	0.02	0.0002	0.997
Kaʻena Point	*Dry*	5	3	800	0.04	0.08	0.06	0.01	0.01	0.0001	0.912
	Wet	8	0	800	0.04	0.28	0.16	0.08	0.03	0.0002	0.991
Limu Kohu											
Mākua	*Dry*	8	0	800	0.38	4.49	1.19	1.40	0.50	0.0015	--
	Wet	7	1	800	0.33	1.66	1.18	0.48	0.18	0.0015	--
Mokulēʻia	*Dry*	8	0	800	1.33	3.11	1.91	0.57	0.20	0.0024	0.988
	Wet	8	0	800	1.46	34.9	9.1	12.6	4.5	0.0114	0.998
Kaʻena Point	*Dry*	8	0	800	0.44	1.65	1.10	0.39	0.14	0.0014	0.886
	Wet	8	0	800	0.37	5.39	2.20	1.87	0.66	0.0028	0.837
Cadmium											
He ʻe											
Mākua	*Dry*	1	7	4.00	0.008	0.008	0.008	N/A	N/A	0.0020	--
	Wet	4	4	4.00	0.008	0.01	0.01	0.00	0.00	0.0022	--
Mokulēʻia	*Dry*	2	6	4.00	0.008	0.05	0.03	0.03	0.02	0.0073	N/A
	Wet	8	0	4.00	0.009	0.037	0.019	0.010	0.003	0.0048	0.995
Kaʻena Point	*Dry*	3	5	4.00	0.007	0.017	0.011	0.005	0.003	0.0028	N/A
	Wet	7	1	4.00	0.008	0.07	0.02	0.02	0.01	0.0055	0.94
Loli											
Kaʻena Point	*Wet*	1	7	4.00	0.034	0.034	0.034	N/A	N/A	0.0085	N/A
Limu Kohu											
Mākua	*Dry*	8	0	4.00	0.03	0.13	0.06	0.03	0.01	0.0138	--
	Wet	7	1	4.00	0.01	0.03	0.02	0.01	0.00	0.0054	--
Mokulēʻia	*Dry*	8	0	4.00	0.03	0.09	0.06	0.02	0.01	0.0141	0.739
	Wet	8	0	4.00	0.016	0.042	0.030	0.008	0.003	0.0076	0.973
Kaʻena Point	*Dry*	8	0	4.00	0.05	0.08	0.07	0.01	0.00	0.0175	0.989
	Wet	8	0	4.00	0.021	0.053	0.041	0.010	0.004	0.0102	0.999

Table G-4: Comparison of Metals Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV *(mg/kg-wet)*	Minimum *(mg/kg-wet)*	Maximum *(mg/kg-wet)*	Mean *(mg/kg-wet)*	SD *(mg/kg-wet)*	SEM *(mg/kg-wet)*	Mean:SV	p-value
Chromium											
He ʻe											
Mākua	*Dry*	1	7	0.08	0.298	0.298	**0.298**	N/A	N/A	**3.7**	--
	Wet	3	5	0.08	0.019	0.027	0.023	0.004	0.002	0.3	--
Mokulēʻia	*Dry*	1	7	0.08	0.388	0.388	**0.388**	N/A	N/A	**4.9**	N/A
	Wet	3	5	0.08	0.023	0.047	0.032	0.013	0.008	0.4	0.905
Kaʻena Point	*Dry*	1	7	0.08	0.192	0.192	**0.192**	N/A	N/A	**2.4**	N/A
	Wet	4	4	0.08	0.017	0.249	**0.144**	0.103	0.052	**1.8**	0.892
Loli											
Mākua	*Dry*	1	7	0.08	0.261	0.261	**0.261**	N/A	N/A	**3.3**	--
	Wet	8	0	0.08	0.046	0.326	**0.164**	0.084	0.030	**2.1**	--
Mokulēʻia	*Wet*	8	0	0.08	0.119	0.596	**0.274**	0.192	0.068	**3.4**	0.905
Kaʻena Point	*Wet*	8	0	0.08	0.046	0.317	**0.206**	0.087	0.031	**2.6**	0.896
Limu Kohu											
Mākua	*Dry*	8	0	0.08	0.17	0.528	**0.30**	0.14	0.05	**3.7**	--
	Wet	8	0	0.08	0.128	3.06	**1.38**	1.28	0.45	**17.2**	--
Mokulēʻia	*Dry*	8	0	0.08	0.766	4.19	**2.26**	1.01	0.36	**28.2**	1
	Wet	8	0	0.08	0.301	3.65	**1.28**	1.20	0.43	**16.0**	0.643
Kaʻena Point	*Dry*	8	0	0.08	0.164	2.24	**1.49**	0.63	0.22	**18.6**	0.995
	Wet	8	0	0.08	0.081	1.14	**0.66**	0.35	0.12	**8.3**	0.357
Cobalt											
Loli											
Mākua	*Dry*	1	7	1.60	0.026	0.026	0.026	N/A	N/A	0.016	--
	Wet	5	3	1.60	0.03	0.04	0.03	0.01	0.00	0.021	--
Mokulēʻia	*Wet*	8	0	1.60	0.038	0.056	0.047	0.006	0.002	0.029	0.997
Kaʻena Point	*Dry*	1	7	1.60	0.037	0.037	0.037	N/A	N/A	0.023	N/A
	Wet	5	3	1.60	0.019	0.068	0.045	0.021	0.009	0.028	0.898
Limu Kohu											
Mākua	*Dry*	8	0	1.60	0.03	0.1	0.06	0.02	0.01	0.040	--
	Wet	7	1	1.60	0.04	0.59	0.26	0.24	0.09	0.163	--
Mokulēʻia	*Dry*	8	0	1.60	0.09	0.32	0.19	0.07	0.03	0.116	0.999
	Wet	8	0	1.60	0.047	0.523	0.18	0.17	0.06	0.111	0.0586
Kaʻena Point	*Dry*	8	0	1.60	0.05	0.35	0.18	0.08	0.03	0.114	0.998
	Wet	8	0	1.60	0.037	0.149	0.10	0.04	0.01	0.061	0.301
Copper											
He ʻe											
Mākua	*Dry*	8	0	160	4.11	14.5	7.8	3.4	1.2	0.049	--
	Wet	8	0	160	4.14	7.8	6.7	1.2	0.4	0.042	--
Mokulēʻia	*Dry*	8	0	160	4.13	12.2	7.3	2.4	0.9	0.045	0.521
	Wet	8	0	160	4.39	40	10.0	12.1	4.3	0.063	0.114
Kaʻena Point	*Dry*	8	0	160	3.63	10.7	6.2	2.3	0.8	0.039	0.186
	Wet	8	0	160	4.49	15.3	7.5	3.3	1.2	0.047	0.357
Loli											
Mākua	*Dry*	8	0	160	0.31	10.3	2.0	3.5	1.2	0.012	--
	Wet	8	0	160	0.44	8.81	1.54	2.94	1.04	0.010	--
Mokulēʻia	*Dry*	8	0	160	0.35	52.7	8.8	18.1	6.4	0.055	0.842
	Wet	8	0	160	0.39	0.63	0.49	0.08	0.03	0.003	0.281
Kaʻena Point	*Dry*	8	0	160	0.4	12.4	2.4	4.2	1.5	0.015	0.922
	Wet	8	0	160	0.36	38.9	5.3	13.6	4.8	0.033	0.624
Limu Kohu											
Mākua	*Dry*	8	0	160	0.4	0.51	0.5	0.0	0.01	0.003	--
	Wet	7	1	160	0.51	1.18	0.79	0.29	0.11	0.005	--
Mokulēʻia	*Dry*	8	0	160	0.4	0.87	0.6	0.2	0.1	0.004	0.954
	Wet	8	0	160	0.47	1.17	0.70	0.27	0.10	0.004	0.177
Kaʻena Point	*Dry*	8	0	160	0.41	0.73	0.58	0.12	0.04	0.004	0.98
	Wet	8	0	160	0.35	0.73	0.51	0.11	0.04	0.003	**0.0212**
Iron											
He ʻe											
Mākua	*Wet*	8	0	2,800	0.901	2.78	1.42	0.61	0.22	0.001	--
Mokulēʻia	*Wet*	8	0	2,800	1.2	221	31	77	27	0.011	0.974
Kaʻena Point	*Wet*	8	0	2,800	1.16	3.6	2.1	0.8	0.3	0.001	0.958
Loli											
Mākua	*Dry*	5	3	2,800	4.18	19.8	8.7	6.5	2.9	0.003	--
	Wet	8	0	2,800	2.66	29.1	14.0	9.5	3.3	0.005	--
Mokulēʻia	*Dry*	3	5	2,800	3.5	6.34	4.53	1.58	0.91	0.002	0.117
	Wet	8	0	2,800	7.35	20.3	14.0	5.5	2.0	0.005	0.604
Kaʻena Point	*Dry*	2	6	2,800	3.34	14.7	9.0	8.0	5.7	0.003	0.423
	Wet	8	0	2,800	4.63	62.8	27.1	22.2	7.8	0.010	0.905
Limu Kohu											
Mākua	*Dry*	8	0	2,800	37	137	75	37	13	0.027	--
	Wet	8	0	2,800	36.9	957	440	411	145	0.157	--
Mokulēʻia	*Dry*	8	0	2,800	184	932	525	231	82	0.187	1
	Wet	8	0	2,800	66.7	1140	356	389	137	0.127	0.643
Kaʻena Point	*Dry*	8	0	2,800	46.6	761	455	217	77	0.162	0.997
	Wet	8	0	2,800	29.1	541	270	160	56	0.096	0.357
Lead											
He ʻe											
Mākua	*Dry*	8	0	Not defined	0.004	0.36	0.06	0.12	0.04	N/A	--
	Wet	8	0	Not defined	0.007	0.05	0.03	0.01	0.004	N/A	--
Mokulēʻia	*Dry*	8	0	Not defined	0.004	0.16	0.05	0.06	0.02	N/A	0.888
	Wet	4	4	Not defined	0.0046	0.345	0.14	0.14	0.07	N/A	0.905
Kaʻena Point	*Dry*	8	0	Not defined	0.007	0.07	0.02	0.02	0.01	N/A	0.901
	Wet	5	3	Not defined	0.045	0.778	0.22	0.32	0.14	N/A	0.998
Loli											
Mākua	*Dry*	8	0	Not defined	0.02	0.45	0.09	0.15	0.05	N/A	--
	Wet	8	0	Not defined	0.03	0.27	0.08	0.08	0.03	N/A	--
Mokulēʻia	*Dry*	8	0	Not defined	0.01	2.14	0.35	0.74	0.26	N/A	0.626
	Wet	8	0	Not defined	0.008	0.11	0.04	0.04	0.01	N/A	**0.0411**
Kaʻena Point	*Dry*	8	0	Not defined	0.02	0.42	0.13	0.14	0.05	N/A	0.667
	Wet	5	3	Not defined	0.078	2.25	0.57	0.94	0.42	N/A	0.998

Table G-4: Comparison of Metals Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV *(mg/kg-wet)*	Minimum *(mg/kg-wet)*	Maximum *(mg/kg-wet)*	Mean *(mg/kg-wet)*	SD *(mg/kg-wet)*	SEM *(mg/kg-wet)*	Mean:SV	p-value
Limu Kohu											
Mākua	*Dry*	8	0	Not defined	0.13	0.63	0.36	0.16	0.06	N/A	--
	Wet	8	0	Not defined	0.14	1.58	0.76	0.66	0.23	N/A	--
Mokulēʻia	*Dry*	8	0	Not defined	0.31	0.67	0.50	0.14	0.05	N/A	0.959
	Wet	8	0	Not defined	0.16	0.7	0.34	0.19	0.07	N/A	0.479
Kaʻena Point	*Dry*	8	0	Not defined	0.3	0.81	0.55	0.18	0.06	N/A	0.974
	Wet	8	0	Not defined	0.1	0.45	0.29	0.12	0.04	N/A	0.356
Manganese											
He ʻe											
Mākua	*Dry*	8	0	560	0.183	0.289	0.232	0.037	0.013	0.0004	--
	Wet	8	0	560	0.22	0.42	0.30	0.07	0.03	0.001	--
Mokulēʻia	*Dry*	8	0	560	0.233	0.339	0.269	0.034	0.012	0.0005	0.967
	Wet	8	0	560	0.229	0.389	0.301	0.062	0.022	0.001	0.563
Kaʻena Point	*Dry*	8	0	560	0.186	0.293	0.245	0.037	0.013	0.0004	0.814
	Wet	8	0	560	0.217	0.321	0.257	0.036	0.013	0.0005	0.113
Loli											
Mākua	*Dry*	4	4	560	0.189	0.39	0.25	0.09	0.05	0.0005	--
	Wet	8	0	560	0.18	0.71	0.36	0.19	0.07	0.001	--
Mokulēʻia	*Dry*	8	0	560	0.186	0.493	0.314	0.116	0.041	0.001	0.866
	Wet	8	0	560	0.303	0.804	0.55	0.21	0.08	0.001	0.959
Kaʻena Point	*Dry*	8	0	560	0.074	0.68	0.25	0.19	0.07	0.0005	0.466
	Wet	8	0	560	0.136	2.37	0.74	0.75	0.26	0.001	0.865
Limu Kohu											
Mākua	*Dry*	8	0	560	1.12	3.07	2.04	0.76	0.27	0.004	--
	Wet	7	1	560	1.1	12.5	5.9	5.5	2.1	0.011	--
Mokulēʻia	*Dry*	8	0	560	3.5	17.8	9.5	4.2	1.5	0.017	1
	Wet	8	0	560	1.93	27.4	7.5	8.8	3.1	0.013	0.807
Kaʻena Point	*Dry*	8	0	560	1.56	11.9	6.6	3.1	1.1	0.012	0.997
	Wet	8	0	560	0.973	4.77	3.42	1.32	0.47	0.006	0.523
Mercury											
He ʻe											
Mākua	*Dry*	8	0	1,200 ng/g	6.19 ng/g	17.4 ng/g	10.3 ng/g	3.5 ng/g	1.2 ng/g	0.009	--
	Wet	8	0	1,200 ng/g	8.41 ng/g	18.7 ng/g	13.4 ng/g	3.6 ng/g	1.3 ng/g	0.011	--
Mokulēʻia	*Dry*	8	0	1,200 ng/g	5.58 ng/g	16.4 ng/g	10.3 ng/g	3.6 ng/g	1.3 ng/g	0.009	0.396
	Wet	8	0	1,200 ng/g	8.96 ng/g	18.6 ng/g	13.3 ng/g	3.1 ng/g	1.1 ng/g	0.011	0.5
Kaʻena Point	*Dry*	8	0	1,200 ng/g	6.31 ng/g	13.4 ng/g	9.5 ng/g	2.3 ng/g	0.8 ng/g	0.008	0.282
	Wet	8	0	1,200 ng/g	8.11 ng/g	14.1 ng/g	11.1 ng/g	1.8 ng/g	0.6 ng/g	0.009	0.639
Loli											
Mākua	*Dry*	8	0	1,200 ng/g	0.18 ng/g	0.39 ng/g	0.28 ng/g	0.07 ng/g	0.02 ng/g	0.0002	--
	Wet	8	0	1,200 ng/g	0.16 ng/g	0.43 ng/g	0.28 ng/g	0.10 ng/g	0.03 ng/g	0.0002	--
Mokulēʻia	*Dry*	8	0	1,200 ng/g	0.22 ng/g	2.88 ng/g	1.27 ng/g	1.05 ng/g	0.37 ng/g	0.001	0.986
	Wet	8	0	1,200 ng/g	0.37 ng/g	3.12 ng/g	0.82 ng/g	0.93 ng/g	0.33 ng/g	0.001	0.999
Kaʻena Point	*Dry*	8	0	1,200 ng/g	0.19 ng/g	2.7 ng/g	0.9 ng/g	0.94 ng/g	0.33 ng/g	0.001	0.8
Limu Kohu											
Mākua	*Dry*	8	0	1,200 ng/g	1.71 ng/g	2.27 ng/g	2.02 ng/g	0.16 ng/g	0.06 ng/g	0.002	--
	Wet	8	0	1,200 ng/g	1.88 ng/g	3.67 ng/g	2.60 ng/g	0.58 ng/g	0.21 ng/g	0.002	--
Mokulēʻia	*Dry*	8	0	1,200 ng/g	2.16 ng/g	3.33 ng/g	2.70 ng/g	0.49 ng/g	0.17 ng/g	0.002	0.999
	Wet	8	0	1,200 ng/g	1.7 ng/g	4.38 ng/g	3.00 ng/g	0.99 ng/g	0.35 ng/g	0.002	0.753
Kaʻena Point	*Dry*	8	0	1,200 ng/g	1.02 ng/g	2.48 ng/g	1.86 ng/g	0.41 ng/g	0.15 ng/g	0.002	0.0946
	Wet	5	3	1,200 ng/g	2.25 ng/g	3.07 ng/g	2.54 ng/g	0.37 ng/g	0.17 ng/g	0.002	0.413
Methyl Mercury											
He ʻe											
Mākua	*Dry*	8	0	400 ng/g	5.35 ng/g	11.4 ng/g	8.2 ng/g	2.3 ng/g	0.8 ng/g	0.020	--
	Wet	8	0	400 ng/g	7.99 ng/g	15.9 ng/g	12.0 ng/g	2.8 ng/g	1.0 ng/g	0.030	--
Mokulēʻia	*Dry*	8	0	400 ng/g	4.25 ng/g	15.3 ng/g	8.7ng/g	3.4 ng/g	1.2 ng/g	0.022	0.604
	Wet	8	0	400 ng/g	7.2 ng/g	12.6 ng/g	10.3 ng/g	2.2 ng/g	0.8 ng/g	0.026	0.135
Kaʻena Point	*Dry*	8	0	400 ng/g	4.36 ng/g	10.6 ng/g	7.1 ng/g	2.3 ng/g	0.8 ng/g	0.018	0.186
	Wet	8	0	400 ng/g	6.4 ng/g	12.1 ng/g	8.9 ng/g	1.8 ng/g	0.6 ng/g	0.022	**0.0203**
Loli											
Mokulēʻia	*Dry*	1	7	400 ng/g	0.95 ng/g	0.95 ng/g	0.95 ng/g	N/A	N/A	0.002	N/A
Limu Kohu											
Mākua	*Dry*	1	7	400 ng/g	1.01 ng/g	1.01 ng/g	1.01 ng/g	N/A	N/A	0.003	--
Selenium											
He ʻe											
Mākua	*Dry*	8	0	20	0.159	0.294	0.242	0.043	0.015	0.012	--
	Wet	8	0	20	0.241	0.318	0.285	0.027	0.010	0.014	--
Mokulēʻia	*Dry*	8	0	20	0.226	0.353	0.281	0.042	0.015	0.014	0.943
Kaʻena Point	*Dry*	8	0	20	0.163	0.313	0.261	0.045	0.016	0.013	0.841
Loli											
Mākua	*Dry*	8	0	20	0.178	0.331	0.285	0.050	0.018	0.014	--
	Wet	8	0	20	0.238	0.574	0.348	0.107	0.038	0.017	--
Mokulēʻia	*Dry*	8	0	20	0.303	2.37	1.09	0.85	0.30	0.054	0.999
	Wet	8	0	20	0.36	0.62	0.50	0.10	0.04	0.025	0.995
Kaʻena Point	*Dry*	8	0	20	0.216	2.29	0.95	0.87	0.31	0.047	0.984
	Wet	8	0	20	0.34	0.68	0.48	0.10	0.04	0.024	0.988
Limu Kohu											
Mākua	*Wet*	1	7	20	0.063	0.063	0.063	N/A	N/A	0.003	--
Mokulēʻia	*Dry*	6	2	20	0.059	0.093	0.070	0.012	0.005	0.004	N/A
	Wet	3	5	20	0.08	0.11	0.09	0.02	0.01	0.005	N/A
Kaʻena Point	*Dry*	1	7	20	0.064	0.064	0.064	N/A	N/A	0.003	N/A
	Wet	5	3	20	0.1	0.12	0.11	0.007	0.003	0.006	N/A
Thallium											
Limu Kohu											
Mākua	*Dry*	8	0	0.04	0.003	0.007	0.005	0.001	0.001	0.122	--
	Wet	7	1	0.04	0.003	0.008	0.005	0.002	0.001	0.122	--
Mokulēʻia	*Dry*	6	2	0.04	0.004	0.006	0.005	0.001	0.0003	0.113	0.364
	Wet	8	0	0.04	0.003	0.008	0.005	0.002	0.001	0.116	0.575
Kaʻena Point	*Dry*	8	0	0.04	0.005	0.009	0.007	0.001	0.001	0.175	0.994
	Wet	8	0	0.04	0.003	0.006	0.005	0.001	0.0004	0.119	0.661

Table G-4: Comparison of Metals Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV *(mg/kg-wet)*	Minimum *(mg/kg-wet)*	Maximum *(mg/kg-wet)*	Mean *(mg/kg-wet)*	SD *(mg/kg-wet)*	SEM *(mg/kg-wet)*	Mean:SV	p-value
Vanadium											
He ʻe											
Mokulēʻia	*Wet*	1	7	20	0.016	0.016	0.016	N/A	N/A	N/A	N/A
Kaʻena Point	*Wet*	1	7	20	0.021	0.021	0.021	N/A	N/A	N/A	N/A
Loli											
Mākua	*Dry*	8	0	20	0.018	0.077	0.034	0.019	0.007	0.002	--
	Wet	8	0	20	0.024	0.101	0.063	0.029	0.010	0.003	--
Mokulēʻia	*Dry*	8	0	20	0.026	0.075	0.040	0.016	0.006	0.002	0.877
	Wet	8	0	20	0.034	0.092	0.062	0.021	0.007	0.003	0.521
Kaʻena Point	*Dry*	8	0	20	0.017	0.053	0.033	0.013	0.004	0.002	0.583
	Wet	8	0	20	0.035	0.19	0.09	0.06	0.02	0.005	0.865
Limu Kohu											
Mākua	*Dry*	8	0	20	0.976	2.55	1.69	0.61	0.22	0.085	--
	Wet	8	0	20	1.11	3.86	2.43	1.18	0.42	0.122	--
Mokulēʻia	*Dry*	8	0	20	2.09	5.02	2.97	0.90	0.32	0.149	0.999
	Wet	8	0	20	1.29	8.41	3.12	2.31	0.82	0.156	0.718
Kaʻena Point	*Dry*	8	0	20	1.12	4.01	2.88	0.95	0.34	0.144	0.991
	Wet	8	0	20	0.906	2.9	2.0	0.7	0.3	0.102	0.264
Zinc											
He ʻe											
Mākua	*Dry*	8	0	1,200	9.9	14.1	12.0	1.3	0.5	0.010	--
	Wet	8	0	1,200	13.7	16.2	15.0	0.9	0.3	0.013	--
Mokulēʻia	*Dry*	8	0	1,200	13.4	16.1	14.1	1.0	0.3	0.012	0.998
	Wet	8	0	1,200	11.5	30	15	6	2	0.013	**0.0118**
Kaʻena Point	*Dry*	8	0	1,200	11.3	15.8	14.1	1.5	0.5	0.012	0.994
	Wet	8	0	1,200	12.3	20.5	14.0	2.7	0.9	0.012	**0.00669**
Loli											
Mākua	*Dry*	2	6	1,200	1.43	5.63	3.53	2.97	2.10	0.005	--
	Wet	1	7	1,200	20.3	20.3	20.3	N/A	N/A	0.017	--
Mokulēʻia	*Dry*	6	2	1,200	1.02	27.8	7.42	10.23	4.18	0.006	0.691
	Wet	5	3	1,200	1.19	1.84	1.61	0.26	0.12	0.001	N/A
Kaʻena Point	*Dry*	5	3	1,200	1.01	6.04	2.74	1.99	0.890	0.002	0.577
	Wet	8	0	1,200	0.61	21.6	3.4	7.3	2.6	0.003	N/A
Limu Kohu											
Mākua	*Dry*	8	0	1,200	1.84	3.48	2.22	0.53	0.19	0.002	--
	Wet	5	3	1,200	2.194	2.238	2.260	2.430	2.560	0.002	--
Mokulēʻia	*Dry*	8	0	1,200	1.64	2.64	1.96	0.33	0.12	0.002	0.113
	Wet	8	0	1,200	1.12	2.81	1.85	0.66	0.23	0.002	0.0819
Kaʻena Point	*Dry*	8	0	1,200	1.26	2.65	1.86	0.41	0.15	0.002	**0.033**
	Wet	7	1	1,200	0.6	1.88	1.05	0.48	0.18	0.001	**0.00288**

Notes:

[1] Final screening values (SVs) from fish advisories as listed in Table 9 of the Final Supplemental Marine Resources Study Sampling and Analysis Plan (August 2013).

[2] **Bold** mean values exceed the SV.

[3] **Bold** mean/SV ratios are greater than 1.

[4] P-values <0.05 are **bolded** and indicates that mean concentration of samples collected from Mākua is significantly greater than the mean concentration of samples collected from Mokulēʻia or Kaʻena Point. P-values were only calculated if detections of an analyte occurred at Mākua and the background locations during the same sampling season.

CV - coefficient of variation

MED - mean absolute deviation

mg/kg - milligrams per kilogram

N/A - not applicable

ng/g - nanograms per gram

SD - standard deviation

SEM - standard error of the mean

Table G-5: Comparison of Arsenic Speciation Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV[1] *(mg/kg-wet)*	Minimum *(mg/kg-wet)*	Maximum *(mg/kg-wet)*	Mean[2] *(mg/kg-wet)*	SD *(mg/kg-wet)*	SEM *(mg/kg-wet)*	Mean:SV[3]	p-value[4]
Inorganic Arsenic											
Loli											
Mākua	*Dry*	8	0	0.0267	0.007	0.034	0.015	0.009	0.003	0.57	--
	Wet	8	0	0.0267	0.006	0.071	**0.030**	0.023	0.008	**1.13**	--
Mokulēʻia	*Dry*	8	0	0.0267	0.008	0.024	0.016	0.006	0.002	0.60	0.77
	Wet	8	0	0.0267	0.015	0.072	**0.033**	0.019	0.007	**1.24**	0.753
Kaʻena Point	*Dry*	8	0	0.0267	0.008	0.019	0.013	0.004	0.002	0.49	0.356
	Wet	8	0	0.0267	0.006	0.071	**0.043**	0.024	0.009	**1.61**	0.841
Limu Kohu											
Mākua	*Dry*	8	0	0.0267	0.177	0.605	**0.303**	0.187	0.066	**11.35**	--
	Wet	8	0	0.0267	0.175	1.43	**0.680**	0.423	0.150	**25.47**	--
Mokulēʻia	*Dry*	8	0	0.0267	0.619	1.66	**1.101**	0.407	0.144	**41.24**	1
	Wet	8	0	0.0267	0.224	1.42	**0.740**	0.531	0.188	**27.72**	0.521
Kaʻena Point	*Dry*	8	0	0.0267	0.512	1.61	**1.013**	0.378	0.134	**37.94**	0.999
	Wet	8	0	0.0267	0.184	0.482	**0.361**	0.100	0.035	**13.52**	0.159
Arsenic (III)											
Loli											
Mākua	*Dry*	3	5	0.0267	0.005	0.010	0.007	0.003	0.002	0.26	--
	Wet	6	2	0.0267	0.006	0.019	0.012	0.005	0.002	0.45	--
Mokulēʻia	*Dry*	5	3	0.0267	0.004	0.019	0.011	0.006	0.003	0.41	0.883
	Wet	8	0	0.0267	0.006	0.021	0.010	0.005	0.002	0.37	0.325
Kaʻena Point	*Dry*	3	5	0.0267	0.011	0.016	0.014	0.003	0.001	0.52	0.985
	Wet	7	1	0.0267	0.006	0.019	0.010	0.005	0.002	0.37	0.333
Limu Kohu											
Mākua	*Dry*	8	0	0.0267	0.142	0.511	**0.254**	0.151	0.053	**9.51**	--
	Wet	8	0	0.0267	0.159	0.848	**0.517**	0.258	0.091	**19.36**	--
Mokulēʻia	*Dry*	8	0	0.0267	0.530	1.32	**0.906**	0.305	0.108	**33.93**	1
	Wet	8	0	0.0267	0.217	1.39	**0.661**	0.447	0.158	**24.76**	0.682
Kaʻena Point	*Dry*	8	0	0.0267	0.420	1.45	**0.891**	0.334	0.118	**33.37**	0.999
	Wet	8	0	0.0267	0.163	0.410	**0.305**	0.084	0.030	**11.42**	0.114
Arsenic (V)											
Heʻe											
Kaʻena Point	*Wet*	1	7	0.0267	0.004	0.004	0.004	N/A	N/A	0.15	N/A
Loli											
Mākua	*Dry*	8	0	0.0267	0.007	0.024	0.013	0.006	0.002	0.49	--
	Wet	8	0	0.0267	0.006	0.052	0.021	0.017	0.006	0.79	--
Mokulēʻia	*Dry*	7	1	0.0267	0.006	0.012	0.009	0.002	0.001	0.34	0.147
	Wet	8	0	0.0267	0.009	0.051	0.022	0.015	0.005	0.82	0.701
Kaʻena Point	*Dry*	5	3	0.0267	0.005	0.013	0.009	0.003	0.001	0.34	0.188
	Wet	8	0	0.0267	0.006	0.057	**0.034**	0.020	0.007	**1.27**	0.906

Table G-5: Comparison of Arsenic Speciation Mean Concentrations of Samples Collected from Mākua and the Two Background Locations

	Season	# of Detects	# of Non-Detects	SV[1] *(mg/kg-wet)*	Minimum *(mg/kg-wet)*	Maximum *(mg/kg-wet)*	Mean[2] *(mg/kg-wet)*	SD *(mg/kg-wet)*	SEM *(mg/kg-wet)*	Mean:SV[3]	p-value[4]
Limu Kohu											
Mākua	*Dry*	4	4	0.0267	0.035	0.126	**0.075**	0.042	0.021	**2.81**	--
	Wet	5	3	0.0267	0.106	0.581	**0.248**	0.191	0.086	**9.29**	--
Mokulēʻia	*Dry*	7	1	0.0267	0.089	0.535	**0.213**	0.150	0.057	**7.98**	0.985
	Wet	2	6	0.0267	0.236	0.332	**0.284**	0.068	0.048	**10.64**	0.912
Kaʻena Point	*Dry*	6	2	0.0267	0.087	0.189	**0.149**	0.047	0.019	**5.58**	0.973
	Wet	7	1	0.0267	0.041	0.082	**0.061**	0.014	0.005	**2.28**	**0.00288**
Dimethyl Arsenic											
Heʻe											
Mākua	*Dry*	8	0	Not defined	0.011	0.023	0.016	0.004	0.002	N/A	--
	Wet	8	0	Not defined	0.006	0.029	0.015	0.008	0.003	N/A	--
Mokulēʻia	*Dry*	8	0	Not defined	0.010	0.031	0.019	0.007	0.002	N/A	0.786
	Wet	8	0	Not defined	0.008	0.019	0.014	0.004	0.001	N/A	0.624
Kaʻena Point	*Dry*	8	0	Not defined	0.007	0.026	0.016	0.006	0.002	N/A	0.584
	Wet	8	0	Not defined	0.006	0.017	0.014	0.004	0.001	N/A	0.644
Loli											
Mākua	*Dry*	2	6	Not defined	0.005	0.008	0.007	0.002	0.002	N/A	--
	Wet	2	6	Not defined	0.005	0.006	0.006	0.001	0.001	N/A	--
Mokulēʻia	*Dry*	6	2	Not defined	0.005	0.016	0.008	0.004	0.002	N/A	0.75
Kaʻena Point	*Dry*	3	5	Not defined	0.006	0.008	0.007	0.001	0.001	N/A	0.834
	Wet	3	5	Not defined	0.005	0.006	0.006	0.001	0.0003	N/A	0.748
Limu Kohu											
Mākua	*Dry*	8	0	Not defined	0.209	0.352	0.291	0.055	0.020	N/A	--
	Wet	8	0	Not defined	0.175	0.293	0.227	0.038	0.013	N/A	--
Mokulēʻia	*Dry*	8	0	Not defined	0.103	0.300	0.238	0.065	0.023	N/A	**0.0416**
	Wet	8	0	Not defined	0.185	0.270	0.225	0.027	0.010	N/A	0.437
Kaʻena Point	*Dry*	8	0	Not defined	0.124	0.287	0.173	0.053	0.019	N/A	**9.7376E-04**
	Wet	8	0	Not defined	0.116	0.229	0.161	0.040	0.014	N/A	**0.00504**
Monomethyl Arsenic											
Heʻe											
Kaʻena Point	*Dry*	1	7	Not defined	0.007	0.007	0.007	N/A	N/A	N/A	N/A
Loli											
Kaʻena Point	*Wet*	1	7	Not defined	0.006	0.006	0.006	N/A	N/A	N/A	N/A
Limu Kohu											
Mākua	*Wet*	1	7	Not defined	0.032	0.032	0.032	N/A	N/A	N/A	--
Kaʻena Point	*Dry*	1	7	Not defined	0.011	0.011	0.011	N/A	N/A	N/A	NA

Notes:

[1] Final screening values (SVs) from fish advisories as listed in Table 9 of the Final Supplemental Marine Resources Study Sampling and Analysis Plan (August 2013).

[2] **Bold** mean values exceed the SV.

[3] **Bold** mean/SV ratios are greater than 1.

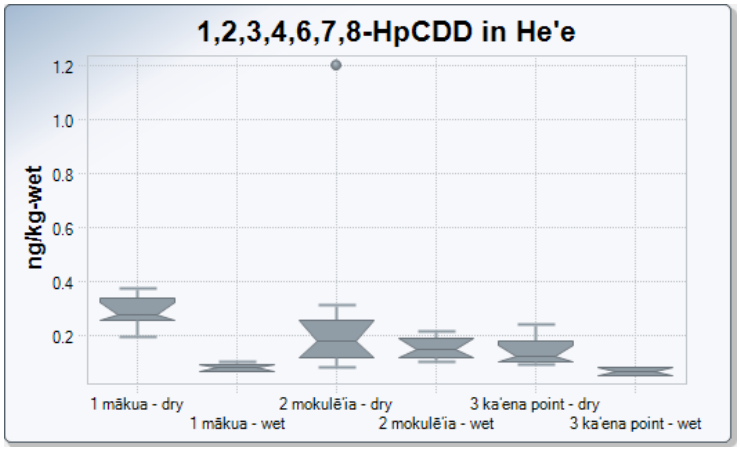
[4] P-values <0.05 are **bolded** and indicates that mean concentration of samples collected from Mākua is significantly greater than the mean concentration of samples collected from Mokulēʻia or Kaʻena Point. P-values were only calculated if detections of an analyte occurred at Mākua and the background locations during the same sampling season.

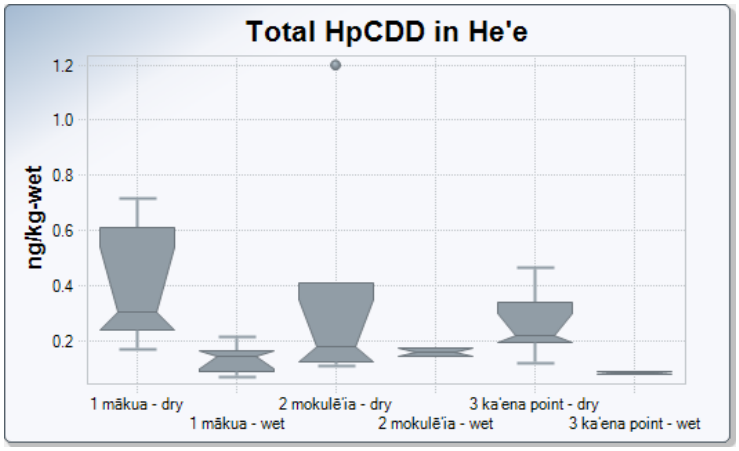
mg/kg-wet - milligrams per kilogram-wet weight

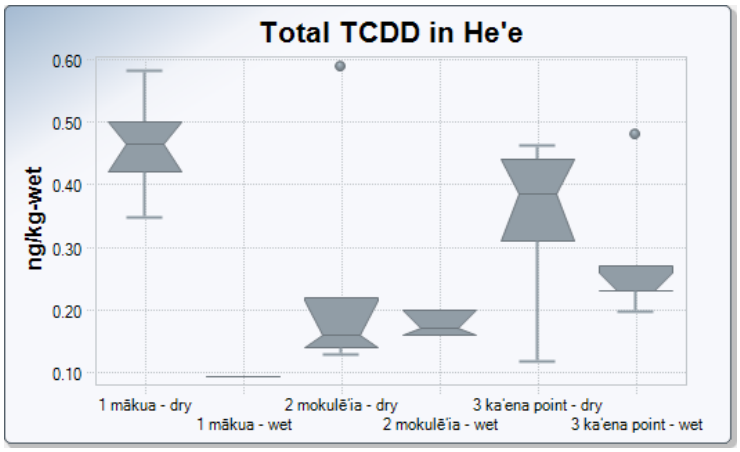
SD - standard deviation

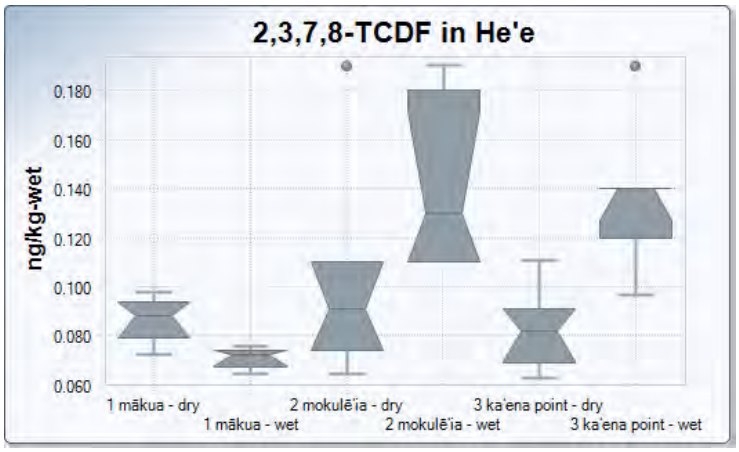
N/A - not applicable

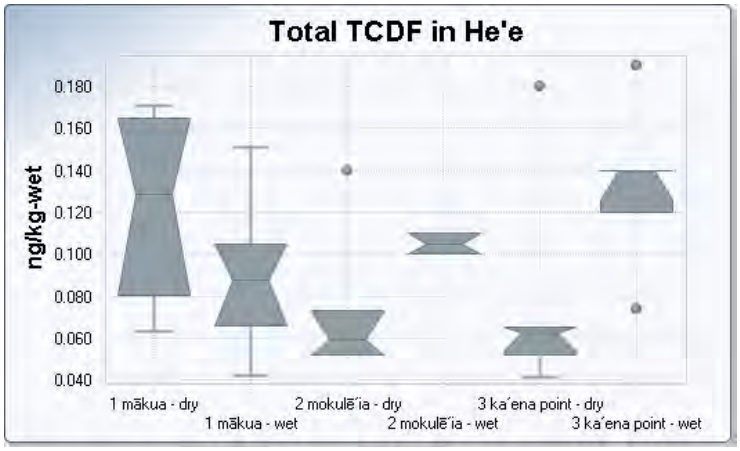
SEM - standard error of the mean

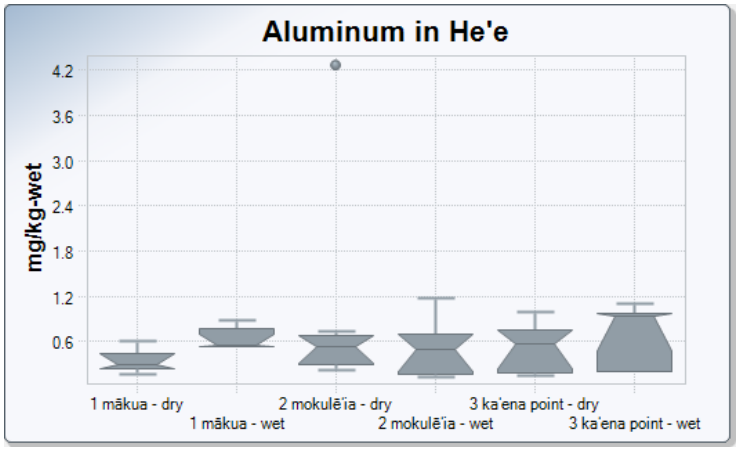

1,2,3,4,6,7,8-HpCDD in He'e
ng/kg-wet
1.2
1.0
0.8
0.6
0.4
0.2
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

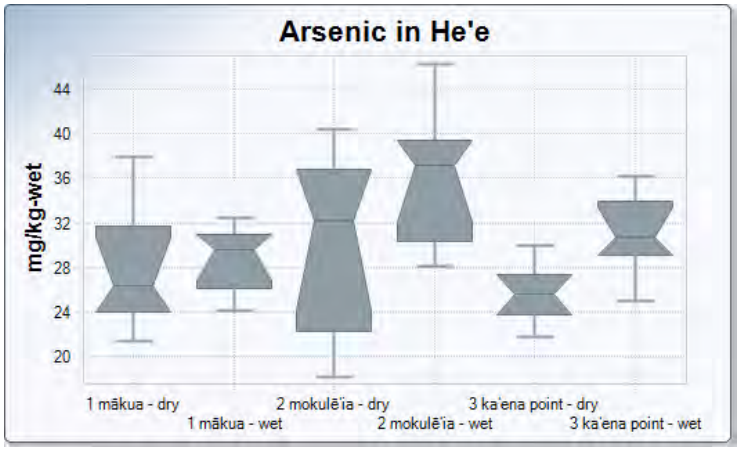

Total HpCDD in He'e
ng/kg-wet
1.2
1.0
0.8
0.6
0.4
0.2
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

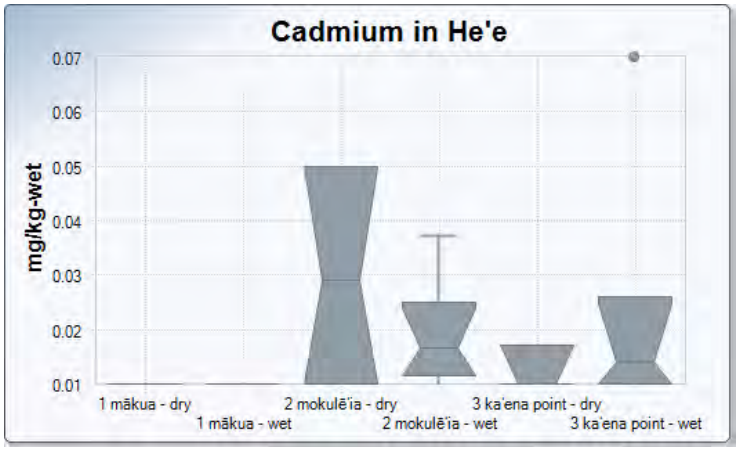

Total TCDD in He'e
ng/kg-wet
0.60
0.50
0.40
0.30
0.20
0.10
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

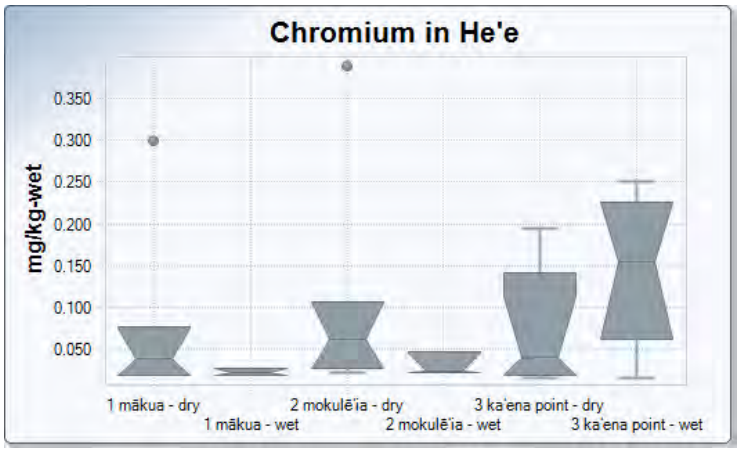

2,3,7,8-TCDF in He'e
ng/kg-wet
0.180
0.160
0.140
0.120
0.100
0.080
0.060
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

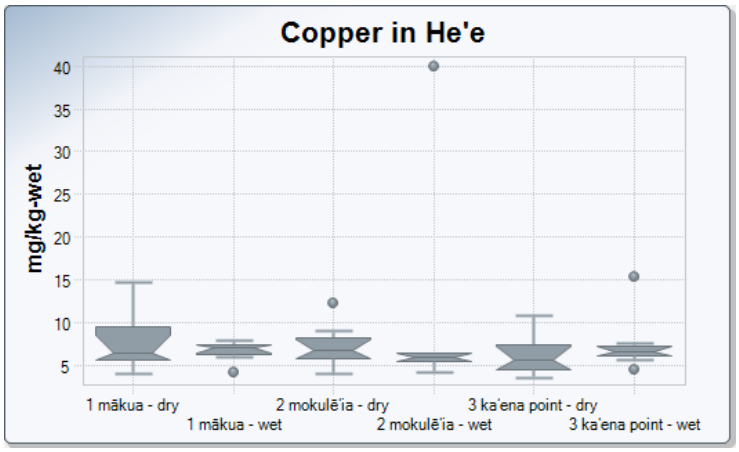

Total TCDF in He'e
ng/kg-wet
0.180
0.160
0.140
0.120
0.100
0.080
0.060
0.040
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

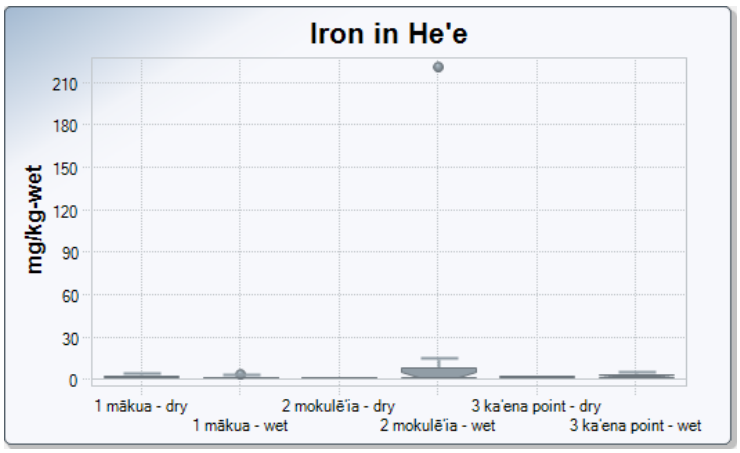

Aluminum in He'e
mg/kg-wet
4.2
3.6
3.0
2.4
1.8
1.2
0.6
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

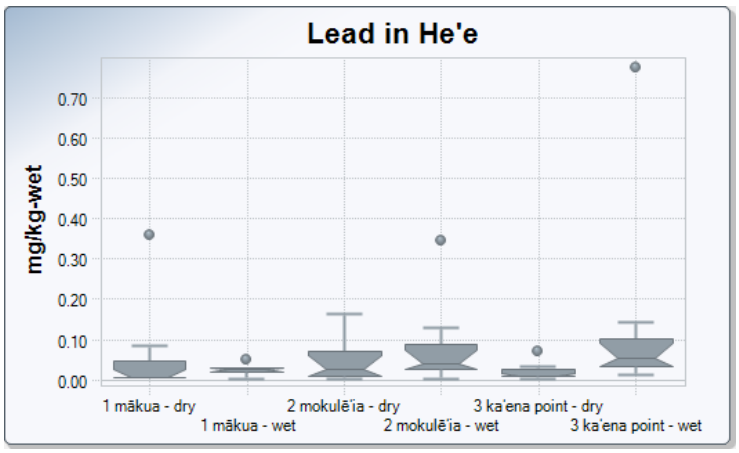

Arsenic in He'e
mg/kg-wet
44
40
36
32
28
24
20
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

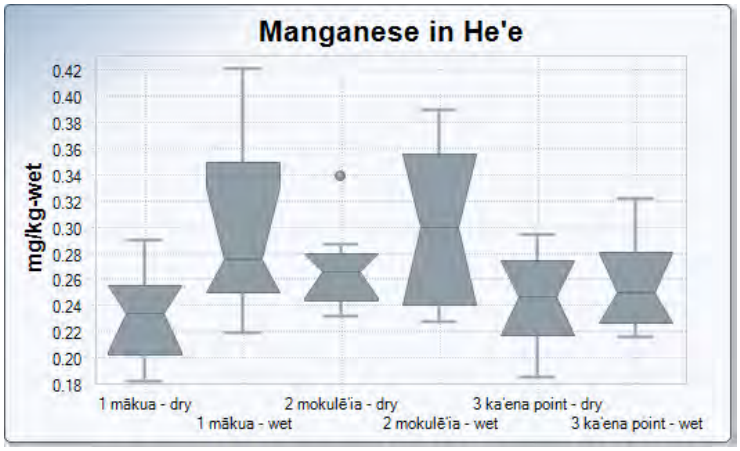

Cadmium in He'e
mg/kg-wet
0.07
0.06
0.05
0.04
0.03
0.02
0.01
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

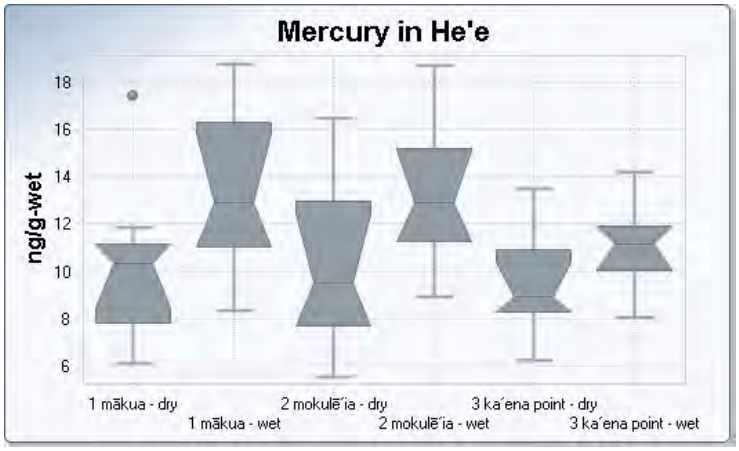

Chromium in He'e
mg/kg-wet
0.350
0.300
0.250
0.200
0.150
0.100
0.050
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

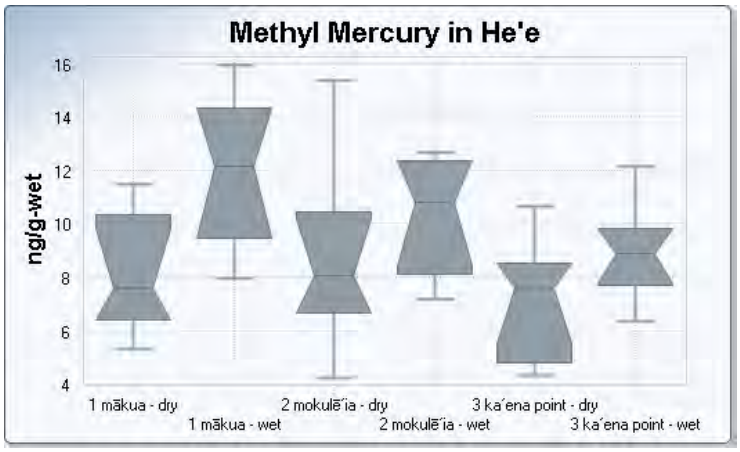

Copper in He'e
mg/kg-wet
40
35
30
25
20
15
10
5
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

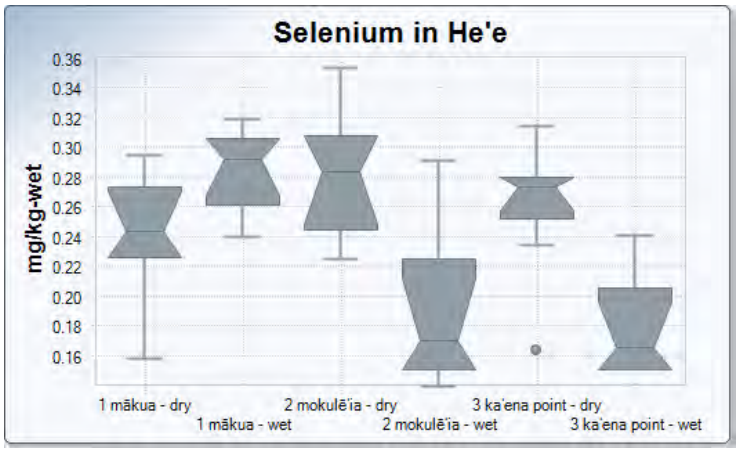

Iron in He'e
mg/kg-wet
210
180
150
120
90
60
30
0
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

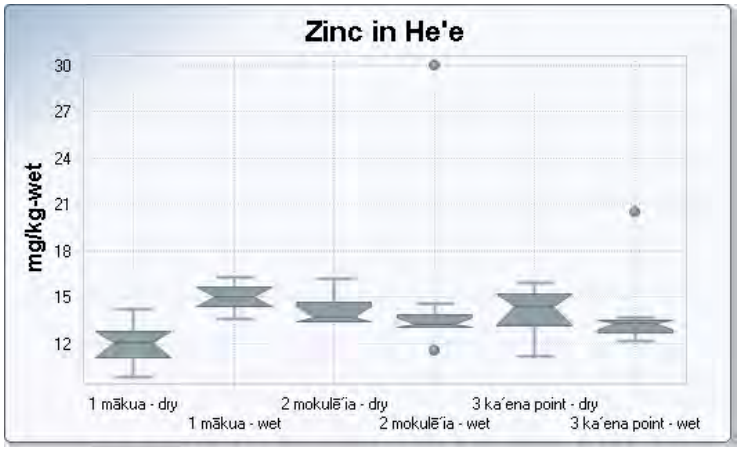

Lead in He'e
mg/kg-wet
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1 mākua - dry
1 mākua - wet
2 mokulēʻia - dry
2 mokulēʻia - wet
3 kaʻena point - dry
3 kaʻena point - wet

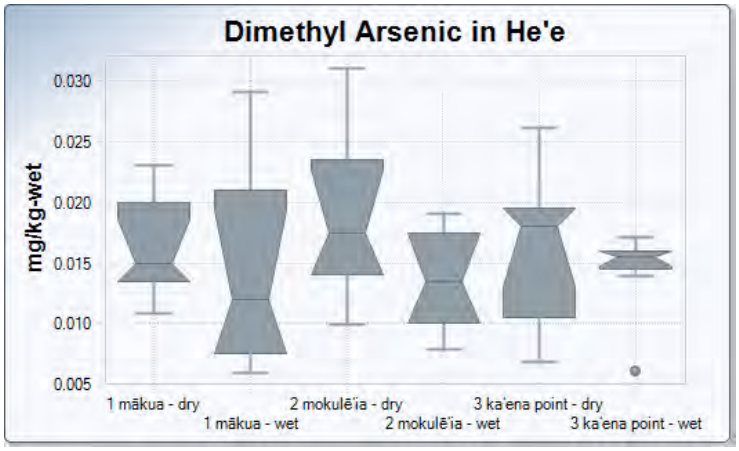

Manganese in He'e
mg/kg-wet
0.42
0.40
0.38
0.36
0.34
0.32
0.30
0.28
0.26
0.24
0.22
0.20
0.18
1 mākua - dry
1 mākua - wet
2 mokulē'ia - dry
2 mokulē'ia - wet
3 ka'ena point - dry
3 ka'ena point - wet

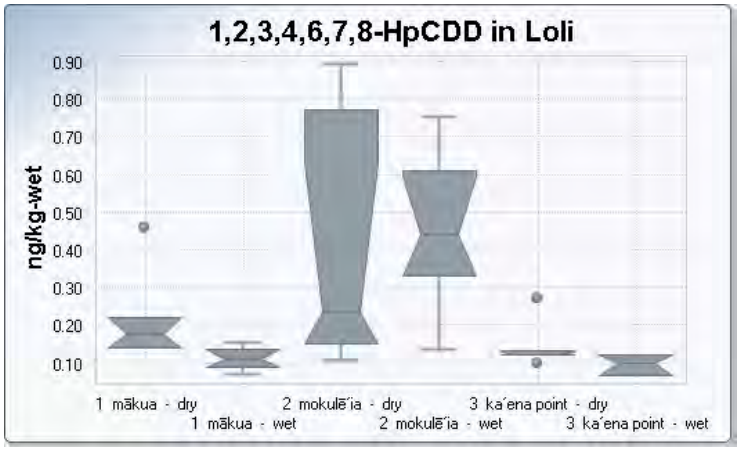

Mercury in He'e
ng/g-wet
18
16
14
12
10
8
6
1 mākua - dry
1 mākua - wet
2 mokulē'ia - dry
2 mokulē'ia - wet
3 ka'ena point - dry
3 ka'ena point - wet

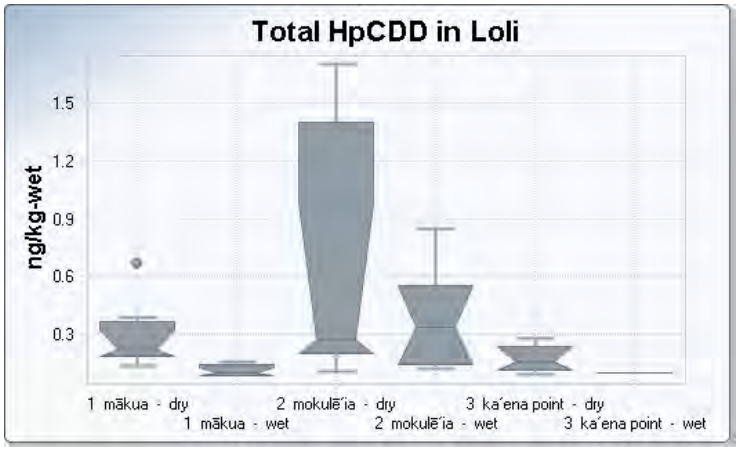

Methyl Mercury in He'e
ng/g-wet
16
14
12
10
8
6
4
1 mākua - dry
1 mākua - wet
2 mokulē'ia - dry
2 mokulē'ia - wet
3 ka'ena point - dry
3 ka'ena point - wet

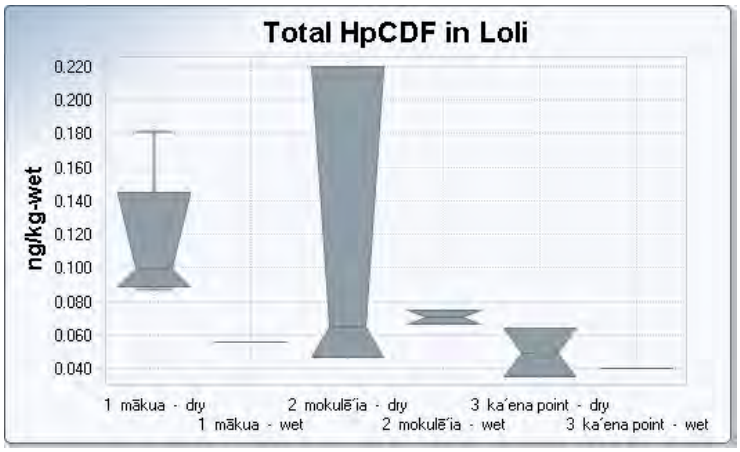

Selenium in He'e
mg/kg-wet
0.36
0.34
0.32
0.30
0.28
0.26
0.24
0.22
0.20
0.18
0.16
1 mākua - dry
1 mākua - wet
2 mokulē'ia - dry
2 mokulē'ia - wet
3 ka'ena point - dry
3 ka'ena point - wet

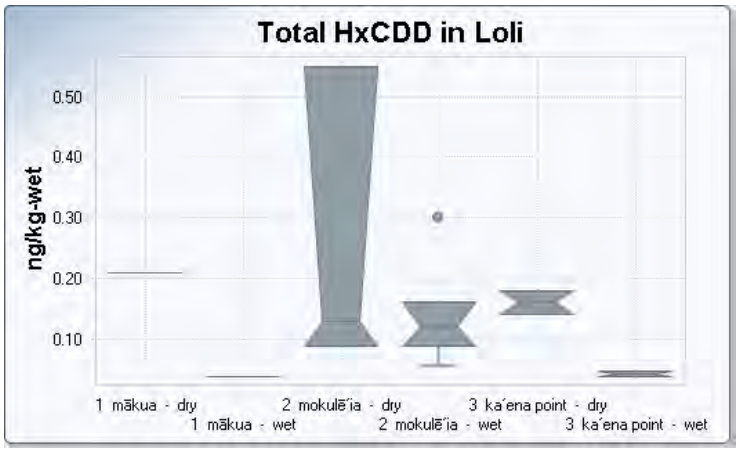

Zinc in He'e
mg/kg-wet
30
27
24
21
18
15
12
1 mākua - dry
1 mākua - wet
2 mokulē'ia - dry
2 mokulē'ia - wet
3 ka'ena point - dry
3 ka'ena point - wet

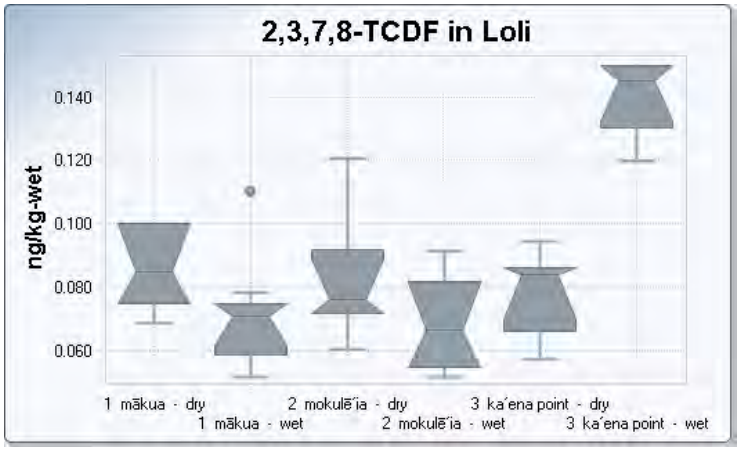

Dimethyl Arsenic in He'e
mg/kg-wet
0.030
0.025
0.020
0.015
0.010
0.005
1 mākua - dry
1 mākua - wet
2 mokulē'ia - dry
2 mokulē'ia - wet
3 ka'ena point - dry
3 ka'ena point - wet

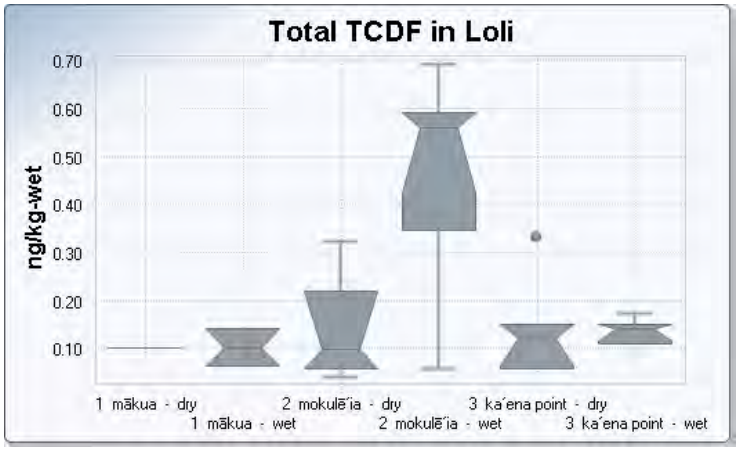

1,2,3,4,6,7,8-HpCDD in Loli
ng/kg-wet
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

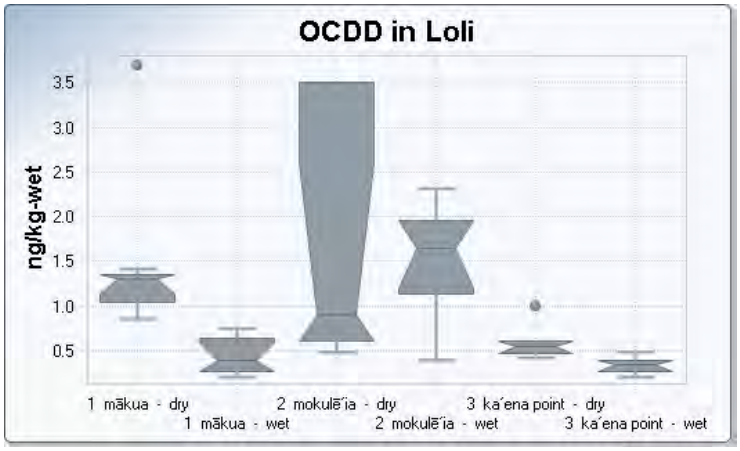

Total HpCDD in Loli
ng/kg-wet
1.5
1.2
0.9
0.6
0.3
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

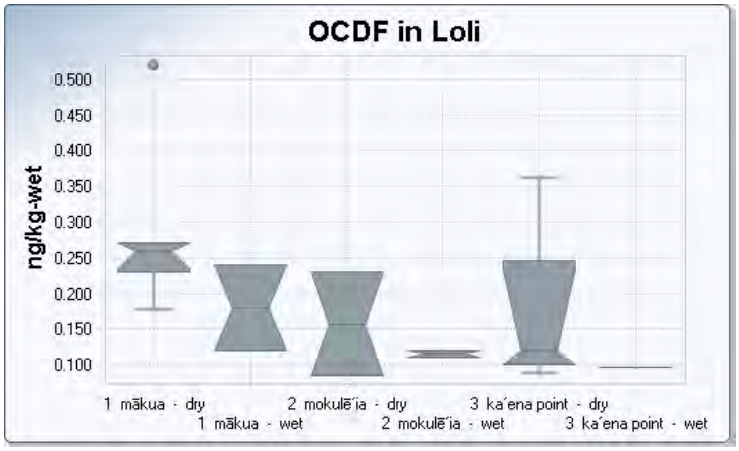

Total HpCDF in Loli
ng/kg-wet
0.220
0.200
0.180
0.160
0.140
0.120
0.100
0.080
0.060
0.040
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

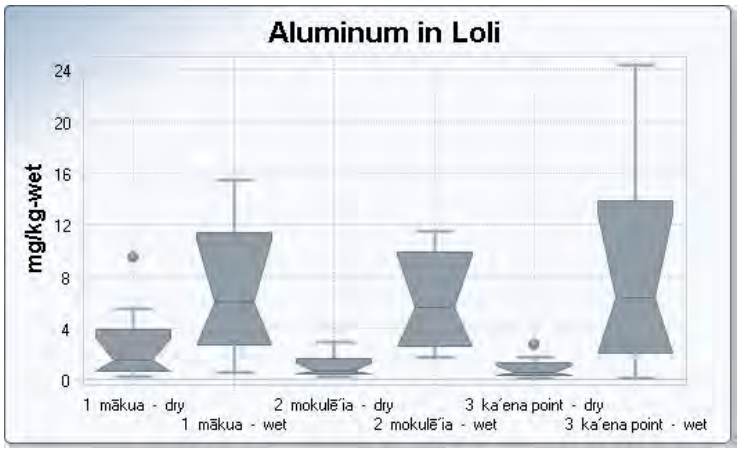

Total HxCDD in Loli
ng/kg-wet
0.50
0.40
0.30
0.20
0.10
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

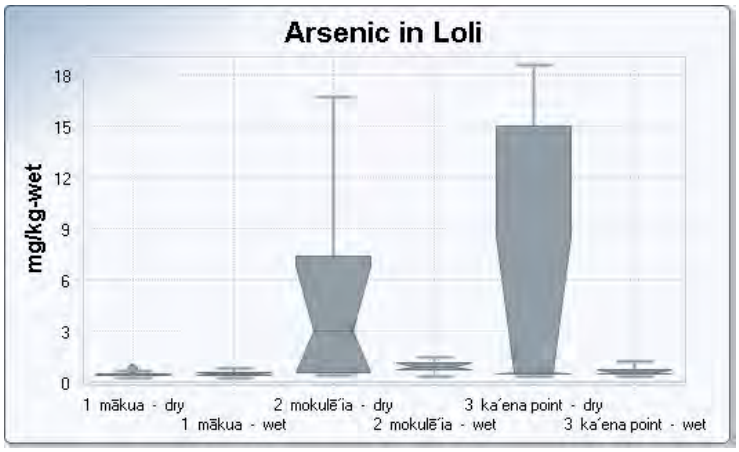

2,3,7,8-TCDF in Loli
ng/kg-wet
0.140
0.120
0.100
0.080
0.060
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

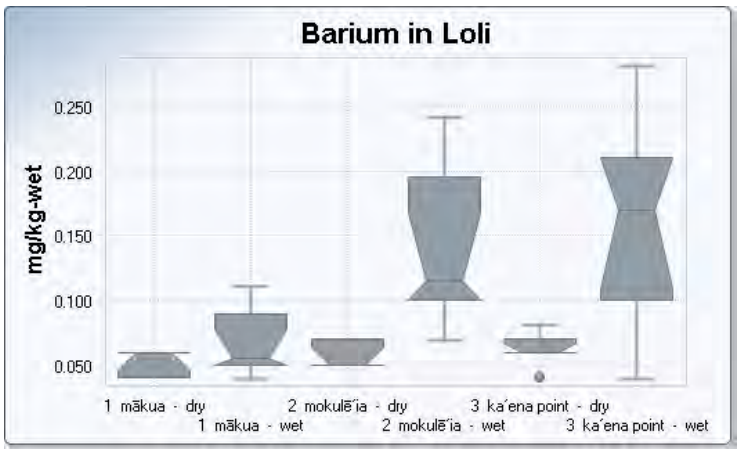

Total TCDF in Loli
ng/kg-wet
0.70
0.60
0.50
0.40
0.30
0.20
0.10
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

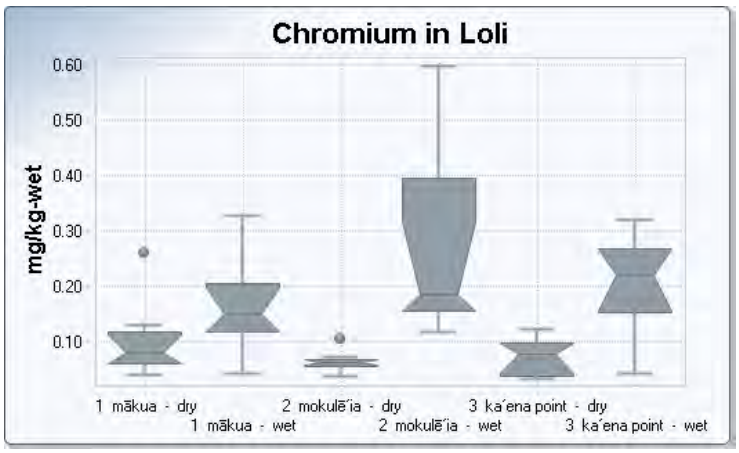

OCDD in Loli
ng/kg-wet
3.5
3.0
2.5
2.0
1.5
1.0
0.5
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

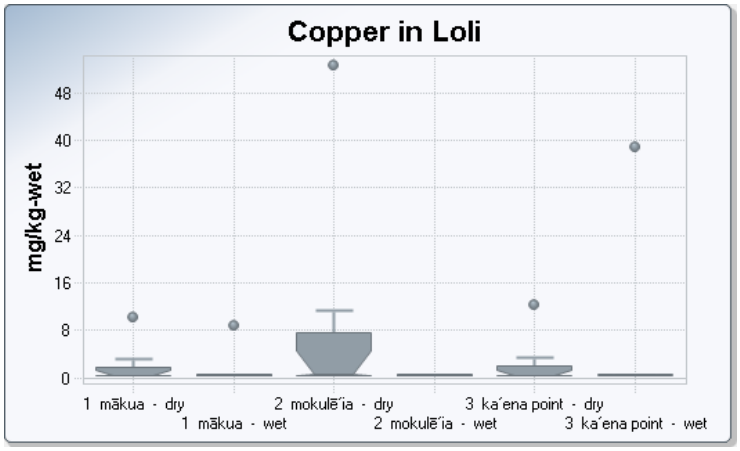

OCDF in Loli
ng/kg-wet
0.500
0.450
0.400
0.350
0.300
0.250
0.200
0.150
0.100
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

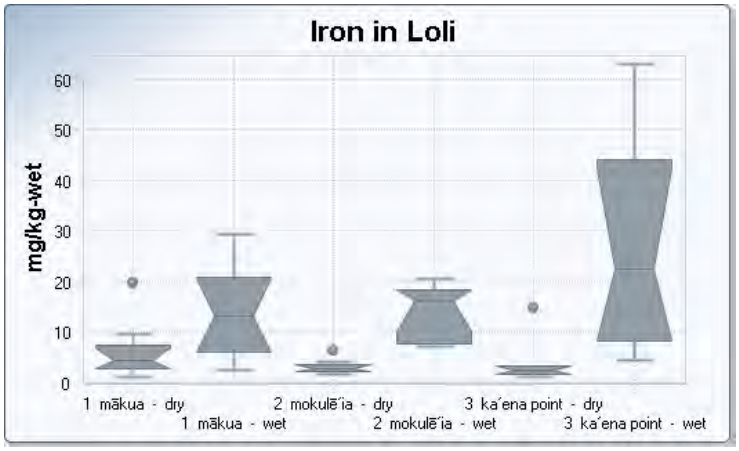

Aluminum in Loli
mg/kg-wet
24
20
16
12
8
4
0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

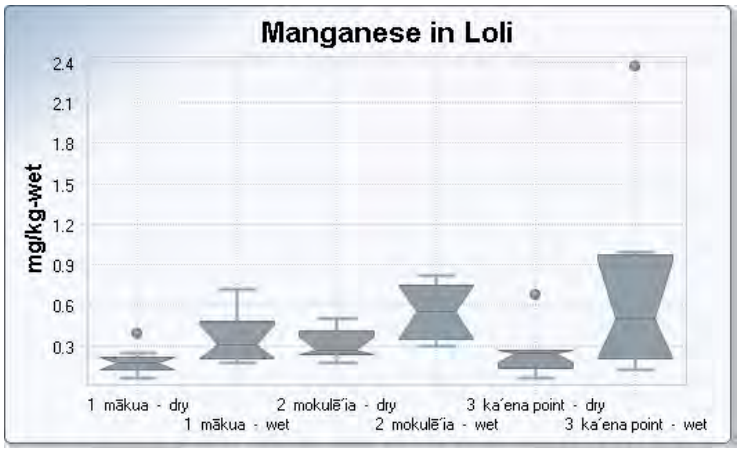

Arsenic in Loli
mg/kg-wet
18
15
12
9
6
3
0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

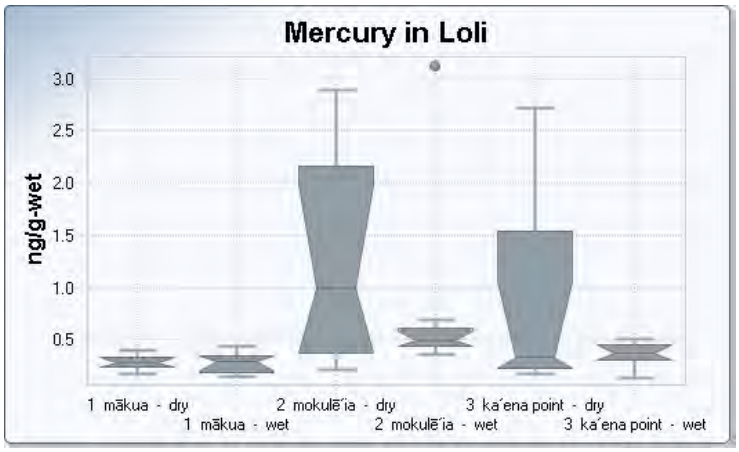

Barium in Loli
mg/kg-wet
0.250
0.200
0.150
0.100
0.050
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

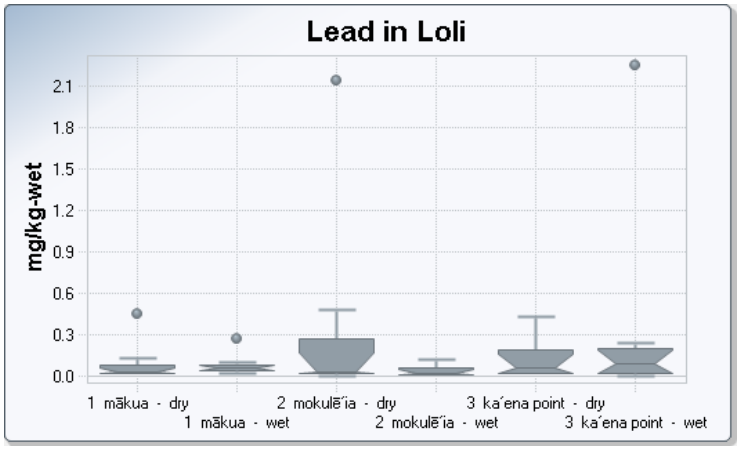

Chromium in Loli
mg/kg-wet
0.60
0.50
0.40
0.30
0.20
0.10
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

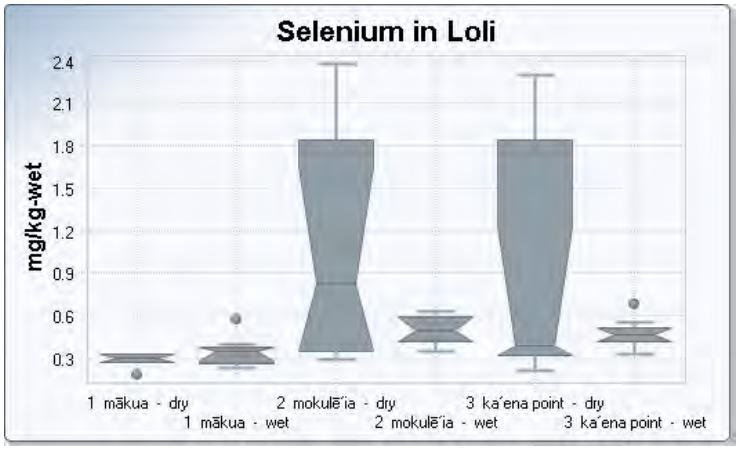

Copper in Loli
mg/kg-wet
48
40
32
24
16
8
0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

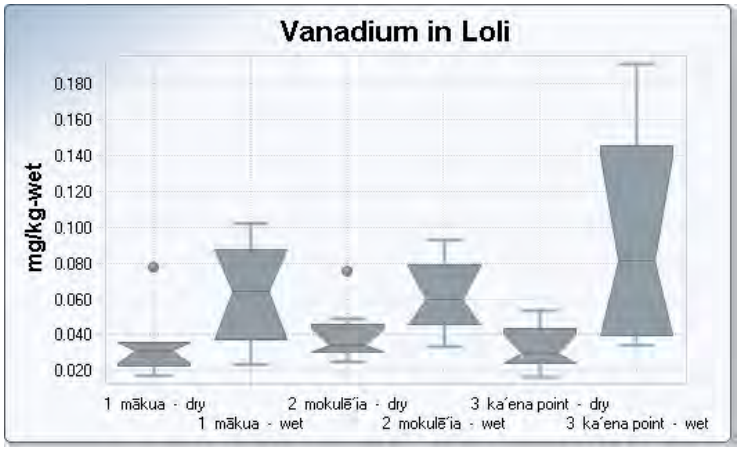

Iron in Loli
mg/kg-wet
60
50
40
30
20
10
0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

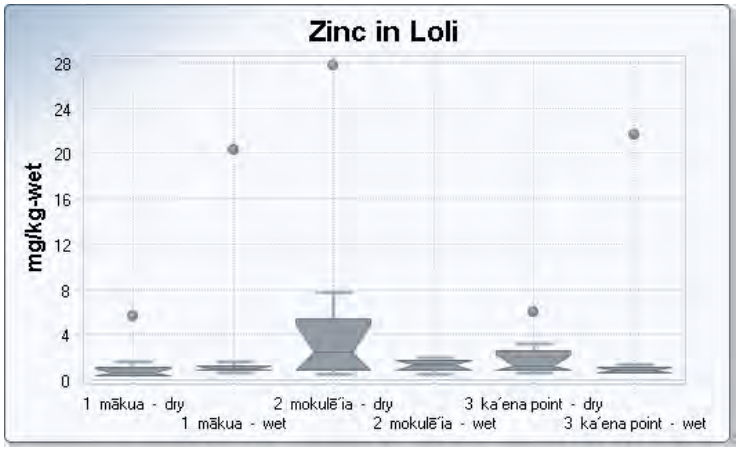

Manganese in Loli
mg/kg-wet
2.4
2.1
1.8
1.5
1.2
0.9
0.6
0.3
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

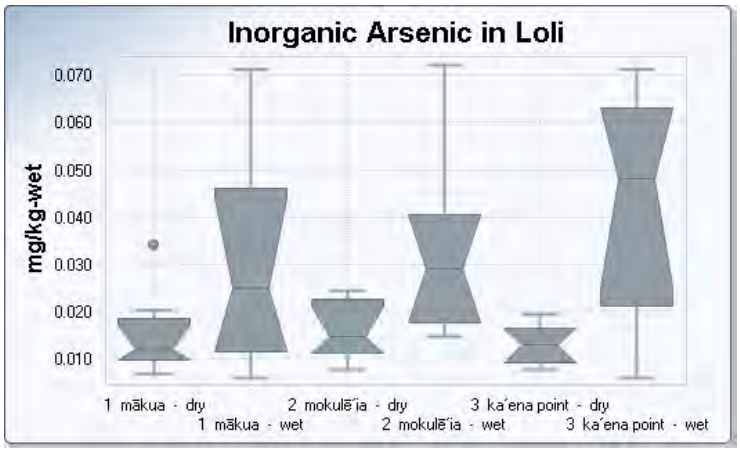

Mercury in Loli
ng/g-wet
3.0
2.5
2.0
1.5
1.0
0.5
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

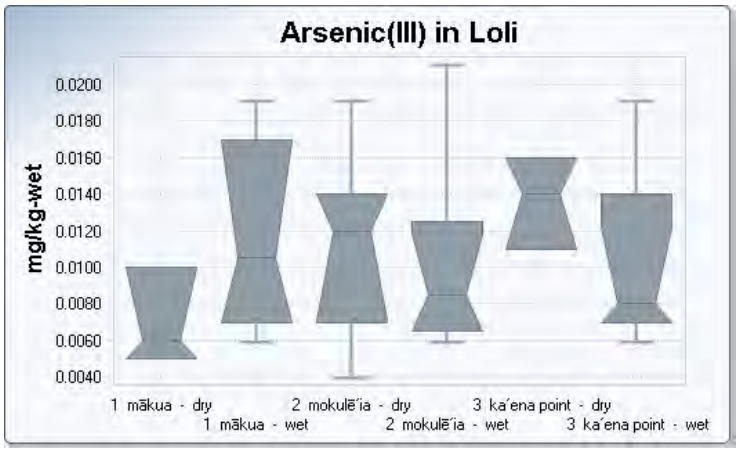

Lead in Loli
mg/kg-wet
2.1
1.8
1.5
1.2
0.9
0.6
0.3
0.0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

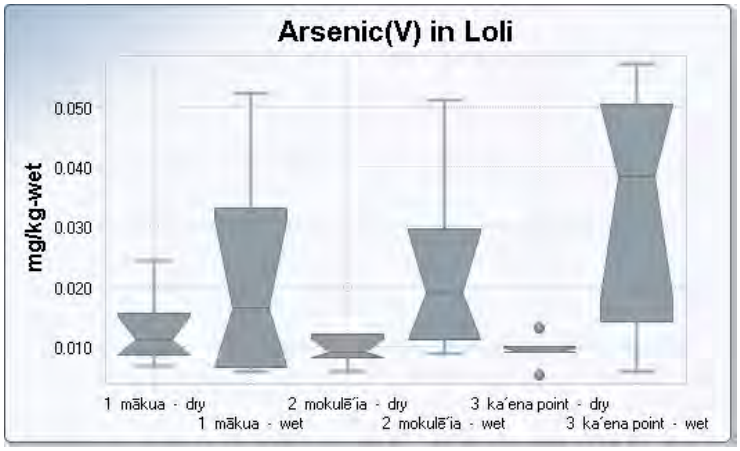

Selenium in Loli
mg/kg-wet
2.4
2.1
1.8
1.5
1.2
0.9
0.6
0.3
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

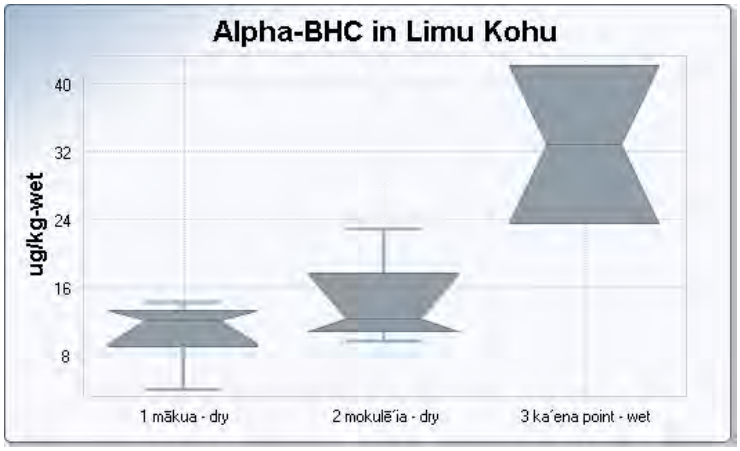

Vanadium in Loli
mg/kg-wet
0.180
0.160
0.140
0.120
0.100
0.080
0.060
0.040
0.020
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

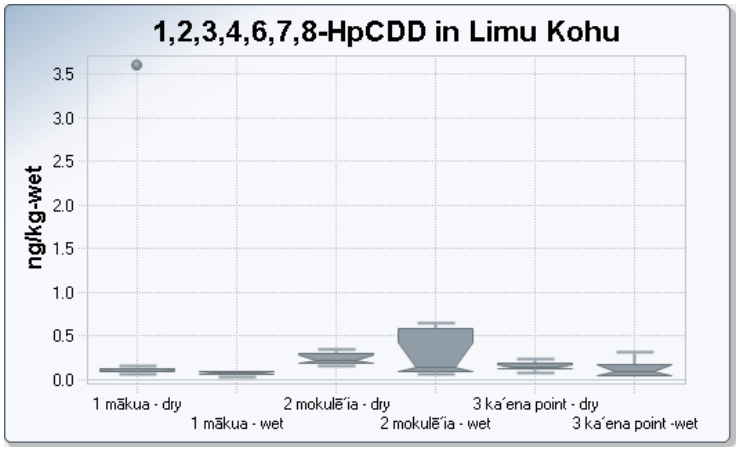

Zinc in Loli
mg/kg-wet
28
24
20
16
12
8
4
0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

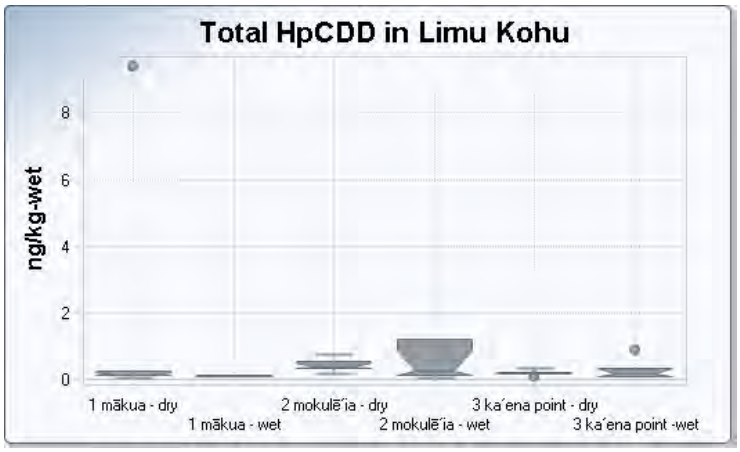

Inorganic Arsenic in Loli
mg/kg-wet
0.070
0.060
0.050
0.040
0.030
0.020
0.010
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

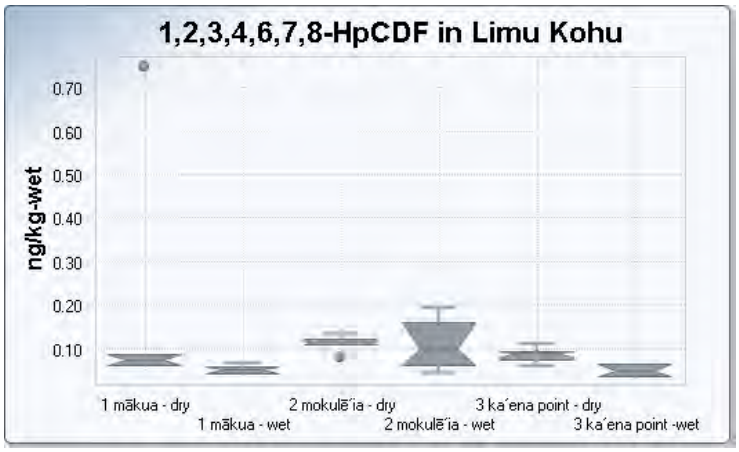

Arsenic(III) in Loli
mg/kg-wet
0.0200
0.0180
0.0160
0.0140
0.0120
0.0100
0.0080
0.0060
0.0040
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

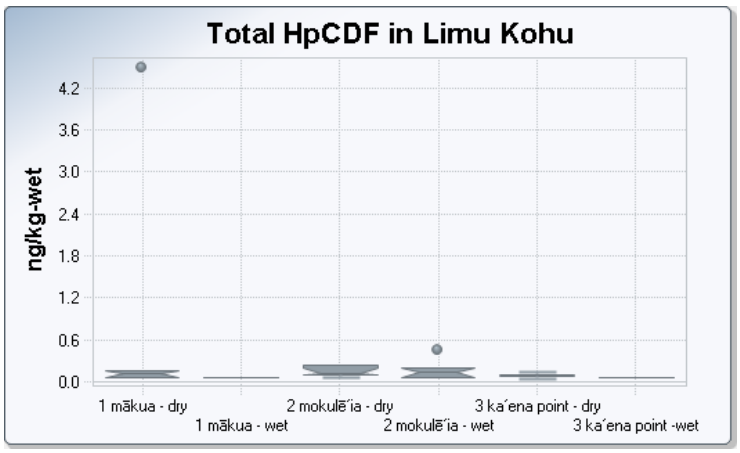

Arsenic(V) in Loli
mg/kg-wet
0.050
0.040
0.030
0.020
0.010
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point - wet

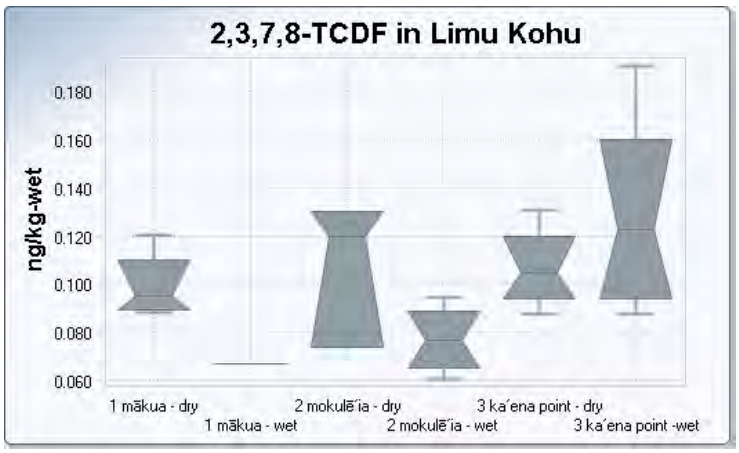

Alpha-BHC in Limu Kohu
ug/kg-wet
40
32
24
16
8
1 mākua - dry
2 mokulē´ia - dry
3 ka´ena point - wet

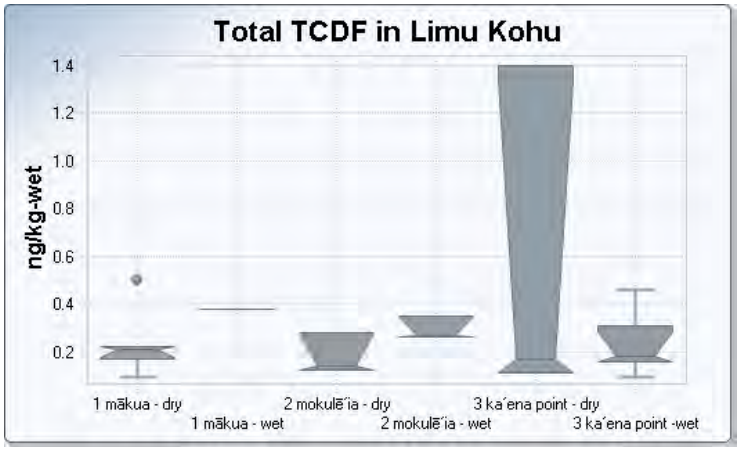

1,2,3,4,6,7,8-HpCDD in Limu Kohu
ng/kg-wet
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

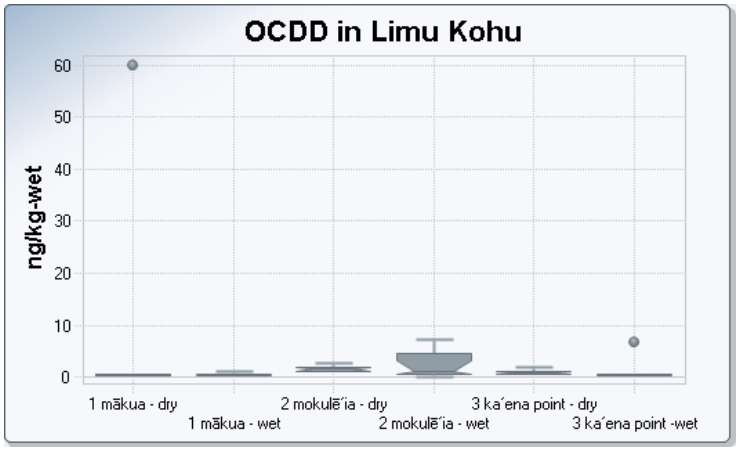

Total HpCDD in Limu Kohu
ng/kg-wet
8
6
4
2
0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

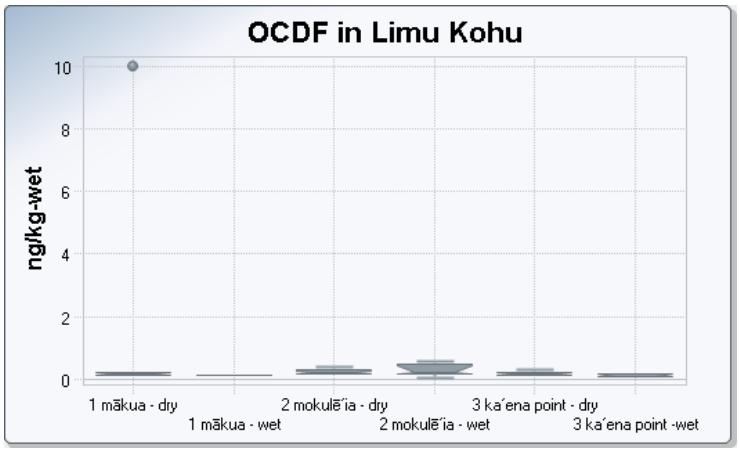

1,2,3,4,6,7,8-HpCDF in Limu Kohu
ng/kg-wet
0.70
0.60
0.50
0.40
0.30
0.20
0.10
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

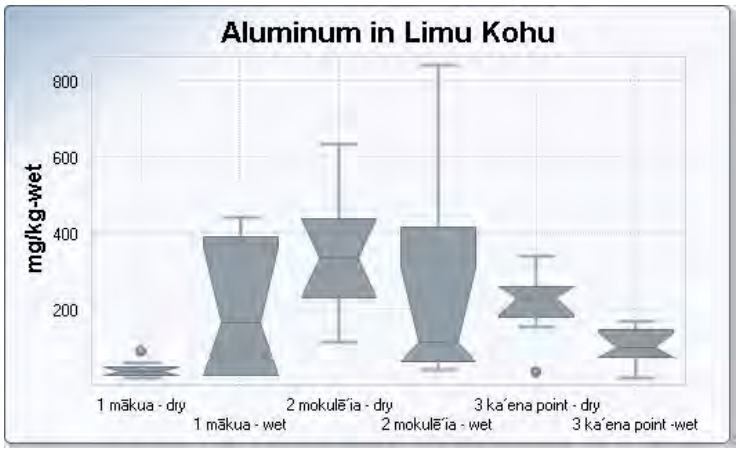

Total HpCDF in Limu Kohu
ng/kg-wet
4.2
3.6
3.0
2.4
1.8
1.2
0.6
0.0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

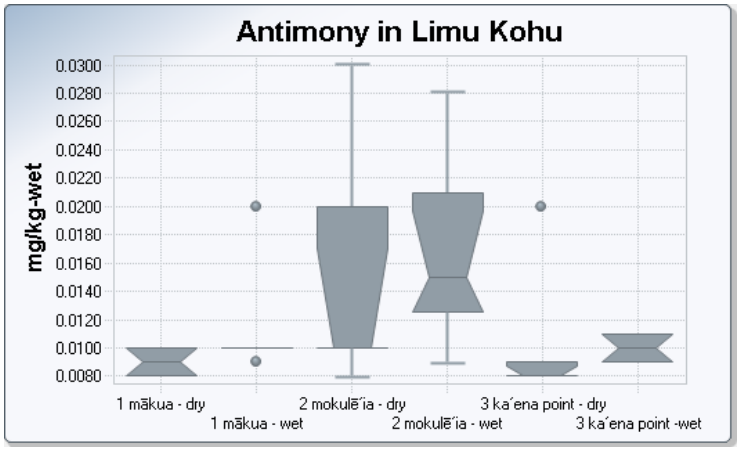

2,3,7,8-TCDF in Limu Kohu
ng/kg-wet
0.180
0.160
0.140
0.120
0.100
0.080
0.060
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

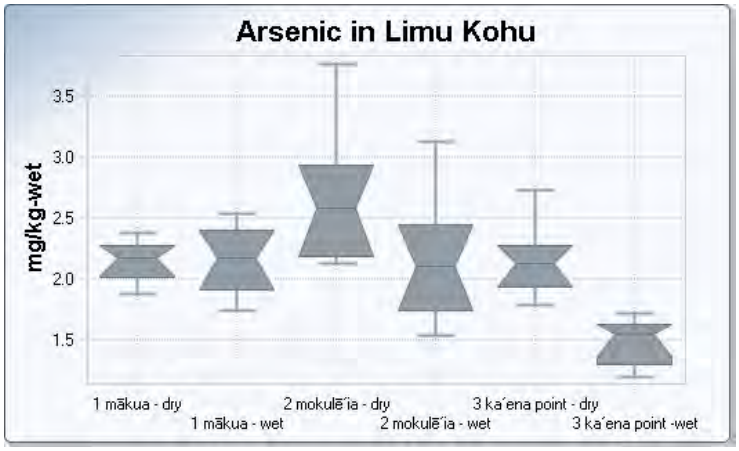

Total TCDF in Limu Kohu
ng/kg-wet
1.4
1.2
1.0
0.8
0.6
0.4
0.2
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

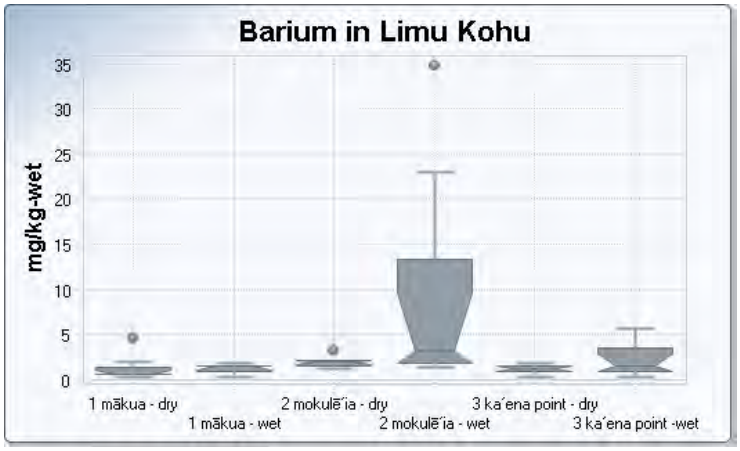

OCDD in Limu Kohu
ng/kg-wet
60
50
40
30
20
10
0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

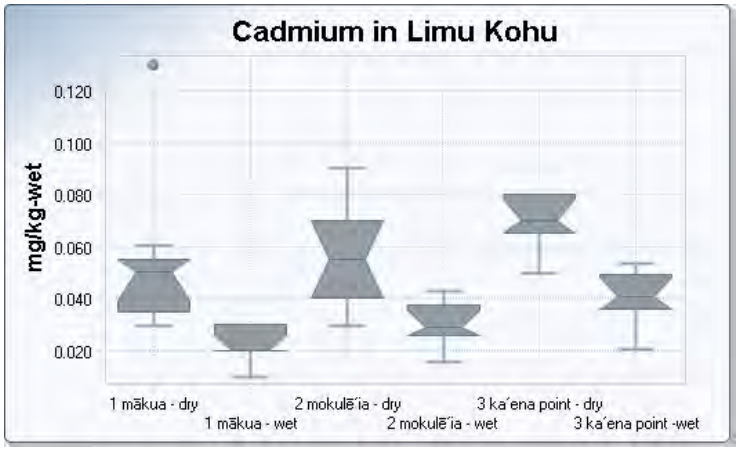

OCDF in Limu Kohu
ng/kg-wet
10
8
6
4
2
0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

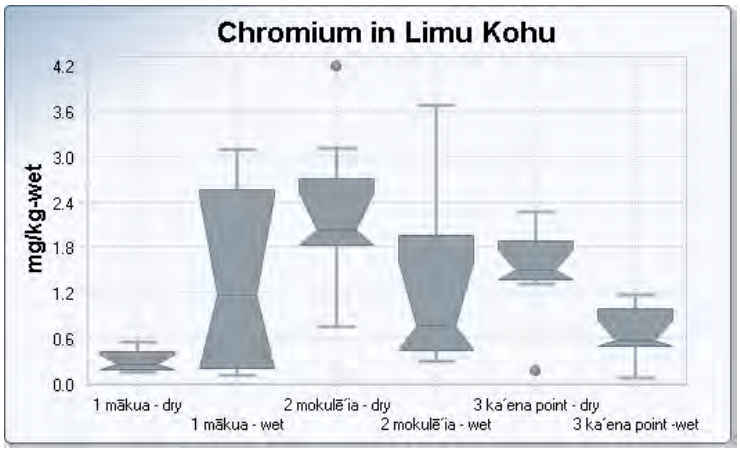

Aluminum in Limu Kohu
mg/kg-wet
800
600
400
200
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet


Antimony in Limu Kohu
mg/kg-wet
0.0300
0.0280
0.0260
0.0240
0.0220
0.0200
0.0180
0.0160
0.0140
0.0120
0.0100
0.0080
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

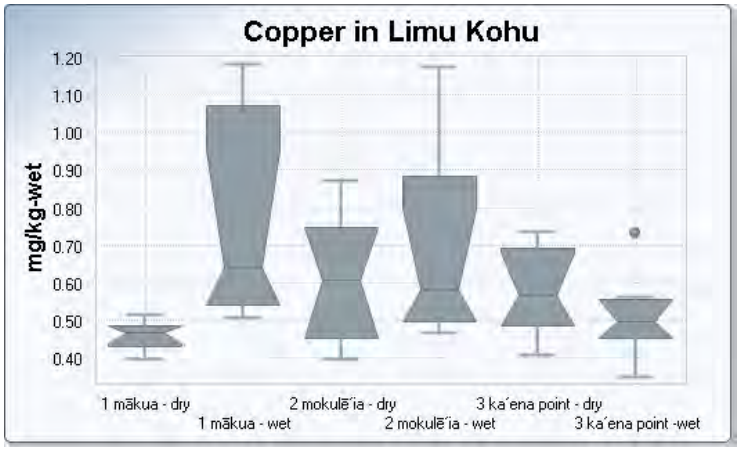

Arsenic in Limu Kohu
mg/kg-wet
3.5
3.0
2.5
2.0
1.5
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

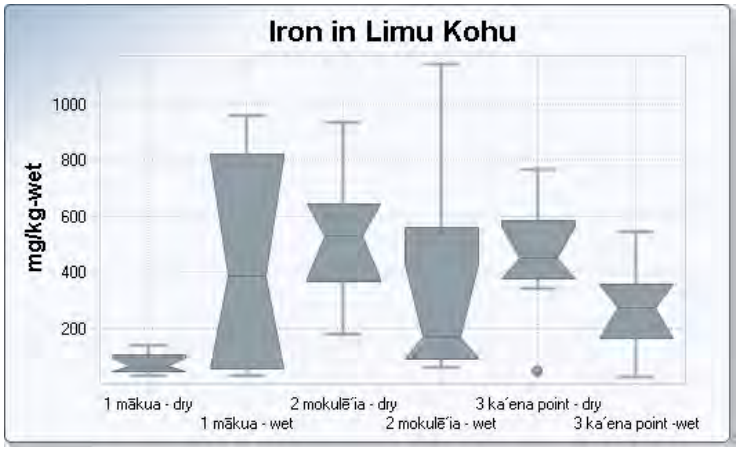

Barium in Limu Kohu
mg/kg-wet
35
30
25
20
15
10
5
0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

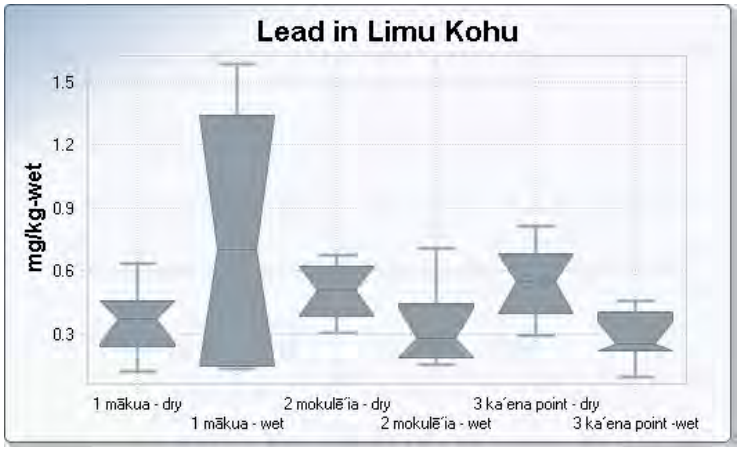

Cadmium in Limu Kohu
mg/kg-wet
0.120
0.100
0.080
0.060
0.040
0.020
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

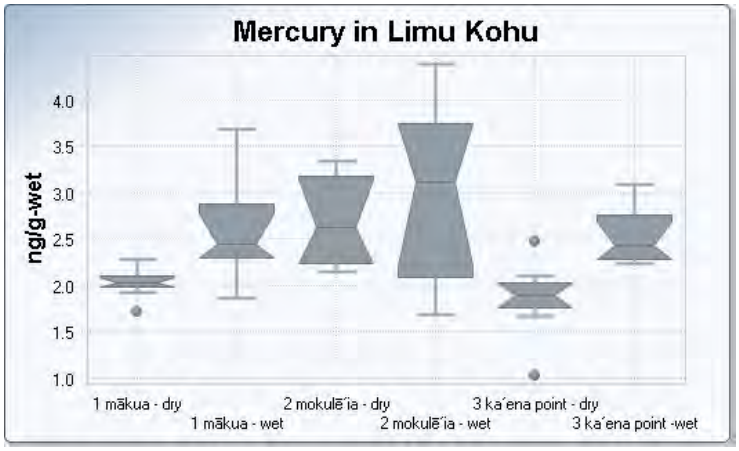

Chromium in Limu Kohu
mg/kg-wet
4.2
3.6
3.0
2.4
1.8
1.2
0.6
0.0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

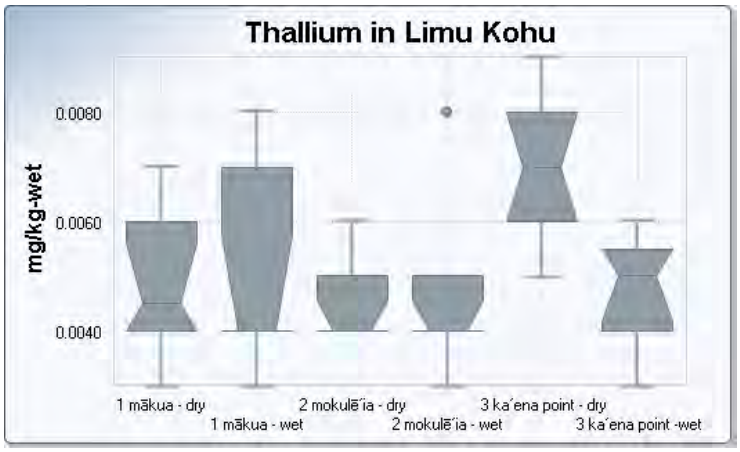
Cobalt in Limu Kohu
mg/kg-wet
0.60
0.50
0.40
0.30
0.20
0.10
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

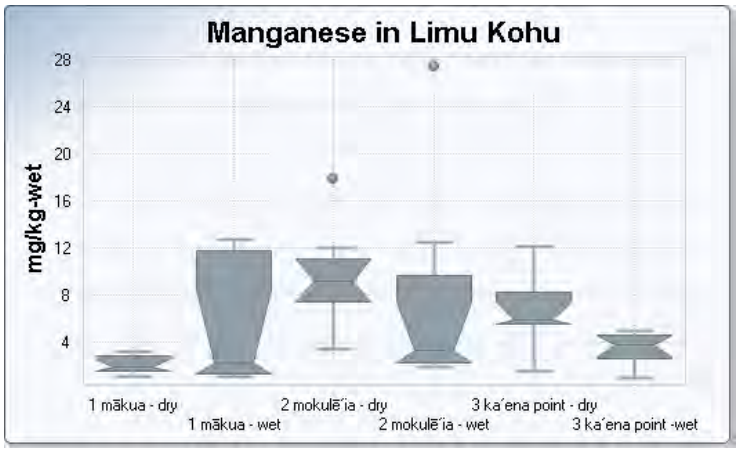

Copper in Limu Kohu
mg/kg-wet
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

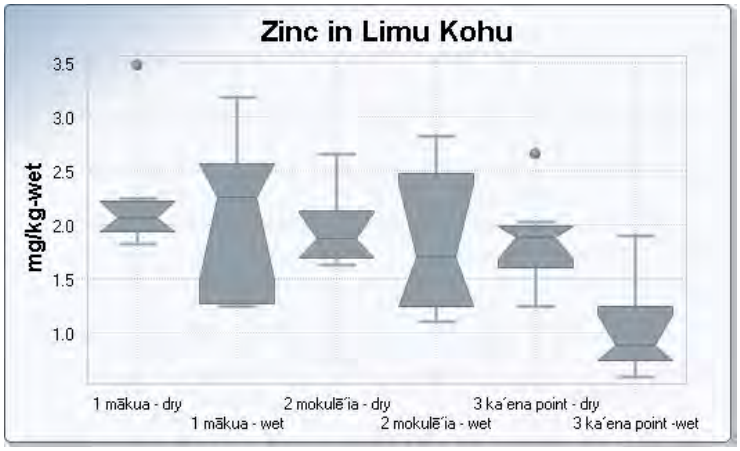

Iron in Limu Kohu
mg/kg-wet
1000
800
600
400
200
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet


Lead in Limu Kohu
mg/kg-wet
1.5
1.2
0.9
0.6
0.3
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet


Mercury in Limu Kohu
ng/g-wet
4.0
3.5
3.0
2.5
2.0
1.5
1.0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

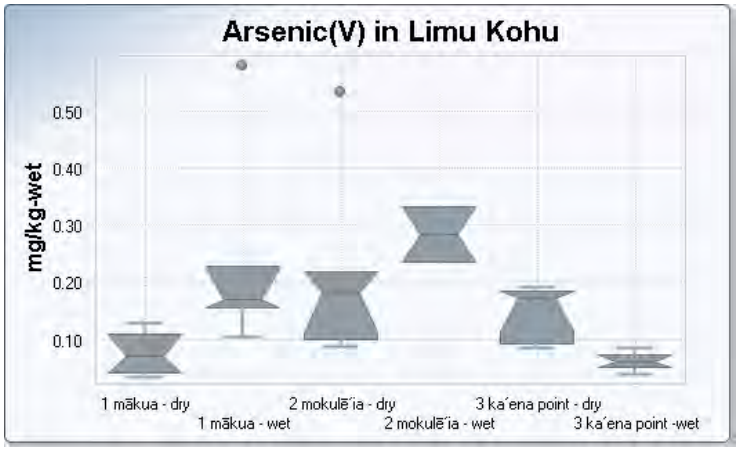

Thallium in Limu Kohu
mg/kg-wet
0.0080
0.0060
0.0040
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet


Manganese in Limu Kohu
mg/kg-wet
28
24
20
16
12
8
4
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet


Zinc in Limu Kohu
mg/kg-wet
3.5
3.0
2.5
2.0
1.5
1.0
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

Inorganic Arsenic in Limu Kohu
mg/kg-wet
1.5
1.2
0.9
0.6
0.3
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

Arsenic(III) in Limu Kohu
mg/kg-wet
1.4
1.2
1.0
0.8
0.6
0.4
0.2
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet


Arsenic(V) in Limu Kohu
mg/kg-wet
0.50
0.40
0.30
0.20
0.10
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

Dimethyl Arsenic in Limu Kohu
mg/kg-wet
0.350
0.300
0.250
0.200
0.150
0.100
1 mākua - dry
1 mākua - wet
2 mokulē´ia - dry
2 mokulē´ia - wet
3 ka´ena point - dry
3 ka´ena point -wet

Appendix H: Analytical Data QA/QC Summary

Analytical Data QA/QC Summary

Validation

Contract laboratories reviewed internally data they generated for accuracy, consistency, and quality assurance (QA)/quality control (QC) nonconformances and submitted appropriate documentation supporting these verification activities. The laboratories identified any outliers or errors and corrections.

In addition to the internal review of the laboratory's analytical data, an independent third-party data validation was performed to verify and ascertain the reliability of the analytical data for use in risk assessment calculations and other statistical analysis. The third-party data validation was performed under Environmental Protection Agency (EPA) Level III guidelines. EPA Level III validation was also used for the previous 2009 Marine Resources Study. The data validation was conducted based on the current versions of the EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008), for Inorganic Superfund Data Review (January 2010), and for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011); Department of Defense (DoD) Quality Assurance Manual (QSM) version 5.0 (March 2013); and Final Supplemental Marine Resources Study Sampling and Analysis Plan (August 2013). The guidelines were also modified to incorporate work practices and specifications of the actual methods employed. The modifications used were taken from SW-846, Test Methods for Evaluating Solid Wastes (February 2007).

The analytical data were validated at EPA Level III as mentioned above. Data qualifiers were applied to cases where the data do not meet the required QC criteria, or where special consideration of the data was required. The data validation reports are included in Appendix E. Throughout the data validation processes, the rejection qualifier "R" was applied to a single limu kohu sample (MAK120L) for organochlorine pesticides analysis due to low percent recovery for the surrogate spike (Table F-3 of the Mākua Marine Resources Supplemental Study Final Report and Appendix E LDC Project # 31852). Any other data that did not meet the QC requirements, but were judged to have issues with only minor impacts on data quality, were qualified as estimated value "J" (i.e. , results

that did not meet QC standards or results that were above the method detection limit but below the reporting limit), non-detects "U," or non-detects with estimated detection limits "UJ" according to the validation guidelines.

PARCC

Precision, accuracy, representativeness, comparability, and completeness (PARCC) parameters are used to evaluate the usability of all analytical data. PARCC parameters are evaluated as part of the data validation report. Summaries of the PARCC parameters are provided below.

Precision

Precision is a measure of agreement among repeated measurements of the same property under identical or substantially similar conditions. Precision was evaluated using the relative percent differences (RPDs) of the matrix spike (MS)/matrix spike duplicate (MSD) or laboratory duplicates. When precision criteria are not met, the bias is indeterminate. However, an RPD outside of established control limits may represent only a slight bias. The precision decreases as the RPD increases.

Overall, the precision for volatile organic compounds, semivolatile organic compounds, organochlorine pesticides, energetic compounds, dioxins/dibenzofurans, and metals is considered acceptable in all sample matrices, except for 4,4'-DNT, iron, mercury, copper, zinc, and lead in he'e samples; styrene, 4,4'-DDT, beta-BHC, heptachlor, gamma-BHC, 2,4-DNT, aluminum, manganese, chromium, iron, lead, and barium in limu kohu samples; and alpha-BHC, heptachlor, heptachlor epoxide, 4,4'-DDT, iron, aluminum, and mercury in loli samples. Elevated RPDs for MS/MSD analyses and duplicate pairs could indicate sample matrix non-homogeneity. There were no data rejected due to RPDs being outside of the control limits. A summary of the precision evaluation is provided in Table H-1 below and the complete data validation reports are provided in Appendix E.

Table H-1: Precision Evaluation (elevated RPDs and duplicate differences)

SDG	Spike ID or Duplicate ID	Associated Samples	Biota Type	Compound	MS/MSD RPD or Duplicate Difference	Limits	Qualifiers
Dry Season							
Volatile organic compounds							
006562/ 006563	MAK047LMS/MSD	MAK047L	Limu kohu	Styrene	61.3%	≤25%	J, detects UJ, non-detects
Organochlorine Pesticides							
006562/ 006563	MAK049LMS/MSD	MAK049L	Limu kohu	4,4'-DDT	39.3%	≤25%	J, detects
				beta-BHC	37.4%	≤25%	
				Heptachlor	32.1%	≤25%	J, detects UJ, non-detects
Metals							
1343025	MAK007OMS/MSD	MAK007O	He‘e	Iron	116%	≤30%	J, detects UJ, non-detects
	MAK030CDUP	MAK030C	Loli	Copper	98%	≤35%	J, detects UJ, non-detects
	MAK007ODUP	MAK007O	He‘e	Iron	1.673 mg/kg (difference limit)	≤1.604	J, detects UJ, non-detects
1345019	MAK007LDUP	MAK007L	Limu kohu	Aluminum	41%	≤35%	J, detects UJ, non-detects
				Manganese	38%	≤35%	
				Chromium	45%	≤35%	
				Iron	46%	≤35%	
				Lead	41%	≤35%	
Wet Season							
Volatile organic compounds							
006616/ 006617	MAK123LMS/MSD	MAK123L	Limu kohu	Styrene	45.6%	≤25%	J, detects UJ, non-detects
Organochlorine Pesticides							
006613	MAK101LMS/MSD	MAK101L	Limu kohu	Heptachlor	36.4%	≤25%	J, detects
				beta-BHC	53.2%	≤25%	
				gamma-BHC	28.4%	≤25%	J, detects UJ, non-detects
				4,4'-DDT	33%	≤25%	
006619	MAK111OMS/MSD	MAK111O	He‘e	4,4'-DDT	25.7%	≤25%	J, detects
006620	MAK130LMS/MSD	MAK130L	Limu kohu	gamma-BHC	42.8%	≤25%	J, detects
006621	MAK123CMS/MSD	MAK123C	Loli	alpha-BHC	27%	≤25%	J, detects
				Heptachlor	26.1%	≤25%	
				Heptachlor epoxide	25.6%	≤25%	
				4,4'-DDT	27.9%	≤25%	

Table H-1: Precision Evaluation (elevated RPDs and duplicate differences)

SDG	Spike ID or Duplicate ID	Associated Samples	Biota Type	Compound	MS/MSD RPD or Duplicate Difference	Limits	Qualifiers
Metals							
1408020	MAK105CDUP	MAK105C	Loli	Iron	46%	≤35%	J, detects UJ, non-detects
				Aluminum	42%	≤35%	
	MAK115LDUP	MAK101L, MAK102L, MAK105L, MAK106L, MAK108,109, 110,113L, MAK111L, MAK112L, MAK115L	Limu kohu	Iron	36%	≤35%	J, detects UJ, non-detects
1411043	MAK122LMS/MSD	MAK120L, MAK121L, MAK122L, MAK123L, MAK124L, MAK127L, MAK128L, MAK116L, MAK117L, MAK118L, MAK126L	Limu kohu	Barium	52%	≤35%	J, detects UJ, non-detects
	MAK111CDUP	MAK111C, MAK113C, MAK114C, MAK115C, MAK116C, MAK117C, MAK118C, MAK120C	Loli	Aluminum	2.09 mg/kg (difference limit)	≤1.60	J, detects UJ, non-detects
	MAK122LDUP	MAK120L, MAK121L, MAK122L, MAK123L, MAK124L, MAK127L, MAK128L, MAK116L, MAK117L, MAK118L, MAK126L	Limu kohu	Manganese	49%	≤35%	J, detects UJ, non-detects
				Iron	41%	≤35%	
1418004	MAK109OMS/MSD	MAK109O, MAK110O,	He'e	Mercury	57%	≤30%	J, detects UJ, non-detects

Table H-1: Precision Evaluation (elevated RPDs and duplicate differences)

SDG	Spike ID or Duplicate ID	Associated Samples	Biota Type	Compound	MS/MSD RPD or Duplicate Difference	Limits	Qualifiers
		MAK111O, MAK112O, MAK113O, MAK114O, MAK115O, MAK116O, MAK117O, MAK118O, MAK119O, MAK120O, MAK121O, MAK122O, MAK123O, MAK124O					
	MAK121CMS/MSD	MAK121C, MAK122C, MAK123C, MAK124C, MAK125C, MAK126C, MAK127C, MAK128C	Loli	Mercury	71%	≤30%	J, detects UJ, non-detects
	MAK109ODUP	MAK109O, MAK110O, MAK111O, MAK112O, MAK113O, MAK114O, MAK115O, MAK116O, MAK117O, MAK118O, MAK119O, MAK120O, MAK121O, MAK122O, MAK123O, MAK124O	He'e	Copper	80%	≤35%	J, detects UJ, non-detects
				Zinc	48%	≤35%	
				Lead	87%	≤35%	
	MAK121CDUP	MAK121C, MAK122C, MAK123C, MAK124C, MAK125C, MAK126C, MAK127C, MAK128C	Loli	Iron	6.51 mg/kg (difference limit)	≤1.52	J, detects UJ, non-detects
4033101	MAK123LMS/MSD	MAK123L	Limu kohu	2,4-Dinitrotoluene	47.7%	≤30%	J, detects

Accuracy

Accuracy is a measure of the overall agreement of a measurement to a known value. It represents the combination of random error (precision) and systematic error (bias). The evaluation of random error is described in the precision section above and the systematic error is evaluated from the recoveries of MS/MSD, laboratory control sample (LCS)/laboratory sample control duplicate (LCSD), and surrogate analytical species. Instrument calibrations were reviewed for accuracy assessment.

Overall, the accuracy for volatile organic compounds, semivolatile organic compounds, organochlorine pesticides, energetic compounds, dioxins/dibenzofurans, and metals is considered acceptable in all sample matrices, although there were recoveries outside of the control limits for di-n-butylphthalate, pentachlorophenol, 2,3,6,7,8-HxCDD, total HxCDD, perchlorate, arsenic, copper, iron, mercury, monomethyl arsenic, silver, and zinc in he‘e samples; styrene, o-Xylene, diethylphthalate, di-n-butylphthalate, pentachlorophenol, aldrin, alpha-BHC, beta-BHC, delta-BHC, gamma-BHC, heptachlor, heptachlor epoxide, 4,4'-DDT, aluminum, antimony, arsenic, arsenic (V), barium, beryllium, chromium, dimethyl arsenic, inorganic arsenic, iron, manganese, methyl mercury, vanadium, and 2,4-dinitrotoluene in limu kohu samples; and di-n-butylphthalate, 1,2,3,6,7,8-HxCDD, total HxCDD, OCDF, 4,4'-DDT, arsenic, arsenic (V), beryllium, copper, inorganic arsenic, mercury, methyl mercury, and silver in loli samples. Details are provided in Table H-2, Table H-3, and Appendix E.

The observation of high recoveries is suggestive of a high bias in the analyses and the associated sample results were qualified “J” (estimated value) for detects. The observation of low recoveries is suggestive of a possible low bias, and could indicate a possible matrix effect where the LCS recoveries were within the control limits. The associated samples were qualified by the third-party data validation as “J” (estimated value) for detects or “UJ” (estimated non-detected) or “R” (data is not usable) for non-detects (Table H-2, Table H-3, and Appendix E).

The third-party data validation indicated that although the recoveries of chromium and lead in the standard reference material (SRM) were outside of the limits of acceptance listed in the laboratory analytical reports, they did not qualify the results because the limits had been established by the

laboratory itself and were based upon/established from a separate lot. Therefore, it was evaluated by the third-party data validation that because the recoveries of the blank spike, other SRMs, and all matrix spikes met acceptable criteria no qualifications were necessary.

There was one low surrogate recovery in a single limu kohu sample (MAK120L) that resulted in the rejection of eight organochlorine pesticides results for the single limu kohu sample. These were the only data points qualified as rejected due to QC results for accuracy/bias evaluations. The overall project accuracy is considered acceptable for all analyte groups in all sample matrices, with 99.9% of sample results acceptable (not qualified as rejected [R] by third-party data validation).

A summary of the accuracy/bias evaluation is provided in Table H-2 and Table H-3 below and the complete validation reports are provided in Appendix E.

Table H-2: Accuracy/Bias Evaluation (%R outside of the control limits)

SDG	Spike ID	Associated Samples	Biota Type	Compounds	%R	Limits	Qualifiers
Dry Season							
Volatile organic compounds							
006562/ 006563	MAK047LMS/MSD	MAK047L	Limu kohu	Styrene	MS – 55% MSD – 29.2%	79-127%	J, detects UJ, non-detects
	MAK049LMS/MSD	MAK049L	Limu kohu	Styrene	MS – 44.4 MSD – 38.3	79-127%	J, detects UJ, non-detects
Semivolatile organic compounds							
006562/ 006563	MAK049LMS/MSD	MAK049L	Limu kohu	Di-n-butylphthalate	MSD – 50.8%	54-118%	J, detects UJ, non-detects
4091104	Surrogate Spike (Terphenyl-d14)	MAK013O	He‘e	Pentachlorophenol	137%	40-130%	J, detects
		MAK018O	He‘e		132%	40-130%	
		MAK019O	He‘e		139%	40-130%	
		MAK030L	Limu kohu		131%	40-130%	
		MAK033L	Limu kohu		134%	40-130%	
		MAK038L	Limu kohu		136%	40-130%	
	Laboratory Control Sample (B409182-BS1)	MAK024L/25L, MAK025L, MAK029L,	Limu kohu	Pentachlorophenol	314%	50-130%	J, detects

Table H-2: Accuracy/Bias Evaluation (%R outside of the control limits)

SDG	Spike ID	Associated Samples	Biota Type	Compounds	%R	Limits	Qualifiers
		MAK030L, MAK033L, MAK034L, MAK038L, MAK041L, MAK042L, MAK043L, MAK044L, MAK045L, MAK046L					
Organochlorine Pesticides							
006562/ 006563	MAK047LMS/MSD	MAK047L	Limu kohu	delta-BHC	MS – 140.6% MSD – 129.9%	48-118%	J, detects
	MAK049LMS/MSD	MAK049L	Limu kohu	delta-BHC	MS – 172.7% MSD – 142.4%	48-118%	J, detects
				beta-BHC	MS – 142.3%	50-111%	
				Heptachlor	MSD – 50.9%	52-114%	J, detects UJ, non-detects
Dioxins/Dibenzofurans							
10247058	MAK001CMS/MSD	MAK001C	Loli	1,2,3,6,7,8-HxCDD (associated compound Total HxCDD)	132%	70-130%	J, detects
				OCDF	131%	70-130%	
Metals							
1343025	MAK030CMS/MSD	MAK030C	Loli	Copper	MS - 61% MSD – 61%	70-130%	J, detects UJ, non-detects
	MAK006OMS/MSD	MAK006O	He‘e	Copper	MS – 65% MSD – 44%	70-130%	J, detects UJ, non-detects
				Monomethyl arsenic	MS – 53% MSD – 56%	60-140%	
	MAK007OMS/MSD	MAK007O	He‘e	Copper	MS – 23% MSD – 25%	70-130%	J, detects R, non-detects
				Iron	MS – 362%	70-130%	J, detects UJ, non-detects
	MAK008OMS/MSD	MAK008O	He‘e	Monomethyl arsenic	MS – 58% MSD – 58%	60-140%	J, detects UJ, non-detects
1345019	MAK001 L/2L/26LMS/MSD	All samples in SDG 1345019	Limu kohu	Dimethyl arsenic	MS – 21% MSD – 24%	60-140%	J, detects R, non-detects

Table H-2: Accuracy/Bias Evaluation (%R outside of the control limits)

SDG	Spike ID	Associated Samples	Biota Type	Compounds	%R	Limits	Qualifiers
	MAK025LMS/MSD	All samples in SDG 1345019	Limu kohu	Dimethyl arsenic	MS – 15% MSD – 38%	60-140%	J, detects R, non-detects
		MAK025L		Methyl mercury	MSD – 138%	65-135%	J, detects
	MAK045LMS/MSD	All samples in SDG 1345019	Limu kohu	Dimethyl arsenic	MS – 41% MSD - 28%	60-140%	J, detects R, non-detects
	MAK007LMS/MSD	MAK007L	Limu kohu	Antimony	MS – 53% MSD – 52%	70-130%	J, detects UJ, non-detects
				Chromium	MS – 45%	70-130%	
				Vanadium	MS – 65%	70-130%	
	MAK029LMS/MSD	MAK029L	Limu kohu	Aluminum	MS – 136%	70-130%	J, detects
				Manganese	MS - 168% MSD – 144%	70-130%	
				Iron	MS – 205% MSD – 177%	70-130%	
	MAK046LMS/MSD	MAK046L	Limu kohu	Antimony	MS – 66% MSD – 68%	70-130%	J, detects UJ, non-detects
	MAK001L/2L/26LMS	MAK001/2L/26L	Limu kohu	Inorganic arsenic (associated compound Arsenic (V))	MS – 142%	65-135%	J, detects
3121902	Surrogate Spike (1,2-Dinitrobenzene)	All samples in SDG 3121902	Limu kohu	2,4-Dinitrotoluene	High surrogate recoveries (various)	60-120%	J, detects
Wet Season							
Volatile organic compounds							
006616/ 006617	MAK123LMS/MSD	MAK123L	Limu kohu	Styrene	MS – 52.6% MSD – 33.1%	79-127%	J, detects UJ, non-detects
006613	MAK101LMS/MSD	MAK101L	Limu kohu	Styrene	MS – 20.1% MSD – 18.2%	79-127%	J, detects UJ, non-detects
				o-Xylene	MS – 64.5% MSD - 60.8%	81-128%	
Semivolatile organic compounds							
006616/ 006617	MAK123LMS/MSD	MAK123L	Limu kohu	Diethylphthalate	MS – 36.5% MSD – 28.4%	57-112%	J, detects UJ, non-detects
				Di-n-butylphthalate	MSD – 48.9%	54-118%	
4091104	MAK114OMS/MSD	MAK114O	He‘e	Pentachlorophenol	Ms – 46.9%	50-130%	J, detects UJ, non-detects
	Laboratory Control Sample (B409182-BS1)	MAK109O, MAK110O, MAK111O, MAK112O, MAK113O,	He‘e	Pentachlorophenol	314%	50-130%	J, detects

Table H-2: Accuracy/Bias Evaluation (%R outside of the control limits)

SDG	Spike ID	Associated Samples	Biota Type	Compounds	%R	Limits	Qualifiers
		MAK114O, MAK115O					
4091105	Surrogate Spike (Terphenyl-d14)	MAK102O	He'e	Pentachlorophenol	131%	40-130%	J, detects
	Surrogate Spike (2-Fluorobiphenyl)	MAK101L	Limu kohu	Pentachlorophenol	196%	40-130%	J, detects
		MAK102L			172%		
		MAK106L			135%		
		MAK108,109,110,113L			213%		
		MAK111L			199%		
		MAK112L			266%		
		MAK115L			153%		
	MAK105OMS/MSD	MAK105O	He'e	Pentachlorophenol	MS – 133%	50-130%	J, detects
Organochlorine Pesticides							
006611	Surrogate Spike (Decachlorobiphenyl)	MAK103O	He'e	All TCL compounds	131%	25-125%	J, detects
006613	Surrogate Spike (Tetrachloro-m-xylene)	MAK105L	Limu kohu	All TCL compounds	21%	25-125%	J, detects UJ, non-detects
	Surrogate Spike (Tetrachloro-m-xylene)	MAK106L	Limu kohu	All TCL compounds	15%	25-125%	J, detects UJ, non-detects
	Surrogate Spike (Tetrachloro-m-xylene)	MAK108, 109,110, 113L	Limu kohu	All TCL compounds	23%	25-125%	J, detects UJ, non-detects
	MAK101LMS/MSD	MAK101L	Limu kohu	alpha-BHC	MS - 177% MSD – 218.8%	45-113%	J, detects
				Heptachlor	MS – 293.9% MSD – 203.8%	52-114%	
				beta-BHC	MS – 129.6%	50-111%	
				gamma-BHC	MSD – 43.9%	51-112%	J, detects UJ, non-detects
				delta-BHC	MD – 45.3% MSD – 40.3%	48-118%	
				Aldrin	MS – 28.8% MSD – 29.8%	51-111%	
				4,4'-DDT	MS – 50.7% MSD – 36.4%	55-122%	
006616/ 006617	Surrogate spike (Tetrachloro-m-xylene)	MAK120L	Limu kohu	All TCL compounds	8%	25-125%	J, detects R, non-detects
	Surrogate spike (Tetrachloro-m-xylene)	MAK121L	Limu kohu	All TCL compounds	22%	25-125%	J, detects UJ, non-detects

Table H-2: Accuracy/Bias Evaluation (%R outside of the control limits)

SDG	Spike ID	Associated Samples	Biota Type	Compounds	%R	Limits	Qualifiers
	Surrogate spike (Tetrachloro-m-xylene)	MAK124L	Limu kohu	All TCL compounds	19%	25-125%	J, detects UJ, non-detects
	MAK123LMS/MSD	MAK123L	Limu kohu	alpha-BHC	MS - 124.8%	45-113%	J, detects
				Heptachlor	MS – 128%	52-114%	
				Heptachlor epoxide	MS – 123.7%	53-110%	
				beta-BHC	MSD – 121.9%	50-111%	
006620	Surrogate spike (Tetrachloro-m-xylene)	MAK130L	Limu kohu	All TCL compounds	277%	25-125%	J, detects
	MAK130LMS/MSD	MAK130L	Limu kohu	gamma-BHC	MS – 303.2% MSD – 196%	51-112%	J, detects
				Heptachlor	MSD – 120%	52-114%	
				beta-BHC	MS – 138.9% MSD – 122.8%	50-111%	
Dioxins/Dibenzofurans							
10265141	MAK120OMS/MSD	MAK120O	He'e	1,2,3,6,7,8-HxCDD (associated compound Total HxCDD)	MSD – 134%	70-130%	J, detects
Metals							
1408020	MAK115LMS/MSD	MAK101L, MAK102L, MAK105L, MAK106L, MAK108,109,110,113L, MAK111L, MAK112L, MAK115L	Limu kohu	Manganese	MS – 62%	70-130%	J, detects UJ, non-detects
				Aluminum	MS – 47%	70-130%	
	MAK103CMS/MSD	MAK102C, MAK103C, MAK104C, MAK105C, MAK106C, MAK107C, MAK108C, MAK110C	Loli	Methyl Mercury	MS – 139% MSD – 137%	65-135%	J, detects
	MAK103CMS/MSD	MAK102C, MAK103C, MAK104C , MAK105C, MAK106C,	Loli	Arsenic (Inorg) (associated compound Arsenic (V))	MSD – 45%	65-135%	J, detects UJ, non-detects

Table H-2: Accuracy/Bias Evaluation (%R outside of the control limits)

SDG	Spike ID	Associated Samples	Biota Type	Compounds	%R	Limits	Qualifiers
		MAK107C, MAK108C, MAK110C					
	MAK106LMS/MSD	MAK101L, MAK102L, MAK105L, MAK106L, MAK108,109, 10,113L, MAK111L, MAK112L, MAK115L,	Limu kohu	Methyl Mercury	MSD – 143%	65-135%	J, detects
	MAK101OMS/MSD	MAK101O, MAK102O, MAK103O, MAK104O, MAK105O, MAK106O, MAK107O, MAK108O	He‘e	Monomethyl Arsenic	MS – 52%	60-140%	J, detects UJ, non-detects
1408020	LCS	All samples in SDG 1408020	He‘e, Limu kohu, Loli	Arsenic	117%	85-115%	J, detects
1411043	MAK120LMS/MSD	MAK120L, MAK121L, MAK122L, MAK123L, MAK124L, MAK127L, MAK128L, MAK116L, MAK117L, MAK118L, MAK126L	Limu Kohu	Arsenic (Inorg) (associated compound Arsenic (V))	MS – 44%	65-135%	J, detects UJ, non-detects
1418004	MAK109OMS/MSD	MAK109O, MAK110O, MAK111O, MAK112O, MAK113O, MAK114O, MAK115O, MAK116O, MAK117O, MAK118O, MAK119O, MAK120O, MAK121O, MAK122O, MAK123O, MAK124O	He‘e	Zinc	MS - -34% MSD - -20%	70-130%	J, detect R, non-detects

Table H-2: Accuracy/Bias Evaluation (%R outside of the control limits)

SDG	Spike ID	Associated Samples	Biota Type	Compounds	%R	Limits	Qualifiers
1418004 4033101	MAK109OMS/MSD	MAK109O, MAK110O, MAK111O, MAK112O, MAK113O, MAK114O, MAK115O, MAK116O, MAK117O, MAK118O, MAK119O, MAK120O, MAK121O, MAK122O, MAK123O, MAK124O	He'e	Mercury	MSD – 49%	70-130%	J, detects UJ, non-detects
	MAK130LMS/MSD	MAK130L, MAK132L, MAK134L, MAK135L, MAK138L	Limu kohu	Barium	MSD - 173%	70-130%	J, detects
	MAK121CMS/MSD	MAK121C, MAK122C, MAK123C, MAK124C, MAK125C, MAK126C, MAK127C, MAK128C	Loli	Mercury	MSD – 228%	70-130%	J, detects UJ, non-detects
	Surrogate Spike (1,2-Dinitrobenzene)	All samples in 4033101	Limu kohu	2,4-Dinitrotoluene	High surrogate recoveries (various)	60-120%	J, detects
4052803	Surrogate Spike (1,2-Dinitrobenzene)	All samples in 4052803	Limu kohu	2,4-Dinitrotoluene	High surrogate recoveries (various)	60-120%	J, detects

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Table H-3: Accuracy/Bias Evaluation (instrument calibrations outside of the control limits)

SDG	Lab Reference ID	Associated Samples	Biota Type	Compounds	%D or %R or %RSD	Limits	Qualifiers
Dry Season							
Perchlorate							
320-4662-1	Continuing Calibration	MAK001O, MAK003O, MAK004O, MAK005O, MAK006O, MAK007O,	He'e	Perchlorate	15.6%D	≤15.0%D	J, detects UJ, non-detects

Table H-3: Accuracy/Bias Evaluation (instrument calibrations outside of the control limits)

SDG	Lab Reference ID	Associated Samples	Biota Type	Compounds	%D or %R or %RSD	Limits	Qualifiers
		MAK009O, MAK010O, MAK011O, MAK012O, MAK013O, MAK014O, MAK015O, MAK016O, MAK017O, MAK018O, MAK019O, MAK020O MAK021O, MAK022O, MAK023O, MAK024O					
Semivolatile organic compounds							
4091104	Continuing Calibration	MAK047L MS, MAK047MSD	Limu kohu	Pentachlorophenol	50.7%D	≤20.0%D	J, detects UJ, non-detects
Metals							
1343025	Calibration standards (1300820-SCV1)	All samples in SDG 1343025	He‘e and Loli	Silver	89%R	90-110%R	J, detects UJ, non-detects
	Calibration standard (1300831-CCV5)	MAK010O	He‘e	Arsenic	111%R	90-110%R	J, detects
1345019	Calibration standards (1300820-SCV1)	All samples in SDG 1345019	Limu kohu	Silver	89%R	90-110%R	J, detects UJ, non-detects
Wet Season							
Semivolatile organic compounds							
006611	Initial calibration	All samples in SDG 006611	He‘e	Di-n-butylphthalate	15.44%RSD	15.0%RSD	J, detects UJ, non-detects
006612	Initial calibration	All samples in SDG 006612	Loli	Di-n-butylphthalate	15.44%RSD	15.0%RSD	J, detects UJ, non-detects
006613	Initial calibration	All samples in SDG 006613	Limu kohu	Di-n-butylphthalate	15.44%RSD	15.0%RSD	J, detects UJ, non-detects
006615	Initial calibration	All samples in SDG 006615	Loli	Di-n-butylphthalate	15.44%RSD	15.0%RSD	J, detects UJ, non-detects
006616/ 006617	Initial calibration	All samples in SDG 006616/006617	Limu kohu	Di-n-butylphthalate	15.44%RSD	15.0%RSD	J, detects UJ, non-detects

Table H-3: Accuracy/Bias Evaluation (instrument calibrations outside of the control limits)

SDG	Lab Reference ID	Associated Samples	Biota Type	Compounds	%D or %R or %RSD	Limits	Qualifiers
Organochlorine Pesticides							
006612	Initial calibration	All samples in SDG 006612	Loli	4,4'-DDT	20.593%RSD	20.0%RSD	J, detects UJ, non-detects
006613	Initial calibration	All samples in SDG 006613	Limu kohu	4,4'-DDT	20.593%RSD	20.0%RSD	J, detects UJ, non-detects
Metals							
1411043	Calibration standard (CCVG)	MAK111C, MAK113C, MAK114C, MAK115C, MAK116C, MAK117C, MAK118C	Loli	Silver	138%R	90-110%R	J, detects
	Calibration standard (CCVH)	MAK111C, MAK113C, MAK114C, MAK115C, MAK116C, MAK117C, MAK118C, MAK120C, MAK120L, MAK121L, MAK122L, MAK116L, MAK117L	Loli & Limu kohu	Beryllium	115%R	90-110%R	J, detects

Representativeness

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population. Representativeness can be obtained through evaluation of holding times, trip blanks, and method blanks.

Samples were stored under -4 degrees Fahrenheit (-20 degrees Celsius). The holding time requirements for the samples were met, except for pentachlorophenol analysis of three he'e samples (MAK001O, MAK002O, and MAK003O), four loli samples (MAK001C, MAK002C, MAK004C, and MAK005C), and one limu kohu sample (MAK001L/2L/26L). These samples were extracted three days outside of the holding time and the samples were qualified by the third-party data validation as "J" (estimated value) for detects or "UJ" (estimated non-detected). Sample data are representative of the site conditions at the time of sample collection.

Trip blanks accompanied the samples during shipments and they froze and the vials shattered. This was an unavoidable side-effect of shipping the

samples at below zero temperatures. There is no impact to our ability to assess data representativeness because in all samples there were no detections of volatile organic compounds at or above the method detection limits. Third-party data validators reviewed the analytical data and evaluated that no uncertainty was present (no results were qualified) based on the absence of trip blank analysis.

The 5X (five times) rule was applied (i.e. , For positive blank values, if the sample results were less than 5X of the method results, the data were qualified as non-detects [U]. For the negative blanks, if the sample results were less than 5X of the absolute value of the blank, the data were considered estimates). Summaries of the method blank qualifications are provided the subsections below. The complete data validation reports are provided in Appendix E.

Overall, the results of all analytes are considered representative for all sample matrices.

Dioxin/Dibenzofurans

In dioxin/dibenzofurans analysis of loli, he‘e, and limu kohu samples during the dry season (Sample Delivery Groups [SDGs] 10247058, 10247065, 10247062, 10247063, 10248731,) and during the wet season (SDGs 10258392, 10260486, 10265141), 2,3,7,8-TCDF, Total TCDF, Total TCDD, Total HpCDD, 1,2,3,4,6,7,8-HpCDD, OCDF, OCDD, Total HxCDD, 1,2,3,7,8,9-HxCDD, Total PeCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, Total HpCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, and Total PeCDF were found at detectable concentrations in the method blanks. When concentrations of these constituents in samples were compared to the concentrations detected in the method blanks, analytes in the samples were either below the detection limits or were significantly greater (greater than 5X blank contaminants) than the concentrations found in the associated method blanks. Results were evaluated by the third-party data validation not to be detected at or above the method detection limit and were therefore qualified as such (U-qualified) (Appendix E).

Metals

The analyses of metals in the he‘e, limu kohu, and loli samples during the dry season (SDG 1343025 and SDG 1345019) and during the wet season (SDG 1408020, SDG 1411043, and SDG 1418004) yielded detections of aluminum, arsenic, barium, chromium, copper, iron, lead, manganese, mercury, selenium, thallium, and zinc in the initial, continuing, and preparation blanks. When concentrations of analytes in samples were compared to those in the method blanks, the analytes were either not detected in the samples or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks. Results were evaluated by the third-party data validation not to be detected at or above the method detection limit and were therefore qualified as such (U-qualified) (Appendix E).

Comparability

Comparability expresses the measure of confidence that one data set can be compared to another and can be combined for the purpose of decision making. Comparability can be assessed through evaluation of sample collection and handling methods, and sample preparation and analytical procedures.

In this study, samples were collected from the nearshore waters of three locations (Mākua, Mokulē‘ia, and Ka‘ena Point) during two seasons – the dry season (September and October 2013) and the wet season (January through March 2014). During the two sampling seasons, the sampling methods, sample storage, and biota sample pretreatments were all comparable. The two sample sets were sent to the same laboratories for analysis. The laboratory sample preparation and analysis procedures were all the same for the two sets of samples. Therefore, the data obtained from the two seasons from the three locations are considered comparable and can be combined for decision making.

Completeness

Completeness is the degree to which the data set provides, under the actual condition of sampling and analysis, a sufficient number of data points to perform the specified data analyses relative to the assumptions of the project planning process. Completeness is evaluated by comparing the

number of valid data with those required by the study's quality criteria or total number of data obtained during this study.

Among the 10,680 results obtained and validated for this study, eight results were rejected by the third-party data validation. The rejected data consisted of organochlorine pesticide results for a single limu kohu sample (MAK120L) due to low percent recovery for the surrogate spike. The overall project completeness is 99.9%, which meets the completeness requirement for this study (greater than 90%). The information about the numbers of total data records, rejected data, and completeness for each analyte group is provided below in Table H-4.

Table H-4: Completeness of Data

Parameter / Analytical Method	Total Number of Records	Number of Rejected Records[1]	Percent Completeness
Volatile organic compounds / EPA 8260B	864	0	100%
Semivolatile organic compounds / EPA 8270C	1,008	0	100%
Organochlorine Pesticides / EPA 8081B	1,152	8	99.3%
Energetic Compounds / EPA 6850, EPA 8330A, EPA 8270C, EPA 8330	600	0	100%
Dioxins/Dibenzofurans / EPA 1613B	3,600	0	100%
Metals / EPA 200.8, EPA 200.8 DRC, EPA 1631, EPA 1630	2,736	0	100%
Arsenic Speciation / EPA 1632	720	0	100%
Total	**10,680**	**8**	**99.9%**

Notes:
The counts presented on this table include all biota samples that were analyzed by the laboratories. Refer to the Mākua Marine Resources Supplemental Study Final Report, Table F-1 through Table F-7 for a summary of the results.

[1] Rejected records include results evaluated by the third-party data validation as not usable (R-qualified).

Appendix I: Human Health Risk Assessment

(Included as a separate file)