## FINAL

MPRSA Section 103 Sediment Characterization
Testing and Analysis
Puerto Rico Ports Authority Berthing Areas
Piers 1-4 and Piers 11-14
Puerto Nuevo Harbor Piers A-D and Piers E-O
San Juan Harbor, Puerto Rico

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#### MPRSA Section 103 Sediment Characterization Puerto Rico Ports Authority Berthing Areas



		3.5.2	Americamysis bahia	32
	3.6	Water	Column Bioassays	32
		3.6.1	Americamysis bahia	
			Menidia beryllina	
		3.6.3	Mytilus galloprovincialis	34
	3.7	Bioaco	cumulation Potential Tests	35
	3.8	Toxico	ology Summary	36
	3,9		Chemistry	
		3.9.1	Lipids and Total Solids in Tissue	36
		3.9.2	Metals in Tissue	
		3.9.3	Pesticides in Tissue	38
			PAHs in Tissue	
		3.9.5	PCBs in Tissue	39
4	QUA	LITY A	SSURANCE/QUALITY CONTROL	42
	4.1	Coord	ination with EPA	42
	4.2		e Receipt	
		4.2.1		
		4.2.2		
		4.2.3	ALS and Terracon	42
	4.3	Physic	al Analysis	42
	4.4	Sedim	ent Chemistry	43
		4.4.1	Trace Metals	
			Pesticides and PCB Congeners	
		4.4.3	Polycyclic Aromatic Hydrocarbons	43
	4.5	Site W	/ater and Elutriate Chemistry	44
		4.5.1	Trace Metals	
		4.5.2	Pesticides and PCB Congeners	44
	4.6	Tissue	Chemistry	44
		4.6.1	Trace Metals	
			Pesticides and PCB Congeners	
			PAHs	
	4.7		logy	
		4.7.1	Benthic Toxicology Testing	
			Water Column Toxicology Testing	
			Bioaccumulation Tests	
5	ADD	AMS M	IODEL	49
RE	FERE	ENCES		55



#### MAPS

Map 1 Puerto Rico Ports Authority Piers 1-4 and Piers 11-14, Reference, and Site Water

Map 2 Puerto Rico Ports Authority Piers A through D and Piers E through O

## LIST OF TABLES

Table 1	Vibracore and Grab Sample Summary
Table 2	Reference and Site Water Sample Summary Including Water Column Measurements
Table 3	Results of Physical Analyses for Sediment Subsamples
Table 4	Results of Physical Analyses for Composited Sediment Samples
Table 5	Analytical Results for Total Solids and TOCs in Sediment Samples
Table 6	Analytical Results for Dry Weight Metals in Sediment Samples
Table 7	Analytical Results for Dry Weight Pesticides in Sediment Samples
Table 8	Analytical Results for Dry Weight PAHs in Sediment Samples
Table 9	Analytical Results for Dry Weight PCBs in Sediment Samples
Table 10	Analytical Results for Metals in Site Water and Elutriates Generated from Sediment
Table 11	Analytical Results for Pesticides in Site Water and Elutriates Generated from Sedimen
Table 12	Analytical Results for PCBs in Site Water and Elutriates Generated from Sediment Samples
Table 13	Analytical Results for Wet Weight Lipids and Total Solids in Macoma nasuta Tissues
Table 14	Analytical Results for Wet Weight Lipids and Total Solids in Alitta virens Tissues
Table 15	Analytical Results for Wet Weight Metals in Macoma nasuta Tissues
Table 16	Analytical Results for Wet Weight Metals in Alitta virens Tissues
Table 17	Analytical Results for Dry Weight Metals in Macoma nasuta Tissues
Table 18	Analytical Results for Dry Weight Metals in Alitta virens Tissues
Table 19	Analytical Results for Wet Weight Pesticides in Macoma nasuta Tissues
Table 20	Analytical Results for Wet Weight Pesticides in Alitta virens Tissues
Table 21	Analytical Results for Dry Weight Pesticides in Macoma nasuta Tissues
Table 22	Analytical Results for Dry Weight Pesticides in Alitta virens Tissues
Table 23	Analytical Results for Wet Weight PAHs in Macoma nasuta Tissues
Table 24	Analytical Results for Wet Weight PAHs in Alitta virens Tissues
Table 25	Analytical Results for Dry Weight PAHs in Macoma nasuta Tissues
Table 26	Analytical Results for Dry Weight PAHs in Alitta virens Tissues
Table 27	Analytical Results for Wet Weight PCBs in Macoma nasuta Tissues
Table 28	Analytical Results for Wet Weight PCBs in Alitta virens Tissues
Table 29	Analytical Results for Dry Weight PCBs in Macoma nasuta Tissues
Table 30	Analytical Results for Dry Weight PCBs in Alitta virens Tissues



#### ACRONYMS, ABBREVIATIONS, AND INITIALISMS

ADDAMS Automated Dredging and Disposal Alternatives Modeling System

ARI Analytical Resources, Inc.
CCV continuing calibration verification

CETIS Comprehensive Environmental Toxicity Information System

CFR Code of Federal Regulations

CMC criteria maximum concentration (synonymous with 'acute')

CQAR Chemical Quality Assurance Report

DQCR Daily Quality Control Report

EC50 effective concentration affecting 50% of a population

EPA U.S. Environmental Protection Agency

ERDC (USACE) Engineer Research and Development Center

ERL effects range-low

FDA U.S. Food and Drug Administration
GC/MS gas chromatography/mass spectrometry

GC-ECD gas-chromatography-electron capture detection (GC-ECD)

HMW high molecular weight

ICP/MS inductively coupled plasma/mass spectrometry

ICV initial calibration verification

ITM Inland Testing Manual (EPA and USACE 1998)

LC50 lethal concentration 50% LCS laboratory control sample LMW low molecular weight

LPC limiting permissible concentration

MDL method detection limit mg/L milligrams per liter MLLW mean lower low water

MPRSA Marine Protection, Research, and Sanctuaries Act

MRL method reporting limit

MTC Materials Testing & Consulting, Inc.

NOAA National Oceanic and Atmospheric Administration

NOEC no-observed-effect concentration NTU nephelometric turbidity unit

ODMDS ocean dredged material disposal site PAH polycyclic aromatic hydrocarbon

PCB polychlorinated biphenyl ppt parts per thousand PRPA Puerto Rico Ports Authority

PWS project work scope
QA quality assurance
QC quality control

RPD relative percent difference RPD relative percent difference

RTM (NY Army Corps of Engineers District) Regional Testing Manual SAP/QAPP Sampling and Analysis Plan/Quality Assurance Project Plan

SDS sodium dodecyl sulfate
SOP standard operating procedure
SRM standard reference material
TEL threshold effects level
TOC total organic carbon
UIA un-ionized ammonia

USACE U.S. Army Corps of Engineers USCS U.S. Soil Classification System



#### Piers 1 through 4

PIERS20-3-COMP was composed primarily of silt and clay (86.5%), with 12.4% sand and 1.1% gravel.

### Piers 11 through 14

NEWWO20-5-COMP was composed primarily of silt and clay (58.2%), with 40.4% sand and 1.4% gravel.

#### Reference

SJH20-REF was composed primarily of silt and clay (90.1%), with 9.1% sand.

## Sediment Chemistry

Sediment composites, subsamples from three of the four project reaches, and the reference were analyzed for TOC, total solids, metals, pesticides, PAHs, and PCBs. With the exception of total solids and TOC, subsamples from the NEWWO20 project reach were not analyzed individually for sediment chemistry because the composite sample from this reach underwent the full suite of toxicological and bioaccumulation testing. Comparison of sediment chemistry results were made to the TEL and ERL, where available.

#### **Metals**

All nine metals analyzed were detected in concentrations above the MDL in the project composites and subsamples. With the exception of cadmium, all other metals analyzed were also detected in concentrations above the MDL in the reference sample. Concentrations of metals were below applicable TEL and ERL thresholds with the exceptions summarized below.

## Puerto Nuevo Harbor Piers A through D

- PRC20-1-COMP: arsenic, copper, lead, mercury, nickel, silver, and zinc exceeded the TEL and (or) ERL.
- PRC20-1-A: arsenic, copper, lead, mercury, nickel, silver, and zinc exceeded the TEL and (or) ERL.
- PRC20-1-B: arsenic, chromium, copper, lead, mercury, nickel, silver, and zinc exceeded the TEL and (or) ERL.
- PRC20-1-C: arsenic, copper, mercury, nickel, silver, and zinc exceeded the TEL and (or) ERL.

## Puerto Nuevo Harbor Piers E through O

- PRC20-2-COMP: arsenic, copper, mercury, and nickel exceeded the TEL and (or) ERL.
- PRC20-2-A: arsenic, chromium, copper, mercury, and nickel exceeded the TEL and (or) ERL.
- PRC20-2-B: arsenic, copper, mercury, nickel, and zinc exceeded the TEL and (or) ERL.
- PRC20-2-C: arsenic, copper, mercury, nickel, silver, and zinc exceeded the TEL and (or) ERL.



#### Piers 1 through 4

- PIERS20-3-COMP: seven PAHs and total HMW PAHs exceeded the TEL and one PAH analyte also exceeded the ERL.
- PIERS20-3-A: nine PAHs, total HMW PAHs, and total PAHs exceeded the TEL and one PAH analyte also exceeded the ERL.
- PIERS20-3-B and PRC20-1-C: acenaphthylene and dibenzo(a,h)anthracene exceeded the TEL.

### Piers 11 through 14

• NEWWO20-5-COMP: acenaphthylene and dibenzo(a,h)anthracene exceeded the TEL.

#### **PCBs**

Up to 17 of the 22 PCB congeners tested were detected in concentrations above the MDL/MRL in one or more composites. All composites, subsamples, and the reference had total EPA Region 2 PCB concentrations that exceeded the applicable TEL and/or ERL.

## Elutriate and Water Chemistry

Metals, pesticides, and PCBs were analyzed in the site water (PRPA-SW), reference site water (SJH20-REF-SW) and elutriates generated from the project composite (NEWWO20-5-COMP). Comparison of elutriate and site water chemistry results were made to the CMC, where available.

#### **Metals**

None of the metals analyzed were detected in concentrations greater than the CMC in any elutriate or water samples.

#### Pesticides

None of the pesticides analyzed were detected in concentrations greater than the CMC in any elutriate or site water samples (U-qualified).

#### **PCBs**

None of the PCB congeners were detected in concentrations above the MDL in any elutriate or site water samples (U-qualified). There are no CMCs for the PCB congeners tested.

#### Toxicology

#### Benthic Bioassays

No significant benthic toxicity, relative to the reference treatment, was observed in the *A. abdita* amphipod test or the *A. bahia* mysid test. Mean percent survival in the project composite samples was within the specific test criterion (20% of the reference: amphipod; 10% of the reference: mysid), indicating that the test treatments met the LPC for disposal for these tests.

### Water Column Bioassay

No statistically significant toxicity was observed in the 100% elutriate concentrations for the *A. bahia, M. beryllina,* and *M. galloprovincialis* tests.



sample were statistically significantly greater than those of the reference. There are no FDA action levels for the PAHs analyzed.

#### PCBs

*M. nasuta* - Eight of the PCB congeners tested were detected above the MRL in all five replicates of the project sample. Concentrations of PCB congeners 18, 28, 49, 52, 101, 118, 138, and 153 and total EPA Region 2 PCBs in the project sample were statistically significantly greater than those of the reference; however, the results for all PCB congeners tested were U-qualified for all reference replicates. The total EPA Region 2 PCB mean concentration in the project sample did not exceed the FDA action level.

A. virens - Ten of the PCB congeners tested were detected above the MRL in at least three replicates of the project sample. Concentrations of PCB congeners 18, 49, 52, 101, 118, and 180 and total EPA Region 2 PCBs in the project sample were statistically significantly greater than those of the reference; however, the results for these PCB congeners were U-qualified for all reference replicates. The total EPA Region 2 PCB mean concentration in the project sample did not exceed the FDA action level.

#### **ADDAMS Model**

STFATE modeling was performed using two types of dredging vessels, a clamshell dredge combined with a separate barge or scow and a hopper or cutter dredge. Each type of dredging equipment was modeled with a capacity of 4,800 cubic yards per load based on the largest option currently available in Puerto Rico. In addition, the model was also performed with a volume of 15,000 cubic yards per load in case a larger dredging vessel should become available in the future. All model runs met the disposal criteria for both dredging methods. Therefore, the material may be disposed without location or volume restrictions, to a maximum volume of 15,000 cubic yards per load, within the ODMDS boundaries in accordance with all criteria specified by EPA Region 2 and USACE-Jacksonville District.



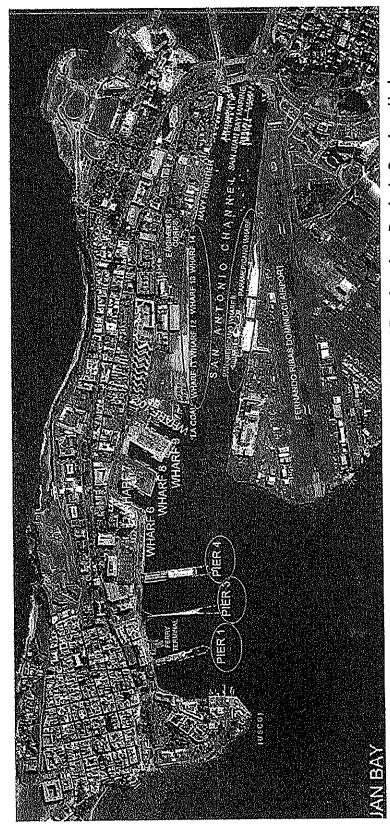


Exhibit 1-2. Location of Piers 1, 3, and 4, Piers 11 through 14, and Pan American Docks in San Juan Harbor (from PWS 2020)



## 1.2 Description of the Testing Approach

### 1.2.1 Evaluation of Dredge Materials for Disposal

Sediment and suspended-phase testing are required under Marine Protection, Research, and Sanctuaries Act (MPRSA) Section 103 to determine the suitability of the material to be dredged for ocean disposal. Section 103 requires that all proposed operations involving the transportation and discharge of dredged material into ocean waters be evaluated to determine the potential environmental impact of such activities. The proposed placement must be evaluated using criteria published by EPA in Title 40 of the Code of Federal Regulations (40 CFR), Parts 220–228. Specific testing methods are described in the Evaluation of Dredged Material Proposed for Ocean Disposal—Testing Manual (EPA and USACE 1991, referred to here as the 'Green Book') and the Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.—Testing Manual (Inland Testing Manual or ITM) (EPA and USACE 1998). In addition, the EPA Region 2 guidance manual, Guidance for Performing Tests on Dredged Material Proposed for Ocean Disposal (RTM) (USACE and EPA 2016), provides regional guidance on procedures to be followed when assessing the suitability of dredge material for ocean disposal in EPA Region 2.

The testing manuals provide guidance to support the tiered testing procedure for evaluating compliance with the limiting permissible concentration (LPC) as defined by the ocean dumping regulations. The procedure includes levels of increasing investigative intensity that provide information to make ocean disposal decisions and is comprehensive enough to enable sound decision-making without unnecessary expenditure of time and resources.

#### 1.2.2 Objectives and Deliverables

Evaluation of proposed dredged material from the project area pursuant to MPRSA Section 103 is required for ocean disposal of dredged material. For this reason, USACE Jacksonville District contracted with ANAMAR Environmental Consulting, Inc. to collect sediment samples and to conduct physical, chemical, and toxicological evaluations as required in 40 CFR Parts 220—228 and outlined in the testing manuals mentioned above.

Throughout the course of this project, the procedures and criteria set forth in the Sampling and Analysis Pian/Quality Assurance Project Plan (SAP/QAPP) for sediment characterization were followed (Appendix A. ANAMAR 2020). The objectives of this effort were to

- Collect the required volume of representative sediment samples from selected stations
  within the project area and the reference station within positioning accuracy appropriate
  for the project objectives.
- Collect and containerize sediment samples according to proper protocols to ensure sample integrity.
- Test and characterize sediment samples for physical characteristics and chemical contaminants of concern and perform toxicology bioassays in accordance with the Green Book and the RTM to determine the suitability of the materials for ocean disposal.
- Demonstrate environmental compliance of sediments to be dredged and obtain concurrence of compliance for offshore disposal of dredged sediments from USACE and EPA according to requirements specified in the Green Book, ITM, and RTM.
- Provide a report to USACE and EPA on behalf of USACE in the format outlined in Section 6.2.6 of the SAP/QAPP (Appendix A).



## Exhibit 1-5. Subcontractors and Responsibilities Associated with This Project

Company and Contact Information	Area(s) of Responsibility
Vibracore Subcontractor: Athena Technologies, Inc. Project Manager: Adam Freeze P.O. Box 68 McClellanville, SC 29458 Phone: (843) 887-3800 adam freeze@athenatechnologies.com	Vibracore support for field sample collection
Chemistry Laboratory: Analytical Resources, Inc. (ARI) Project Manager: Kelly Bottem 4611 S. 134th Pl., Ste. 100 Tukwila, WA 98168-3240 Phone: (206) 695-6211 kelly.bottem@arilabs.com	Laboratory sample preparation and chemical analysis of sediment, elutriate, and tissues; sample holding and archiving
Chemistry Laboratory: Materials Testing Consultants (MTC) Project Manager: Beth Goble 2118 Black Lake Blvd SW; Olympia, WA 98512 Phone: (206) 241-1974 beth.goble@mtc-inc.net	Preparation of elutriate samples
Chemistry Laboratory: ALS Environmental, Inc. Project Manager: Todd Poyfair 1317 S. 13th Ave; Kelso, WA 98626 Phone: (800) 577-7222 Todd.Poyfair@alsglobal.com	Analysis of metals in the elutriate and site water samples
Geotechnical Laboratory: Terracon Project Manager: Chris Martin, Sr. 8001 Baymeadows Way Jacksonville, FL 32256 Phone: (904) 900-6494 crmartin2@terracon.com	Laboratory sample preparation and physical analysis of sediment; sample holding and archiving
Toxicology Laboratory: EcoAnalysts Project Manager: Brian Hester 4729 NE View Drive Port Gamble, WA 98364 Phone: (360) 297-6040 bhester@ecoanalysts.com	Laboratory sample preparation and analysis for suspended phase, solid phase, and bioaccumulation potential
Offshore Vessel J.A.W. Marine Contractors, Inc. Kruger B Research Vessel San Juan, Puerto Rico	Support for field collection of sediment and water from the offshore reference station



# Exhibit 2-1. Summary of Sampling Scheme Including Dredging Units, Sample IDs, and Project Depths

Dredging Unit / Composite ID	Subsample ID	Authorized Project Depth plus Allowable Overdepth below MLLW (feet)
	PRC20-1-A	
Puerto Nuevo Harbor Piers A through D	PRC20-1-8	-33 + (-2) = -35
(PRC20-1-COMP)	PRC20-1-C	
	PRC20-2-A	
Puerto Nuevo Harbor Piers E through O	PRC20-2-B	-39 + (-2) = -41
(PRC20-2-COMP)	PRC20-2-C	
	PIERS20-3-A	-35 + (-2) = -37
Piers 1 through 4	PIERS20-3-B	-36 + (-2) = -38
(PIERS20-3-COMP)	PIERS20-3-C	-30 + (-2)30
	NEWWO20-5-A	
Piers 11 through 14	NEWWO20-5-B	-36 + (-2) = -38
(NEWWO20-5-COMP)	NEWWO20-5-C	-30 + (-2)30
	NEWW020-5-D	

## Exhibit 2-2. Summary of Field Sampling Materials and Methods

## FIELD SAMPLE COLLECTION:

Project subsamples and composite samples from each dredging unit plus reference sediment

#### SAMPLING GEAR:

- Project samples collected by vibracore or grab sampler. A grab sampler was used if shoaling was less than 2 feet.
- Reference sediment collected with double van Veen sampler
- Water parameters measured with YSI multiprobe meter and Hach 2100P turbidimeter

#### PRESERVATION:

- Sediment samples were kept at or below 4°C
- Holding-time requirements were analyte-specific and test-specific

#### IN SITU DATA/OBSERVATIONS:

Conductivity (mS/cm)

рΗ

Sea state

Turbidity (NTU)

Water temperature (°C)

Dissolved oxygen (mg/L and % saturation)

Salinity (ppt)

Tide cycle

Water depth (feet)

Weather observations



## 2.2 Sample Collection Techniques

## 2.2.1 Project Field Effort

Sampling activities were conducted according to the SAP/QAPP (Appendix A) and guidance from USACE and EPA (Section 4.1). Field mobilization and sampling took place October 12 through November 2, 2020. Field personnel consisted of scientists from ANAMAR and Athena Technologies. The *Kruger B* vessel departed from Pier 9 of the Port of San Juan for collection of the reference sediment and reference site water on October 29, 2020. The Athena vessel *Good Vibrations* was used to collect the project samples and site water within the project area. Sample compositing was conducted on-site by ANAMAR personnel prior to shipping samples to the laboratories.

Exhibit 2-4 is a summary of the field sampling, compositing, and shipping activities. For more details, refer to the DQCRs in Appendix B. Breaks in the field sampling schedule reflect mobilization and collection of samples at additional project sites.

Exhibit 2-4. Field Sampling Activities

Date	General Activity
Oct 12 and 19, 2020	<ul> <li>Mobilize to San Juan, PR. Get boat out of customs and stage equipment to begin sampling operations.</li> </ul>
Oct 29, 2020	<ul> <li>Collect samples from PRC20-1, PRC20-2, and PIERS20-3</li> <li>Start sample compositing</li> <li>Collect offshore reference sample and water chemistry kit</li> </ul>
Oct 30, 2020	Collect samples for NEWWO20-5     Complete sample compositing
Oct 31, 2020	Collect site water and background water chemistry kit
Nov 2, 2020	<ul> <li>Pack and prepare project sediment and water samples for shipping</li> <li>Prepare chains of custody</li> <li>Ship samples overnight to laboratories via FedEx Custom Critical</li> </ul>

## 2.2.2 Site Positioning

Sediment sampling locations were provided by USACE and approved by EPA. Station coordinates were uploaded to a Panasonic Toughbook computer and associated Trimble submeter GPS system on the R/V Good Vibrations and a GPS system at the helm of the S/V Kruger B. A Garmin hand-held GPS was used to log sampling coordinates at the aft deck of the Kruger B during sampling. Sampling coordinates were also logged at coring stations with a Garmin hand-held GPS as back-up. Waypoints were recorded on sampling field logs. Navigation and positioning of the sampling vessels referenced above were handled by U.S. Coast Guard-licensed captains under direction of the ANAMAR field team leader. A graduated line was used to determine water depths at coring locations. Water depths during offshore grab sampling were determined using a fathometer.

All samples were taken within 50 feet of the target station and conformed to requirements in the SAP/QAPP. Table 1 contains dates and times, coordinates, water depths, bottom elevations, and associated data for sediment grab and core samples. Table 2 contains information for water column parameters recorded at the offshore reference station and the site water location within San Juan Harbor. The sampling locations for reference and project sediment samples are shown in Maps 1 and 2.

#### MPRSA Section 103 Sediment Characterization Puerto Rico Ports Authority Berthing Areas



vessel *Good Vibrations*, which is fitted for vibracore sampling. The vessel carried all necessary sediment sampling equipment and materials.

The vessel captain navigated to each target using a helms map displayed on a Panasonic Toughbook computer and associated Trimble GPS system. Once on-station, the vessel was immobilized using a three-point anchoring system. Vessel coordinates were compared to station coordinates loaded in a second GPS to confirm location accuracy. Depths were recorded to the nearest inch using lead-line readings and were then converted to the nearest tenths of a foot. Bottom elevation was calculated in the field using real-time water level data (feet MLLW) from NOAA Station ID 9755371 at San Juan. Core penetration required to reach project depth was calculated by adding real-time elevation of the substrate surface (as a negative value) to the project depth.

Athena's vibracore system was deployed from the deck of the vessel and consisted of a generator with a mechanical vibrator attached via cable. This vibrator was attached directly to a 4-inch-diameter stainless steel core barrel. The sampler was lowered to the substrate through a moon pool in the deck of the sampling platform by attaching lengths of drill stem. The vibracore apparatus was then activated and the core barrel penetrated into the sediment until it reached target depth or refusal, whichever was reached first. Vibracore refusal is defined as the point where the core barrel is advanced to depth and additional downward force applied to the vibracore drill stem does not result in measurable penetration into the sediment. This is often the result of the end of the coring tube encountering rock or consolidated sediment.

When the vibracore reached target depth or refusal, the vibracore apparatus was then deactivated and the core retrieved using an electric winch. Once the sample was on-deck, the recovered core length was determined to the nearest inch and converted to the nearest tenths of a foot. Determination of acceptance of a given core sample was based on percent recovery requirements as stated in the SAP/QAPP. The sediment sample was then removed from the core barrel and placed into a stainless-steel bin for characterization, photographs, and containerizing.

When sediment cores are collected with a vibracore system, the retrieved sample is subject to material compaction. For instance, a core sample taken from a penetration depth of 10 feet may result in a recovered core of only 8 to 9 feet in length, depending on the sediment composition. Core samples were considered acceptable if the core was inserted vertically into the sediment, reached target depth or refusal, and recovered at least 75% of penetrated depth. Alternatively, the acceptance limit for each core is decreased in the event that the first core attempted at a given station was below 75% recovery of penetration depth and subsequent cores collected were within  $\pm 15\%$  of the initial core percent recovery. During events when collected cores showed widely varying recoveries over several attempts, the material was collected, and the recovery lengths and reason for low recoveries were recorded on the field sheets.

The number of cores collected at each station was dictated by the number needed to achieve sufficient volume for laboratory analyses. To maintain proportional volumes between subsample stations, the team tried to collect the same number of cores at each station. However, in some circumstances, it was difficult to predict how many cores would be required at each station across a dredging unit because of the requirement to separate out the clay layer from the overlying unconsolidated material. Also, some stations within a dredging unit had less than 2 feet of shoaling and, therefore, required a grab sample. EPA was consulted on this issue and it was recommended that if an equal number of cores could not be collected, an equal volume of material should be collected at each station.



## 2.3 Physical and Chemical Analytical Procedures

## 2.3.1 Physical Procedures

Terracon performed physical analysis of all sediment samples. ANAMAR performed quality assurance/quality control (QA/QC) on sediment physical data and presented the data for all samples in summary tables.

## 2.3.1.1 Grain Size Distribution

Gradation tests were performed in accordance with methods ASTM D-422 and ASTM D-1140. Each representative sample was air-dried and dry-prepped in accordance with method ASTM D-421, and results of the sieve analysis of material larger than a #10 sieve (2.00-mm mesh size) were determined. The minus #10 sieve material was then soaked in a dispersing agent. Following the soaking period, the sample was placed in a mechanical stirring apparatus and then in a sedimentation cylinder where hydrometer readings were taken over a 24-hour period. After the final hydrometer reading was taken, the sample was washed over a #200 sieve (0.075-mm mesh size), placed in an oven, and dried to a constant weight. After drying, the sample was sieved over a nest of sieves to determine the gradation of the material greater than #200 sieve size. Cumulative frequency percentages were graphed and presented by Terracon on USACE Form 2087 (Appendix C).

#### 2.3.1.2 Moisture Content

Moisture content was performed in accordance with method ASTM D-2216-80 and Plumb (1981). The sample weight was recorded and the sample was placed in an oven and dried to a constant mass at 110°C (383.2 kelvin). Once a constant dry mass was obtained, the percent moisture was determined by subtracting the dry mass from the wet mass, then dividing the loss in mass due to drying (the mass of just moisture) by the wet mass. The percent total solids was reported on a 100% wet weight basis.

## 2.3.1.3 Atterberg Limits

Tests for liquid and plastic limits were performed in accordance with ASTM D-4318, wet method, as follows. The minus #40 sieved material was mixed with a small amount of water and placed in a liquid limit device. A groove was cut using a flat grooving tool and the liquid limit was determined by the number of drops of the cup. When the number of drops was in the desired range, a moisture sample was obtained, placed in a 230°C oven, and dried to a constant weight. This was repeated until three determinations had been obtained, one between 15 and 25 blows, one between 20 and 30 blows, and one between 25 and 35 blows. The reported value is the intersecting value at 25 blows when all three are plotted.

The plastic limit was determined by slowly air-drying a small sample left over from the liquid limit determination. The sample was rolled and air-dried until the thread became crumbly and lacked cohesion. When this point was reached, the sample was placed in a tare and weighed, then placed in an oven and dried to a constant weight. The moisture content is the plastic limit.

#### 2.3.1.4 Specific Gravity

Specific gravity was determined in accordance with method ASTM D-854. Each sample was placed in a mechanical stirring device and deionized water was added to form a slurry. The slurry was then transferred to a pycnometer and was de-aired by applying a vacuum. After vacuuming, the pycnometer with sample was allowed to reach thermal equilibrium. The water level was adjusted to a calibration mark, and the pycnometer with sample was weighed. After the



EPA Method	Instrument/ Procedure	Methodology Summary
8081/8082 (Pesticides/PCBs in water/ sediments/ tissues)	Gas Chromatograph	Methods 8081 and 8082 are applicable to the determination of extracted organochlorine pesticide compounds and polychlorinated biphenyl (PCB) congeners from a variety of matrices by gas-chromatography-electron capture detection (GC-ECD). Qualitative identification of an analyte is based on its retention times on dissimilar GC columns. Quantitative analysis may be based on peak areas or height following either external or internal calibrations. Second column confirmation is typically performed and, if the relative percent difference (RPD) is ≤40%, the result is considered confirmed. If the RPD exceeds 40%, errors, chromatographic, and instrument performances are all checked. If the out-of-control situation is still not resolved, the data are reported with qualifiers. When there are no discrepancies between columns, the lower of the two results is typically reported.
8270 (PAHs in sediments/ tissues)	Gas Chromatograph/ Mass Spectrometer	This method is used to determine the concentration of polycyclic aromatic hydrocarbon (PAH) organic compounds in extracts prepared from many types of solid matrices and water samples. The extracted sample aliquot is injected into a gas chromatograph/mass spectrometer (GC/MS) by large-volume injection for qualitative and quantitative determination. Data may be obtained from the mass spectrometer via one of the three modes of operation: full scan mode, selected ion monitoring (SIM), or multiple reaction monitoring (MRM).
Plumb (1981) (TOC in sediments)	Total Organic Carbon (TOC) Analyzer	Plumb (1981) is used to determine the concentration of organic carbon in sediment by catalytic combustion or wet chemical oxidation. The carbon dioxide formed from this procedure is measured and is proportional to the TOC in the sample.

## 2.4 Bioaccumulation and Toxicology Procedures

EcoAnalysts conducted biological testing using sediment samples collected by ANAMAR as part of the dredged material evaluation of Puerto Rico Ports Authority. The testing procedures used by EcoAnalysts (2020) are summarized in Section 2 of their report titled *Toxicity Testing Results*, *Puerto Rico Ports Authority*, *San Juan*, *Puerto Rico*. The complete laboratory report is in Appendix G.

The material under consideration for ocean disposal was evaluated in accordance with procedures and criteria outlined in the Green Book and the RTM and with guidance outlined in the ITM. Biological analyses with reference sediments were performed concurrently with the test sediment evaluations.

This program included bioassay analysis of four composite samples and one reference sample. In addition, appropriate laboratory control samples (LCSs) were run with each of the selected test species. Bioassay testing for this project consisted of three water column bioassays, two whole sediment bioassays, and two whole sediment bioaccumulation potential tests. The bioassay and bioaccumulation tests are summarized in Exhibit 2-8. Exhibit 2-7 summarizes the testing objectives for each sample evaluated under this program. All tests were conducted within the 8-week (56-day) sediment holding time limit.



### 2.6.2 Elutriate and Water Chemistry

Analytical results for elutriate and water samples were compared to the latest published EPA water quality criteria of criteria maximum concentration (CMC [synonymous with 'acute']) established in EPA (2006, 2015). The CMC is an estimate of the highest concentration of a pollutant in saltwater to which an aquatic community can be exposed briefly without resulting in an unacceptable effect (EPA 2006, Buchman 2008).

#### 2.6.3 Toxicology

All water quality and endpoint data were entered into Microsoft Excel spreadsheets. Water quality parameters were summarized by calculating the mean, minimum, and maximum values for each test treatment. Endpoint data were calculated for each replicate, and the mean value and standard deviation were determined for each test treatment.

All hand-entered data were reviewed for data entry errors. Any errors found were corrected before summary calculations were performed. A minimum of 10% of all calculations and data-sorting were reviewed for errors. Review counts were conducted on any apparent outliers.

Statistical comparisons were made according to the Green Book and were performed using SAS/STAT software or CETIS<sup>TM</sup> software (CETIS 2012). Before statistical comparisons were conducted, data were tested for normal distribution. Any data that violated the assumption of normal distribution were transformed using an arcsine square root transformation before statistical analysis. All data were tested for equality of variance using Levene's test.

Benthic test results were compared to reference results using analysis of variance (ANOVA) with SAS Proc GLM software with Dunnett's multiple comparison test on the mean values. The Dunnett's test was performed as a one-way test, testing for significantly lower organism survival than in the reference sample.

## 2.6.4 Tissue Chemistry

The project sample and reference tissues had five replicates per test species and were evaluated using guidance from Subsection 6.3 of the Green Book and Subsection 9.2.3 of the RTM. Analytical results for tissue samples were compared to published tissue screening benchmarks. The U.S. Food and Drug Administration (FDA) action levels and threshold levels were used for comparison after accounting for steady-state adjustments as applicable.

Analyte wet weight concentrations in *Macoma nasuta* tissues were compared to FDA levels for bivalve mollusks. Analyte concentrations in *Alitta virens* tissues were compared to the FDA levels for crustacea as there are no FDA levels published for polychaete worm tissue (FDA 2001, 2011).

The mean of results for each set of five replicates per composite and analyte combination was calculated for wet weight and dry weight concentrations. The wet weight concentrations of composites having two or more replicates greater than the MDL were compared to the replicate concentrations for the reference tissue per analyte. Mean values of analyte concentrations were calculated as follows:

- For non-detects (U-qualified) data, the method detection limit (MDL) was used in all statistical calculations.
- For J-qualified and non-qualified analytical results, the reported result was used in all statistical calculations.



## **3 RESULTS AND DISCUSSION**

#### 3.1 Field Data and In Situ Measurements

#### 3.1.1 Weather Conditions

Conditions during sampling at the offshore reference station and coring locations were favorable. Weather conditions (including wind direction, wind speed, and sea state) at each station are noted on the field logs in Appendix B.

#### 3.1.2 Water Column Data

Water column parameters were recorded at the offshore reference station (SJH20-REF-SW) and at the site water location within the San Juan Harbor project area (SJH20-SW) and are summarized in Table 2 along with the weather conditions observed during water sampling. The water sampling field logs are in Appendix B.

### 3.1.3 Vibracore and Grab Sampling Data

A brief summary of sample collection within each dredging unit is provided below. EPA was consulted throughout the sampling effort, and key issues that were discussed are summarized in Subsection 4.1. Table 1 provides a summary of vibracore sampling data, including core depth, penetration, recovery length, and percent recovery. Copies of the core logs are in Appendix B.

#### Puerto Nuevo Harbor Piers A through D Summary:

PRC20-1-A - Sediment elevation was 1.6 feet above project depth; therefore, a grab sampler was used to collect the sample.

PRC20-1-B - Two cores were collected to project depth.

PRC20-1-C – Sediment elevation was 2.1 feet above project depth. The collection of a core was attempted but material fell out upon retrieval. Therefore, a grab sampler was used to collect the sample.

#### Puerto Nuevo Harbor Piers E through O Summary:

PRC20-2-A - Sediment elevation was 0.9 feet above project depth; therefore, a grab sampler was used to collect the sample.

PRC20-2-B - Two cores were collected to project depth.

PRC20-2-C - Two cores were collected to project depth.

#### Piers 1 through 4 Summary:

PIERS20-3-A - Two cores were collected to project depth.

PIERS20-3-B - Two cores were collected to project depth.

PIERS20-3-C - Two cores were collected to project depth.

#### Piers 11 through 14 Summary:

NEWWO20-5-A – A stiff clay layer was encountered above project depth. EPA was consulted and advised the field team to separate clay material from the overlying material. The clay sample was analyzed separately for physical and sediment chemistry (NEWWO20-5-Clay-COMP).



Puerto Nuevo Harbor Piers E through O

Subsamples and the composite sample from PRC20-2 stations were primarily composed of fine-grained material (silt/clay) ranging from 71.4% to 88.8%. Exhibit 3-2 shows a bar graph of the grain size results. The USCS class for all samples was CH (clay of high plasticity, elastic silt). Complete results are presented in Tables 3 and 4.

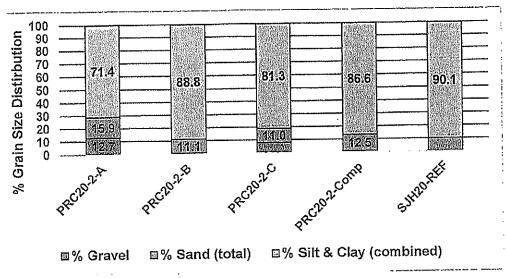


Exhibit 3-2. Grain Size Distribution for Piers E through O

Piers 1 through 4

Subsamples and the composite sample from PIERS20-3 stations were primarily composed of fine-grained material (silt/clay) ranging from 80.9% to 92.3%. Exhibit 3-3 shows a bar graph of the grain size results. The USCS class for all samples was CH (clay of high plasticity, elastic silt). Complete results are presented in Tables 3 and 4.

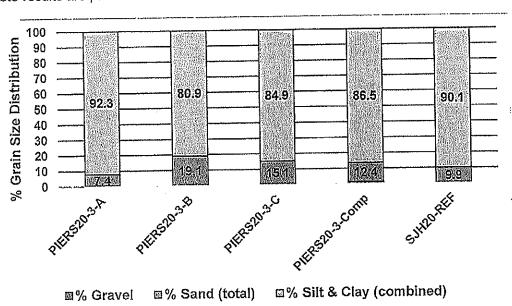


Exhibit 3-3. Grain Size Distribution for Piers 1 through 4

MPRSA Section 103 Sediment Characterization Puerto Rico Ports Authority Berthing Areas



PIERS20-3 composite and subsamples had percent total solids that ranged from 46.10% to 51.93% and TOC concentrations that ranged from 1.08% to 1.70%.

NEWWO20-5 composite and subsamples had percent total solids that ranged from 49.41% to 67.51% and TOC concentrations that ranged from 1.02% to 2.01%. NEWWO-5-Clay-COMP had 76,78% total solids and 0.23% TOC.

The reference had 53.83% total solids and 0.90% TOC. Analytical results for total solids and TOC are in Table 5.

#### 3.3.2 Metals

All nine metals analyzed were detected in concentrations above the MDL in the project composites and subsamples. With the exception of cadmium, all other metals analyzed were also detected in concentrations above the MDL in the reference sample. Exhibit 3-5 summarizes the analytical results for metals in sediment compared to the TEL and ERL. Complete results are provided in Table 6.

#### PRC20-1

PRC20-1-COMP and two or more of the subsamples had concentrations of arsenic, copper, lead, mercury, nickel, silver, and zinc that exceeded the TEL and (or) ERL. In addition, subsample PRC20-1-B had concentrations of chromium that exceeded the TEL. Cadmium was the only metal analyzed that was not detected in concentrations that exceeded the TEL or ERL in either the composite or the subsamples. Among the three subsamples, PRC20-1-B consistently had the highest concentrations of the metals analyzed.

#### PRC20-2

PRC20-2-COMP and all three of the subsamples had concentrations of arsenic, copper, mercury, and nickel that exceeded the TEL and (or) ERL. In addition, subsample PRC20-2-A had concentrations of chromium that exceeded the TEL. Subsample PRC20-2-C had concentrations of silver that equaled the TEL. Subsamples PRC20-2-B and -C had concentrations of zinc that exceeded the TEL. Cadmium and lead were not detected in concentrations that exceeded the TEL or ERL in either the composite or the subsamples.

#### PIERS20-3

PIERS20-3-COMP and all three of the subsamples had concentrations of arsenic, copper, mercury, and nickel that exceeded the TEL and (or) ERL. In addition, subsample PIERS20-3-A had concentrations of lead, silver, and zinc that exceeded the TEL. Cadmium and chromium were not detected in concentrations that exceeded the TEL or ERL in either the composite or the subsamples. Among the three subsamples, PIERS20-3-A consistently had the highest concentrations of the metals analyzed.

#### **NEWWO20-5**

NEWWO20-5-COMP had concentrations of arsenic, copper, lead, mercury, silver, and zinc that exceeded the TEL and (or) ERL. NEWWO20-5-Clay-COMP had concentrations of arsenic and copper that exceeded the TEL and (or) ERL.

#### SJH20-REF

The reference had concentrations of arsenic, copper, and nickel that exceeded the TEL and (or) the ERL.



#### 3.3.3 Pesticides

Two of the 15 pesticides tested [p,p' (4,4')-DDE and p,p' (4,4')-DDT] were detected above the MDL (J-qualified or greater) in one or more samples. For dieldrin, there were no results greater than the MDL (U-qualified), but the MDL (0.11  $\mu$ g/kg) exceeded the ERL of 0.02  $\mu$ g/kg. However, the MDL for dieldrin was below the EPA Region 2 target detection limit of 1  $\mu$ g/kg in Table 13-2 of the SAP/QAPP (Appendix A). Results per reach are summarized below. Complete results are provided in Table 7.

#### PRC20-1

Subsample PRC20-1A had a concentration of p,p' (4,4')-DDE that was greater than the MDL (J-qualified) but did not exceed the ERL or the TEL. Subsample PRC20-1-C had a detected concentration of p,p' (4,4')-DDT (1,22  $\mu$ g/kg) that equaled the TEL of 1.22  $\mu$ g/kg. In one or more of the subsamples, the MDLs and/or MRLs for some of the pesticides were elevated above the EPA Region 2 target detection limit of 1  $\mu$ g/kg. See section 4.4.2.3 for more information. No other pesticides were detected in concentrations greater than the MDLs (U-qualified).

#### PRC20-2

None of the results for the composite or subsamples were detected in concentrations greater than the MDL; all results were U-qualified. The MDLs and MRLs met the EPA Region 2 target detection limit of 1 µg/kg.

#### PIERS20-3

In samples PIERS20-3-COMP, PIERS20-3-B, and PIERS20-3-C, p,p' (4,4')-DDE was detected in concentrations greater than the MDL (J-qualified). Subsample PIERS20-3-A had a detected concentration of p,p' (4,4')-DDT  $(1.29~\mu g/kg)$  that exceeded the TEL of  $1.22~\mu g/kg$ . No other pesticides were detected in concentrations greater than the MDLs (U-qualified). The MDLs and MRLs met the EPA Region 2 target detection limit of  $1~\mu g/kg$ .

#### NEWWO20-5

NEWWO20-5-COMP had a had a detected concentration of p,p' (4,4')-DDT (2.53 μg/kg) that exceeded the TEL of 1.22 μg/kg. The MDLs and MRLs for p,p' (4,4')-DDT were elevated above the EPA Region 2 target detection limit of 1 μg/kg. See section 4.4.2.3 for more information. None of the results for NEWWO20-5-Clay-COMP were detected in concentrations greater than the MDL; all results were U-qualified.

### SJH20-REF

None of the results for the reference were detected in concentrations greater than the MDL; all results were U-qualified. The MDLs and MRLs met the EPA Region 2 target detection limit of 1 µg/kg.



#### 3.3.5 PCBs

Up to 17 of the 22 PCB congeners tested were detected in concentrations above the MDL/MRL in one or more composites. All composites, subsamples, and the reference sample had Total EPA Region 2 PCB concentrations that exceeded the applicable TEL or ERL. The MDLs met the EPA Region 2 target detection limit of 1  $\mu$ g/kg for all samples except PRC20-1-COMP and PRC20-1-B. The MDLs/MRLs for those two samples were above the EPA Region 2 target detection limit of 1  $\mu$ g/kg. See section 4.4.2.3 for more information. Results per reach are summarized below and in Exhibit 3-7. Complete results are provided in Table 9.

#### PRC20-1

In samples PRC20-1-COMP and PRC20-1-A, nine of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In sample PRC20-1-B, 12 of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In sample PRC20-1-C, 11 of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In addition, all samples had Total EPA Region 2 PCB concentrations that exceeded the TEL and ERL. Among the three subsamples, PRC20-1-B consistently had the highest detected concentrations of the PCBs analyzed with the exception of PCB-005/008.

#### PRC20-2

In sample PRC20-2-COMP, six of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In sample PRC20-2-A, two of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In sample PRC20-2-B, nine of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In sample PRC20-2-C, 10 of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In addition, all samples had Total EPA Region 2 PCB concentrations that exceeded the TEL and (or) ERL. Among the three subsamples, PRC20-2-C consistently had the highest detected concentrations of the PCBs analyzed.

#### PIERS20-3

In sample PIERS20-3-COMP, 10 of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In sample PIERS20-3-A, 11 of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In sample PIERS20-3-B, 9 of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In sample PIERS20-3-C, 9 of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In addition, all samples had Total EPA Region 2 PCB concentrations that exceeded the TEL and ERL. Among the three subsamples, PIERS20-3-A consistently had the highest detected concentrations of the PCBs analyzed.

#### **NEWWO20-5**

In sample NEWWO20-5-COMP, 17 of the 22 PCB congeners were detected in concentrations greater than the MDL/MRL. In sample NEWWO20-5-Clay-COMP, none of the 22 PCB congeners were detected in concentrations greater than the MDL (U-qualified). Both samples had Total EPA Region 2 PCB concentrations that exceeded the TEL and (or) ERL.

#### SJH20-REF

In sample SJH20-REF, none of the 22 PCB congeners were detected in concentrations greater than the MDL (U-qualified). The sample had Total EPA Region 2 PCB concentrations that exceeded the TEL.



Exhibit 3-7. Summary of Analytical Results for PCBs in Sediment

Exilibit 0-1.								***************************************	tration (µg	alker No. 10 Miles	Sattanner	annes e e	in in the second	Harris de la Constantina de la Constant La constantina de la	NAMES OF STREET	XII SEE COUR	Newscares
					ng amang ka			Sample II			enavanaen Referensiste				anynan anar Malasia ana	tananan Isanasa	RESEASE
	SJH20 PRC20-1-			the state of the s		PIERS20-3-			NEWWO20-5-								
Analyte	REF	COMP	A	В	С	COMP	A	В	C	COMP	A	В	C	COMP	Clay-	TEL	ERL
PCB-005/008	ND	ND	NĐ	ND	1.05	ИÐ	ND	ND	ND	ND	ND	ND	ND	1.81	ND	х	×
PCB-018	ND	ND	ND	6,66	ND	ND	ND	ND	ND	1,28	1.14	ND	ND	2.80	ND	×	×
PCB-028	ND	5,70	ND	10.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,20	ND	×	×
PCB-044	ND	ND	ND	ND	ND	ΝĐ	ND	ND	ИD	ND	МĐ	ND	ND	1.08	ND	×	×
PCB-049	ND	21,2	1.97	47.0	2.80	МD	ND	1.49	1,62	2.30	3.55	1.90	1,17	5,53	ND	×	×
PCB-052	ND	14.6	1.77	31.3	2.37	ND	ND	ND	1.85	2.11	3.19	1.98	1.19	5.38	ND	×	x
PCB-066	ND	ND	ND	7.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.75	ND	×	×
PCB-087	ND	ND	ND	ND	ND	ND	ND	ДИ	ND	ND	ND	ND	ND	ND	ND	x	×
PCB-101	ND	8.25	ND	16.1	3.10	1.60	ND	2,53	2.96	2.33	ND	1.96	1.64	4.55	ND	х	×
PCB-105	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ФИ	ND	ND	×	x
PC8-118	QИ	ND	1.94	ND	1,83	ND	ND	1.71	1,82	1.87	2.44	1.44	1.32	3.69	ND	×	×
PCB-128	ND	ND	ND	NĐ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	×	×
PCB-138	ИD	11.7	7.07	23.3	7,24	3.4D	1,01	5.94	6,13	3.64	4.53	2.B2	2.65	5.88	ND	×	×
PCB-153	ND	24.7	15.4	57.1	14.1	6.16	1.85	10.8	11.0	8.17	9,82	6,38	5.37	10.6	ND	x	×
PCB-170	ND	6.53	3.87	11.9	3.31	1.45	ND	2.41	2.41	1.43	1.68	1.09	1.01	1,86	ND	х	×
PCB-180	ND	13.7	8.26	26.3	7.10	2,96	ND	5.16	5.17	2,84	3.42	2.14	1.95	3.81	ND	x	x
PCB-183	ND	ΝĐ	2.24	7.32	2.00	ND	ND	1.46	1.52	ND	1.11	ND	ND	1.54	ND	x	×
PCB-184	ND	ND	ND	МĐ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	х	×
PCB-187	ND	9,76	5.86	18.2	5,38	2.35	ND	3.96	4.08	2.45	2,92	2.00	1.71	2,91	ND	x	×
PCB-195	ND	ND	ND	ОИ	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	×	×
PCB-206	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,12	ND	x	×
PCB-209	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.15	ND	ND	1.69	ND	×	×
Total EPA Region 2 PCBs	22.0	180	61.4	313	61.3	33.8	22.5	48.3	50.6	40.3	46.0	28.1	30.8	63.2	22.0	21.6	22.7

Bolded values exceeded the TEL and/or ERL.

Non-detect (ND) = The analyte was not detected at or above the MDL.

x = No TEL or ERL published for that parameter.

See Table 9 for complete results.



Exhibit 3-8. Summary of Survival Data for the 10-Day Benthic Test with Ampelisca abdita

Q1707 W17 221			
Sample ID	Mean % Survival (± SD)	Statistically Significantly Less Than Reference?	Meets LPC Criteria (mean % survival within 20% of Reference?)
Control	96 (± 4.2)		
SJH20-REF (reference)	90 (± 6.1)		
PRC20-1-COMP	90 (± 5.0)	No	Yes
PRC20-2-COMP	83 (± 8.4)	No	Yes
PIERS20-3-COMP	86 (± 5.5)	No	Yes
NEWWO20-5-COMP	84 (± 9.6)	No	Yes

SD = standard deviation

Source: Table 3-1 of EcoAnalysts (2021)

## 3.5.2 Americamysis bahia

The 10-day benthic test with *A. bahia* was initiated on December 8, 2020, and was validated by 90% survival in the control, meeting the acceptability criterion of ≥90%. Mean survival in the project sediment composite was 93% and was not statistically significantly different from that of the reference. Mean percent survival in the project sediment composite was within 10% of the reference (94%), indicating that the project sediment met the LPC for ocean disposal. Mean survival results are summarized in Exhibit 3-9.

Water quality parameters, ammonia concentrations, and other test conditions are summarized in Tables 3-6 through 3-8 of the toxicity report by EcoAnalysts (2021) in Appendix G. A summary table of survival in each replicate and the raw data bench sheets are provided in Appendix A.2 of the toxicity testing report (Appendix G).

Exhibit 3-9. Summary of Survival Data for the 10-Day Benthic Test with Americamysis bahia

Dania			
Sample ID	Mean % Survival (± SD)	Statistically Significantly Less Than Reference?	Meets LPC Criteria (mean % survival within 10% of Reference?)
Control	90 (± 3.5)		
SJH20-REF (reference)	94 (± 5.5)		
NEWWO20-5-COMP	93 (± 5.7)	No	Yes

SD = standard deviation

Source: Table 3-5 of EcoAnalysts (2021)

## 3.6 Water Column Bioassays

Water column tests were performed with the mysid crustacean *Americamysis bahia* (opossum shrimp), the atherinoid fish *Menidia beryllina* (inland silverside), and the larval life stage of the bivalve mollusk *Mytilus galloprovincialis* (Mediterranean mussel). The complete toxicity testing report by EcoAnalysts (2021) is provided in Appendix G.



Exhibit 3-11. Summary of Survival Data for Water Column Tests Using Menidia beryllina

Sample ID	Concentration (%)	Mean % Survival (± SD)	Statistically Significantly Less Than Control?	LC <sub>50</sub> (%)
Control		92 (± 9.7)		
PRPA-SW (site water)		96 (± 6.5)	No	.*
	10	95 (± 5.0)	No	>100
NEWWO20-5-COMP	50	92 (± 6.7)	No	>100
(elutriate)	100 -	98 (± 2.7)	No	>100

SD = standard deviation

Source: Table 3-13 of EcoAnalysts (2021)

## 3.6.3 Mytilus galloprovincialis

The water column test with larval *M. galloprovincialis* was initiated on December 8, 2020, and resulted in 99.0% normal development (proportion normal) and 99.9% survival (proportion survival) in the control, meeting the recommended criteria of ≥60% proportion normal and ≥90% proportion survival. Control acceptability results are summarized in Exhibit 3-12. Mean combined normal development and mean survival results for all samples are summarized in Exhibits 3-13 and 3-14.

Water quality parameters, ammonia concentrations, and other test conditions are summarized in Tables 3-20 through 3-22 of the toxicity report by EcoAnalysts (2021) in Appendix G. A summary table of survival in each replicate and the raw data bench sheets are provided in Appendix A.5 of the toxicity testing report (Appendix G).

The estimated EC $_{50}$  value for mean proportion normal and proportion survival was >100% for sample NEWWO20-5-COMP, and statistical comparison of the sample results to that of the control resulted in no significant difference.

Exhibit 3-12. Mytilus galloprovincialis Control Acceptability Results

Treatment	Mean Proportion	Mean Combined	Meets Acceptability
	Survival (%)	Normal Development	Criteria?
Control	99.9	99.0	Yes

<sup>&</sup>lt;sup>1</sup> Calculated as the total number of normally and abnormally developed embryos ÷ number of embryos stocked (stocking density).

Source: Table 3-17 of EcoAnalysts (2021)



Exhibit 3-15. Summary of Survival Data for Bioaccumulation Potential Tests Using Macoma nasuta and Alitta virens

	Mean % Survival (± SD)				
Sample ID	M. nasuta	A, virens			
Control	100 (± 0.0)	96.1 (± 3.5)			
SJH20-REF (reference)	96.8 (± 3.3)	96.0 (± 6.5)			
NEWWO20-5-COMP	97.6 (± 2.2)	97.0 (± 2.7)			

SD = standard deviation

Source: Table 3-23 of EcoAnalysts (2021)

## 3.8 Toxicology Summary

#### Benthic Bioassays

No significant benthic toxicity, relative to the reference treatment, was observed in the *A. abdita* amphipod test or the *A. bahia* mysid test. Mean percent survival in the project composite samples was within the taxon-specific test criterion (20% of the reference for amphipod; 10% of the reference for mysid), indicating that the test treatments met the LPC for disposal for these tests.

#### Water Column Bioassay

No statistically significant toxicity was observed in the 100% elutriate concentrations for the *A. bahia, M. beryllina*, and *M. galloprovincialis* tests.

## Bioaccumulation Potential

No significant toxicity was observed in the bioaccumulation tests. Survival in the reference and test treatments was ≥96.0%, suggesting adequate tissue mass was available for chemical analyses.

## 3.9 Tissue Chemistry

Tissue chemistry results for *M. nasuta* and *A. virens* are presented in Tables 13 through 30. Wet weight tissue chemistry results for the one project sample (NEWWO20-5-COMP) are compared to the reference (SJH20-REF) and to applicable FDA action levels from FDA (2001, 2011). The laboratory case narrative for tissue chemistry is provided in Appendix D. Complete results of statistical analyses and transformations for *M. nasuta* and *A. virens* are provided in Appendix F.

For dry weight tables, the laboratory's information management system is not currently able to provide both wet and dry weight concentrations. The results reported were calculated using the wet weight concentration and percent solids provided by the laboratory.

## 3.9.1 Lipids and Total Solids in Tissue

Total solids and lipids were analyzed in *M. nasuta* and *A. virens* tissues for the project sample (NEWWO20-5-COMP) along with the reference and pre-exposure tissues.

#### Macoma nasuta

Total solids ranged from 16.46% to 18.44% among the project samples, reference, and preexposure tissues. Lipids ranged from 1.2% to 2.5% among these samples. Complete results are in Table 13.



Exhibit 3-17. Alitta virens Tissue: Summary of Mean Wet Weight Metals Results

		Concentration (mg/kg)		
	Mean Concentrati			
Analyte	NEWWO20-5-COMP	SJH20-REF (reference)	FDA Action Level	
Arsenic	2.08	2.02	76	
Cadmium	0.0248	0.0257	3	
Chromium	0.208	0.191	12	
Copper	1.47	1.47	X	
Lead	0.178	0.119	1.5	
Mercury	0.0157	0.0187	1	
Nickel	0.122	0.114	70	
Silver	0.0213	0.0123	X	
Zinc	14.8	14.5	×	

x = No FDA action level is published for the given parameter.

Bolded values indicate that the mean concentration in project tissues is statistically significantly greater than in the reference tissues, and at least two replicate results are greater than the MDL.

## 3.9.3 Pesticides in Tissue

Fifteen pesticides were tested in M. nasuta and A. virens tissues from the project sample (NEWWO20-5-COMP) along with the reference and pre-exposure tissues.

#### Macoma nasuta

None of the pesticides were detected in concentrations greater than the MRL in the project sample or reference. All results were either U- or J-qualified. Mean concentrations of two pesticides (4,4'-DDD and 4,4'-DDE) in the project sample were statistically significantly greater than those of the reference; however, the reference results were U-qualified for these two pesticides. None of the mean concentrations of pesticides exceeded applicable FDA action levels. Complete results are in Tables 19 and 21 for wet weight and dry weight pesticides, respectively. Results of the ToxCalc statistical calculations are provided in Appendix F.

#### Alitta virens

None of the pesticides were detected in concentrations greater than the MRL in the project sample or the reference. All results were either U- or J-qualified. Mean concentrations of 4,4'-DDD in the project sample were statistically significantly greater than those of the reference. None of the mean concentrations of pesticides exceeded applicable FDA action levels. Complete results are in Tables 20 and 22 for wet weight and dry weight pesticides, respectively. Results of the ToxCalc statistical calculations are provided in Appendix F.

## 3.9.4 PAHs in Tissue

Sixteen PAHs were tested in M. nasuta and A. virens tissues for the project sample (NEWWO20-5-COMP) along with the reference and pre-exposure tissues. Total LMW, total HMW, and total PAHs were calculated from the results of the individual PAHs.



Exhibit 3-19. Macoma nasuta Tissue: Summary of Mean Wet Weight PCBs Results

	Concentration (mg/kg)			
	Mean Concentration			
Analyte	NEWWO20-5-COMP	SJH20-REF (reference)	FDA Action Level	
PCB 5/8	0.41	<0.40	×	
PCB 18	0.47	<0.40	×	
PCB 28	0.66	<0.40	X	
PCB 44	<0.40	<0.40	×	
PCB 49	1.06	<0.40	×	
PCB 52	0.98	<0.40	X	
PCB 66	<0.40	<0.40	×	
PCB 87	<0.40	<0.40	×	
PCB 101	0,69	<0.40	×	
PCB 105	<0.40	<0.40	X	
PCB 118	0.44	<0.40	X	
PCB 128	<0.40	<0.40	X	
PCB 138	0.54	<0.40	X	
PCB 153	0.89	<0.40	X	
PCB 170	<0.40	<0.40	X	
PCB 180	<0.40	<0.40	X	
PCB 183	<0.40	<0.40	X	
PCB 184	<0.40	<0.40	X	
PCB 187	<0.40	<0.40	· x	
PCB 195	<0.40	<0.40	X	
PCB 206	<0,40	<0.40	X	
PCB 209	<0.40	<0.40	x	
Total EPA Region 2 PCBs	11.3	8.80	2000	

x = No FDA action level and (or) ecological effects threshold is published for the given parameter.

Bolded values indicate that the mean concentration in project tissues is statistically significantly greater than in of the reference tissues and at least two replicate results are greater than the MDL.

## Alitta virens

Ten of the PCB congeners tested were detected above the MRL in at least three replicates in the project sample. Concentrations of PCB congeners 18, 49, 52, 101, 118, and 180 and total EPA Region 2 PCBs in the project sample were statistically significantly greater than those of the reference. Total EPA Region 2 PCB mean concentration in the project sample did not exceed the FDA action level. Mean concentrations of PCBs in *A. virens* tissues are summarized in Exhibit 3-21. Complete results are in Tables 28 and 30 for wet weight and dry weight PCBs, respectively. Results of the ToxCalc statistical calculations are provided in Appendix F.

<sup>&</sup>lt; #.## = The analyte was not detected (ND) at or above the MDL.



## 4 QUALITY ASSURANCE/QUALITY CONTROL

## 4.1 Coordination with EPA

EPA Region 2 was consulted during the sample collection effort for guidance on how to approach sample collection and processing at several stations.

General guidelines provided by EPA:

• Based on bathymetric data, there were some stations with very short estimated cores lengths. EPA advised that if shoaling is <2 feet above the target project depth, permission was granted to collect the material as a grab sample.

A memo was prepared summarizing the field coordination with EPA and a copy was provided to USACE and EPA. The memo is also provided in Appendix J, Pertinent Correspondence.

## 4.2 Sample Receipt

Sediment and site water samples requiring temperature preservation were shipped using cold storage containers and coolers with ice on November 2, 2020. Those samples were delivered to EcoAnalysts on November 3, 2020. Samples that did not require cold storage were shipped to ANAMAR in a cargo container. A summary of receipt dates to each laboratory is provided below.

### 4.2.1 EcoAnalysts

The cold storage containers and all coolers were received at EcoAnalysts on November 3, 2020. This shipment included samples for both chemical and toxicological analysis. All test samples arrived in a cold box at  $4.2^{\circ}$ C, within the recommended temperature range of 0-6°C upon receipt. EcoAnalysts took custody of five sediment samples and one site water sample for toxicological analysis. The samples were stored in a walk-in cold room at  $4^{\circ} \pm 2^{\circ}$ C in the dark until used for testing. ARI took custody of all the remaining samples for sediment, site water, and elutriate chemistry analysis.

## 4.2.2 ARI, MTC, and ALS

ARI personnel took custody of all the samples for sediment, site water, and elutriate chemistry analysis. ARI delivered sediment and site water on November 3, 2020, to MTC for elutriate preparation and to ALS on November 4, 2020, for sediment and site water analysis. Following elutriate preparation, MTC delivered the elutriate samples for organic analysis to ARI on November 10, 2020, and elutriate samples for trace metals analysis to ALS on November 11, 2020. All samples were received at the laboratories within analytical holding time and at proper temperature.

## 4.2.3 ALS and Terracon

The cargo container was delivered to ANAMAR on November 13, 2020. ANAMAR packed and shipped the site water on November 16, 2020, and it was received at ALS on November 18, 2020. ANAMAR delivered sediment samples for physical analysis to Terracon on November 19, 2020. All samples were received in good condition.

## 4.3 Physical Analysis

All physical analyses were performed by Terracon, and the results met the quality control criteria specified in the SAP/QAPP.



## 4.4.3.2 Continuing Calibration Verification

Pyrene had two exceedances in the CCV standards. All other standards were acceptable. The results indicate a slight low bias for pyrene. For the samples analyzed during the CCV exceedances, only sample PIERS20-3-A had a concentration that exceeded the Region 2 target reporting limits. Sample PIERS20-3-COMP, which included material from subsample PIERS20-3-A, was analyzed 2 days later and with CCVs that were within control. The concentrations found in PIERS20-3-COMP were consistent with the concentrations found across all three subsamples.

## 4.5 Site Water and Elutriate Chemistry

## 4:5.1 Trace Metals

The triplicate matrix spike for arsenic, cadmium, and copper were below the acceptance limits, but all other spikes were acceptable.

The spike target for chromium, lead, and nickel did not meet the criteria specified in the EPA Region 2 Manual. The laboratory indicated that the method could not meet both the low levels needed for reporting limits for metals such as copper and also meet the spike target for metals with high reporting limits for chromium, lead, and nickel. The spike recoveries were acceptable for the percent recoveries found.

## 4.5.2 Pesticides and PCB Congeners

## 4.5.2.1 Matrix Spike Recovery

Several spike recoveries for PCBs and pesticides were outside the acceptance limits, indicating a matrix interference. Since all pesticide and PCB concentrations were below the detection limit, the overall impact on the sample results is low.

## 4.5.2.2 <u>Laboratory Control Standards</u>

Several compounds were outside the acceptance limits for the background site water. Results for elutriate samples were within control.

## 4.6 Tissue Chemistry

#### 4.6.1 Trace Wetals

No anomalies associated with the analysis of the samples were observed.

## 4.6.2 Pesticides and PCB Congeners

## 4.6.2.1 Matrix Spike Recovery

Spike recoveries for several pesticide compounds were outside the acceptance limits, indicating a potential matrix interference. Since the sample results were below detection limit, the overall impact is minimal.

### 4.6.2.2 Laboratory Control Sample

Recoveries for Endosulfan I and II were outside the acceptance limits for one LCS but were within acceptance limits for the second LCS. All other pesticides and PCB congeners were within acceptance limits.

No other anomalies associated with the analysis of these samples were observed.



Water quality parameters were within acceptable limits throughout the 10-day test, except for pH. While pH was measured at 8.5 in the control treatment, above the targeted range of  $7.8 \pm 0.5$ , it was still within the tolerance range of the test organism and did not negatively affect survival.

The LC<sub>50</sub> for the ammonia reference-toxicant test was 61.6 mg/L total ammonia and was within two standard deviations of the laboratory mean at the time of testing. This indicates that the test organisms used in this test were of similar sensitivity to those previously tested at the EcoAnalysts laboratory. The concurrent ammonia reference-toxicant derived no observed effects concentration (NOEC) values were 34.7 mg/L (total ammonia) and 0.591 mg/L (un-ionized ammonia [UIA]). Ammonia concentrations measured within the benthic test were below the ammonia reference-toxicant test derived NOEC values for total ammonia throughout the testing period. UIA concentrations measured in samples PRC20-1-Comp and PIERS20-3-Comp exceeded the NOEC for UIA on days 3 and 2 of testing, respectively.

## 4.7.1.2 Americamysis bahia

The 10-day benthic test with *A. bahia* was only run on sample NEWWO20-5-Comp. The test was initiated on December 8, 2020, and was validated by 90% survival in the control sample, meeting the acceptability criterion of ≥90%. Mean survival within the *A. bahia* benthic test was 93% in the test sediment; this was not statistically different than that of the reference. Mean percent survival was within 10% of the reference (94%), indicating that the test composite met the limiting permissible concentration for disposal.

Water quality parameters were within the acceptable limits throughout the 10-day test. Ammonia measurements in overlying water were below the threshold of 0.3 mg/L UIA (@pH 7.8) throughout the duration of the test. No afternoon feeding was performed on Day 1 of testing due to a shortage of hatched *Artemia* available for feeding.

The LC $_{50}$  for the ammonia reference-toxicant test was 46.3 mg/L total ammonia and was within two standard deviations of the laboratory mean at the time of testing. This indicates that the test organisms used were of similar sensitivity to those previously tested at the EcoAnalysts laboratory. The concurrent ammonia reference-toxicant derived NOEC values were 21.7 mg/L (total ammonia) and 0.380 mg/L (UIA). Ammonia concentrations measured within the benthic test were below the ammonia reference-toxicant test derived NOEC values throughout the testing period.

## 4.7.2 Water Column Toxicology Testing

The results of the water column toxicity tests are presented in this section. The water column tests were performed with mysid shrimp (*A. bahia*), inland silverside fish (*M. beryllina*), and larvae of the mussel *M. galloprovincialis*.

## 4.7.2.1 Americamysis bahia

The water-column test with *A. bahia* was initiated on December 7, 2020. The mysid test was validated by 96% mean survival in the seawater control, meeting the acceptability criterion of ≥90%. Mean percent survival in the site water sample was 97%, indicating that the site water was acceptable for testing.

Water quality parameters were within the target limits throughout the duration of the 96-hour test. No afternoon feeding was performed on Day 2 of testing due to a shortage of hatched *Artemia* available for feeding.

### MPRSA Section 103 Sediment Characterization Puerto Rico Ports Authority Berthing Areas



The LC $_{50}$  for the *A. virens* sodium dodecyl sulfate (SDS) reference-toxicant test was 36.8 mg/L SDS and was within two standard deviations of the laboratory mean at the time of testing. The LC $_{50}$  for the *M. nasuta* reference-toxicant test was 39.9 mg/L SDS and was within two standard deviations of the laboratory mean at the time of testing. These reference-toxicant tests indicated that the populations of test organisms used in this study were similar in sensitivity to those previously tested at the EcoAnalysts laboratory.



## Exhibit 5-2. Site Description

Parameter	Value	Units
Number of Grid Points (left to right)	96	n/a
Number of Grid Points (top to bottom)	96	n/a
Spacing Between Grid Points (left to right)	200	ft
Spacing Between Grid Points (top to bottom)	200	ft
Constant Water Depth	965	ft
Roughness Height at Bottom of Disposal Site	0.005*	ft
Slope of Bottom in X-Direction	0	deg.
Slope of Bottom in Z-Direction	0	deg.
Number of Points in Ambient Density Profile Point	3	n/a
Ambient Density at Depth = 0 ft	1.0236	g/cc
Ambient Density at Depth = 200 ft	1.0242	g/cc
Ambient Density at Depth = 965 ft	1.0279	g/cc
Distance from the Top Edge of Grid (upper left corner of site)	6,500	ft
Distance from the Left Edge of Grid (upper left corner of site)	12,800	ft
Distance from the Top Edge of Grid (lower right corner of site)	12,500	ft
Distance from the Left Edge of Grid (lower right corner of site)	18,800	ft
Number of Depths for Transport-Diffusion Output	3 (0, 450 and 960)	#

<sup>\*</sup> Model default value

## Exhibit 5-3. Current Velocity Data

Parameter	Value	Units
X-Direction Velocity	0	ft/sec
Z-Direction Velocity	-1	ft/sec

#### Exhibit 5-4. Material Data

Parameter	Value	Units
Dredging Site Water Density (average)	1.022	g/cc
Number of Layers	1	n/a
Material Velocity at Disposal (X-Dir.)	0	ft/s
Material Velocity at Disposal (Z-Dir.)	-13.5	ft/s

## Exhibit 5-5. Output Options

Parameter	Value	Units
Duration of Simulation	14,400	seconds
Long-Term Time Step	600	seconds



Results of the initial mixing simulations after 4 hours of mixing (specified for water column evaluation) and the maximum concentration found outside the disposal area for each dredging unit are summarized in Exhibit 5-8. The location of the maximum concentration is shown as X location and Z location. Input and output files are provided in Appendix H.

Exhibit 5-8. Four-Hour Criteria and Disposal Site Boundary Criteria after Initial Mixing

	Four Hour Disposal Criteria			Disp	osal Boundary	Criteria	
Depth, feet	% Max Conc above Background on Grid	Dilution on Grid (D₂-tex)	X Location	Z Location	Time, hours	Max Conc Outside Disposal Area	Dilution (Datox)
Sample	NEWWO	20-5-COMP (	Clamshell	Dredge (4	4,800 cu	ibic yards/load	)
0	1.00E-40	>10,000	7,200	200	0.50	1.65E-39	>10,000
450	1.88E-24	>10,000	9,400	1,000	4.0	1.88E-24	>10,000
879 (max)	5.47E-03	>10,000	9,400	1,000	0.83	5.39E-02	1854
960	9.27E-04	>10,000	9,400	1,000	0,83	9.26E-03	>10,000
Sample	NEWWO2	0-5-COMP C	lamshell	Dredge (1	5,000 c	ubic yards/load	i)
0	3.81E-40	>10,000	6,800	200	0.50	3.95E-39	>10,000
450	3.81E-40	>10,000	6,800	200	0.50	3.95E-39	>10,000
918 (max)	2.09E-02	4784	9,400	1,000	0.83	1.53E-01	653
960	4.23E-03	>10,000	9,400	1,000	0.83	3.25E-02 ·	3076
Sample	NEWWO20	-5-COMP Ho	pper/Cut	er Dredge	(4,800	cubic yards/lo	ad)
0	6.08E-40	>10,000	7,000	200	0.50	9.97E-39	>10,000
450	1.78E-02	5617	9,400	1,000	0.83	1.16E-01	861
473 (max)	3.33E-02	3002	9,400	1,000	0.83	3.56E-01	280
960	6.08E-40	>10,000	7,000	200	0.50	9.97E-39	>10,000
Sample	NEWWO20	NEWWO20-5-COMP Hopper/Cutter Dredge (15,000 cubic yards/load)					
0	9.19E-40	>10,000	7,200	200	0.50	1.48E-38	>10,000
450	5,27E-16	>10,000	9,400	1,000	4.0	5,27E-16	>10,000
879 (max)	5.02E-02	1991	9,400	1,000	4.0	5.03E-01	198
960	8.21E-03	>10,000	9,400	1,000	0.83	8.32E-02	1201

Dilution ( $D_{e-tox}$ ) = (100 - max conc.)/max conc.

#### Conclusion

STFATE modeling was performed using two types of dredging equipment, a clamshell dredge combined with a separate barge or scow and a hopper or cutter dredge. Each type of dredging equipment was modeled with a capacity of 4,800 cubic yards per load based on the largest option currently available in Puerto Rico. In addition, the model was also performed with a volume of 15,000 cubic yards per load in case a larger dredging vessel should become available in the future. All model runs met the disposal criteria for both dredging methods and volumes. Therefore, the material may be disposed without location or volume restrictions, to a maximum volume of 15,000 cubic yards per load, within the ODMDS boundaries in accordance with all criteria specified by EPA Region 2 and USACE-Jacksonville District.

Exhibits 5-9 and 5-10 show an aerial map of the ODMDS in relation to the coast of Puerto Rico and a computer-generated image showing specific site details, respectively.

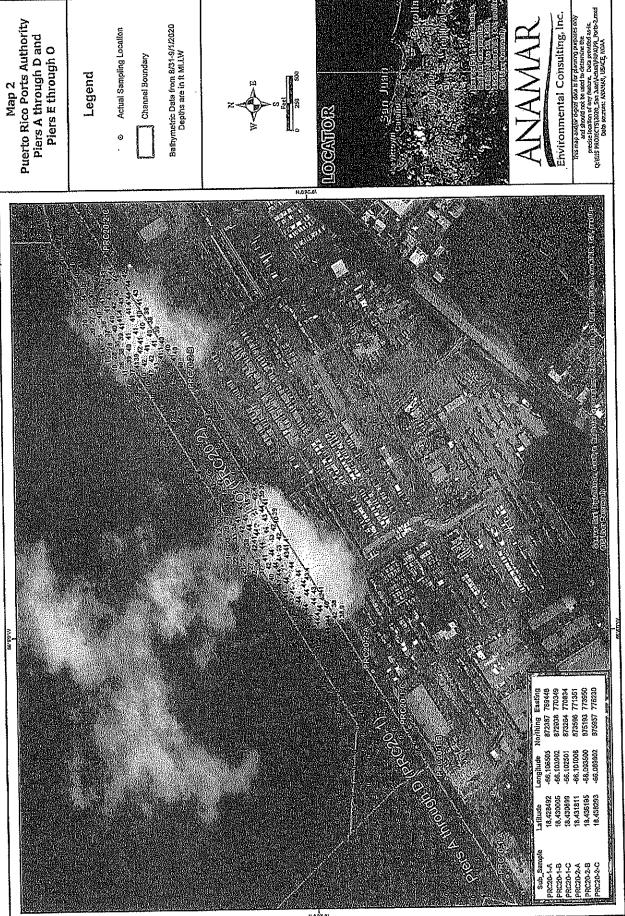


# San Juan ODMDS Disposal Map

Disposal Grid: Disposal Area 96 grids x 96 grids 6,000 x 6,000 ft All grids are 200 ft x 200 ft Position of disposal is at center Total grid is 19,000 ft x 19,000 ft (9,500 ft x 15,800 ft) Northwest Comer 6,500 ft x 12,800 ft Current Velocity: X-Direction: 0 ft/s Z-Direction:-1 ft/s Material Velocity: X-Direction: 0 ft/s Z-Direction: -13.5 ft/s Southeast Corner 12,500 ft x 18,800 ft

Exhibit 5-10. Computer Generated Map of San Juan Harbor ODMDS

Results of the STFATE module of the ADDAMS model indicate that all material from dredging unit NEWWO20-5-COMP may be disposed of at the center of the San Juan ODMDS using a hopper dredge or clamshell with a scow or barge with a carrying capacity of up to 15,000 cubic yards per load without violating applicable disposal criteria.



# Acronyms and Qualifiers in Tables

**Grain Size Definitions** 

Gravel Particles ≥4.750 mm

Silt

Particles 0.005-0.074 mm

Sand Particles 0.075-4.749 mm

Clay Particles < 0.005 mm

#### Unified Soil Classification System (USCS) classes

CH Clay of high plasticity, elastic silt

CL Clay

SC Clayey sand

SM Silty sand

SP Poorly-graded sand

MH Silt of high plasticity, elastic silt

ML Silt of low plasticity

OH Organic clay, organic silt

### Metals Data Qualifiers

- J The result is an estimated value.
- U The analyte was analyzed for but was not detected ("Non-detect") at or above the MRL/MDL. DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.

#### Organics Data Qualifiers

- \* Flagged value is not within established control limits.
- J Estimated concentration value detected below the reporting limit.
- PI The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- Y1 Raised reporting limit due to interference
- ND Analyte NOT DETECTED at or above the reporting limit
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)

## Acronyms and Symbols Used in Tables

CMC criteria maximum concentration

EC<sub>50</sub> effective concentration affecting 50% of a population

ERL effects range-low

FDA U.S. Food and Drug Administration

high molecular weight PAHs (NOAA 1989)

LC<sub>50</sub> lethal concentration affecting 50% of a population

LL liquid limit

low molecular weight PAHs (NOAA 1989)

MDL method detection limit
MLLW mean lower low water
MRL method reporting limit

NAD 83 North American Datum of 1983

ND non-detect





TABLE 1 Vibracore an	d Grab Sam	Vibracore and Grab Sample Summary											AND STREET, ST		
** ************************************	and the second	THE PERSON NAMED IN	100 St. 100 St	48 di		の変数を	· · · · · · · · · · · · · · · · · · ·	銀路等	Market Services	Helric	Metrics Per Core Sample	aldie			
										Sediment		Botton 81			
		Clay Layer or Physical Layer					e se Georgia	Water	Tide	<del></del>	- 5	. <del> </del>	Recovery Length	Recovery per Com	Notes
Chair	Subsample ID		Date		Easilng	~	≆	((ee])	(feet; MECV)	Heat, McCW	(legg)	יייי שורביי	1		Greb sample collected because <2 ft of shoaling.
Dread Minate	PRC20-1-Λ	3	10/29/2020	9,35	872387	769448	ş	e 48	2	*****	7.5	097	3.0	88	As material above project death was characteristic of maintenance material. Did not encounter
Harbor	PRC20-1-B	1	19/29/2020	30,05	872938	770343	*	33.1	5	31.6	3.5	-35.0	22	26	Az hatensa econo project cap layer above project depth-
Prers A			0.000000	10.05	736424	¥58077	25.	34.3	12	-32.9	,	,	1	1	Grab sangta collected because <2 ft of shoelbig.
	PRC20-1-C	_	I DISSISSION	K	202020		Ŧ	41.5	3	-40,1	-	-	,	,	Grab sample collected because <2 ft of shoaling.
	PRC20-2-A	1	10/29/2020	┷	DEC 10	╬					43	41.0	5	83	All material above project depth was characterists of maintenance material. Did not encounter
Puerto Nuevo	PRC20-2-B	ı	107202020	11340	875193	773950	7	37.9	1,2	7.36.	6,5	44.0	4.3	100	had day layer shove project depth.
Piers El						_	-				6,0	41.0	3,8	56	All material abone project depth was characteriste of maintenance material. Bid not encounter
C riguositi O	PRC20-2-C	1	10/29/2020	12:00	875957	775230	7	38.1	<b>7</b>	0.75	4.0	41.0	3.5	88	hard clay layer above project ucpur.
	A CONTROL OF THE PARTY OF THE P			- Anthropological					2000		6,3	-37.0	4.6	r	All malerial above project depth was characteristic of maintenance malerial. Did not encounter
	PJERS20-3-A	ţ	10/29/2020	14:15	884660	767071	ল	3,14	2'0	-30.7	6.3	37.0	6.2	33	hard day layer above project deput.
		44-44				-					3,9	-38.0	3,9	100	All material above project depth was characteristic of maintenance material. Old not encounter
Plers 1	PIERS20-3-B	ı	10/28/2020	14:45	384561	757695	ę,	34.9	9.8	34.1	3.9	-38.0	3,6	92	hard clay layer above project depth.
ihrough 4					1	-					*	-38.0	4.1	ន	An material above project depth was characteristic of mathlepance material. Did not encounter
	PIERS20-3-C	1	50729/2020	15:10	885026	758320	Ŗ	34.4	8,	-33.6	*	-38.0	57	93	hard clay layer above project depth,
											7.5	-34,7	5.0	7.0	
ļ	,										6.0	-33,6		63	Cores varied at this station with regards to penatration, 25 recoveries, and majorial encountered.
	NEWWOOD-S-A	NEWWOZD-5-	10/30/2020	8:45	884347	770917	e e	29.4	ŝ.	-27.6	5.0	32.6	42	z	Self (edigity day encountries et approx. Acto it includes to they suggest that they are the are they are the are they are the are the are they are the ar
											3.0	-30,6	2.0	159	
				$\downarrow$							53	37.0	67	25	All majecial above project depth was characteristic of maintenance material. Did not encounter
Dinte 14				40-44	37.788	777818	<del>8</del> 9	31.9	3	-30.5	7.5	38.0	5,7	3/2	hard clay layer above project depth but add have a destinct layer of Light gray sand at bottom of
through 14	NEWWOZO-5-B	Bollom	10/39/2020								7.2	-37.7	5,7	79	בפונים יש ליולים בשולים ליים ביים ליים ביים ביים ביים ביים ב
				-		-	ļ.,	-			8.2	-38.7	6.8	83	To a second seco
			401707070	14-36	884340	772580	ε <sub>γ</sub>	29.9	<u> </u>	-28.5	53	-35.0	23	80	As majernal above project deput has distance of instruction of the something haid, that day layer above project dapth, not sure what caused refusal but hit something haid,
	NEWWOZ0-5-C	t t	7870001								27.2	7.55.7	6.0	183	The first of the f
			POUGUETOF	42.55	884303	773240	గ్గ	38,5	1,3	37.2	1,	ì	1	_	Grab sample collected because <2 it of shorting.
San Juan	WEWWOXDS.			_8	-	╁	<b> </b>	\$		1	1	ŧ	1	1	Grab sample collected at effshore reference stabon.
Harbor	SJHJZO-REF	ı	10/29/2020	720	1	1	ì	ğ	I						- Indiana and the second and the sec
Vereiter	Coordinates we	Consider twee recorded in the field and were referenced to North American Datum of 19	d and were	eferenced	to North Am	rerican Datum	n of 1983, Ste	te Plane Co	oxdnate System	83, State Plane Coordinate System, Paerto Ricolvingri Islands (Zone 5200), US Survey Feet.	gin Islands (Zone	, 5200), US Sun	ey Feet.		
	Project depth po	Project depth provided is the proposed deepening depth.	ed deepenas	g depth.		1		S. Callering	(R) Volt rest, no	(17525749) Specifical and Section ID: 975577, Attachdes and currents has a govisation to the State of 15577).	5537 1. (https://ild	Lesandcurrents	es govistatic	mhome.hlmi?	Ma9755371}
;	Elevation data	Elevation data were collected in the field using the following NOAA active bee stable in American	Eest using Dr	a foBavéng	NOAA SEIG	re 000 1183/or	r semi spenii, r		3/10 (100)		,				
Notes	T = feet	t = feet RLW = Reap Loner LowWater													
	() = Not applicable	ž,													- Control of the Cont
	Sources: Alltena	and ANAMAR													

MPRSA Section 103 Sadimeni Characlenization, Puerto Rico Ports Authority Berthing Areas



TABLE 3
Results of Physical Analyses for Sediment Subsamples

Subsample ID:		Puerto Nuevo Harbor Plers A through D		30.	Puerto Nuevo Harbor Piers E through O	194 <sup>2</sup>		Plers 1 through 4	
Analyte	PRC20-1-A	PRC20-1-B	PRC20-1-C	PRC20-2-A	PRC20-2-B	PRC20-2-C	PIERS20-3-A	PIERS20-3-B	PIERS20-3-C
Sediment Description	Fat day, some sill, trace medium to fine-grained quartz send, gray	Fat clay with sand, some still, few medium to fine-grained quartz sand, tew coarse to fine sand-size shell tragments, trace fine gravel-size shell fragments, gray	Fat clay, some sill, few medium to fine-grained quartz sand, trace poarse to fine sand-size shell fragments, Irace fine gravel-size shell fragments, gray	Fat clay with sand, little sit, little medium to fine- grained quartz sand, little fine gravet- size rock fragments, few coarse to fine sand-size shell and rock fragments, gray	Fat clay, some slit, few medium to fine-grained quartz sand, trace coarse to line sand-size shell fragments, trace fine gravel-size shell fragments, gray	Fat clay with sand, little slit, few medium to fine- grained quartz sand, few fine gravel- size rock fragments, trace coarse to fine sand-size shell and rock fragments, gray	Fat clay, some silt, faw medium to fine-grained quartz sand, trace coarse to fine sand-size shell fragments, trace fine gravel-size shell fragments, gray	Fat day with sand, some silt, little medium to fine-grained quartz sand, trace medium to fine send-size shell fragments, gray	Fal day with sand, some slit, little medium to fine-grained quartz sand, trace coarse to fine sand-size shell tragments, gray
% Gravel	0.0	4.0	1.1	527	0.1	7,7	0,3	0,0	0.0
% Coarse Sand % Medium Sand	0.0	3.7 5.1	1.0	4,7 6.9	0.7	1 <u>.5</u> 3,4	1.0	1.1	1,3
% Fine Sand	1.8	7.3	3.8	4,3	8.9	6.1	6.1	18,0	13.4
% Sand (total)	1.9	16,1	6.0	15.9	11.1	11.0	7.4	19,1	15.1
% Silt	35.1	31.4	30.8	17.8	30,3	35,5 45.8	41.9	35.3	36.6
% Clay	63.0	48,5	62.1	53.6	58.5	45.8	50.4	45,6	48,3
% Silt & Clay (combined)	98.1	79.9	92,9	71.4	88,8	81.3	92.3	80.9	84.9
% Solids	37.1	47.0	39.8	63.7	47.2	46.6 CH	47.1	51.4	53.5
USCS Classification	CH	CH	CH	CH	CH	CH	CH	СН	CH
% Passing Metric Equivalent Sieve Size (mm)				Kirrey (L. Verrich					
1 inch 25.4 0.76 inch 19.1	100,0 100,0	100.0	100.0	100.0	100.D 100.0	100.0	100.0 100.0	100.0 100.0	100.0
0.375 inch  9.5	100.0	98.0	100,0	93.0	100.D	92.7	100.0	100.0	100,0
#4 4.75	100.0	96.0	98.9	B7.3	99.9	92.3	99,7	100.0	100.0
#10 2.00	100,0	92,3	97.7	B2.6	99.2	90.8	99.4	100.0	99.6
#10 2.00 #20 0.86 #40 0.425	100.0 99.9	89.8 87.2	97.1 96.7	78,9 75.7	98.6 97.7	89.1 87.4	98.9 98.4	98.9	98,3
#60 C.250	99.7	84.8	96.2	73,6	95.2	85,6	97.4	94.9	95.6
#60 C.250 #100 0.149	99,4	82,5	95,4	72.2	92.3	B3.7	95,4	85.7	89.9
#200 D.075	98.1	79.9	92,9	71.4	88.8	81.3	92.3	80.9	84.9
	97.9 @ 0.0267 mm	72.3 @ 0.0268 mm	89.0 @ 0,0264 mm	60.3 @ 0,0264 mm	86.8 @ 0,0261 mm	69.9 @ 0.0262 mm	81.8 @ 0.0267 mm	71.8 @ 0.0274 mm	73.2 @.0.0261 mm
	90.2 @ 0.0175 mm	71,5 @ 0.0170 mm	85,1 @ 0,0170 mm	59,0 @ 0.0169 mm	81,2 @ 0.0170 mm	65.9 @ 0.0174 mm	76.3 @ 0.0174 mm	65.8 @ 0.0179 mm	66.9 @ 0.0172 mm
Hydrometer Readings	82.5 @ 0.0104 mm	64.9 @ 0.0102 mm	77.3 @ 0.0102 mm	57.0 @ 0.00.99 mm	75.6@0.0101 mm	59.5 @ 0.0104 mm	67.1 @ 0.0105 mm	68.1 @ 0.0108 mm	59.0 @ 0.0104 mm
(% less than the following	71.5 @ 0.0077 mm	56.7 @ 0.0076 mm	69.4 @ 0.0075 mm	55.0 @ 0.0071 mm	70.8 @ 0.0074 mm	54.0 @ 0.0076 mm	59.7 @ 0.0077 mm	52.1 @ 0.0078 mm	54.3 @ 0.0076 mm
sizes)	84.9 @ 0.0056 mm	50,1 @ 0.0055 mm	63.6 @ 0.0054 mm	53.7 @ 0.0051 mm	60.7 @ 0.0054 rnm	47.6 @ 0.0056 mm	52,4 @ 0.0056 mm	47.0 @ 0.0057 mm	49.6 @ 0.0055 mm
	52.8 @ 0.0029 mm	41.9 @ 0.0028 mm	51.8 @ 0.0028 mm	45.7 @ 0.0026 mm	51,4 @ 0,0028 mm	38.9 @ 0,0028 mm	45.0 @ 0.0028 mm	41.9 @ 0.0028 mm	41.7 @ 0.0028 mm
	40.7 @ 0.0012 mm	32.1 @ 0.0012 mm	40.1 @ 0.0012 mm	36.5 @ 0.0012 mm	40.1 @ 0.0012 mm	27.8 @ 0.0012 mm	35,8 @ 0.0012 mm	33.3 @ 0,0012 mm	32.3 @ 0,0012 mm



TABLE 4 Results of Physical Analyses for Composited Sediment Samples

	San Juan Harbor	Puerto Nuevo Harbor	Puerto Nuevo Harbor	Piers 1 through 4	Piers 11 t	hrough 14
Sample ID:	Reference SJH20-REF	Piers A through D PRC20-1-Comp	Piers E through O PRC20-2-Comp	PIERS20-3-Comp	NEWWO20-5-Comp	NEWWO20-5-Clav-Comp
Analyte	postgravnip SJMZU-REF(Whiphosters				The state of the s	
Sediment Description	Fat clay, some sit, few medium to fine-grained quartz sand, trace coarse to fine sand-sized shell fragments, gray	Fat clay, some silt, few medium to fine-grained quartz sand, trace coarse to fine sand-size shelt fragments, trace fine gravel-size shell fragments, gray	Fat clay, some slit, tittle medium to fine-grained quartz sand, trace coarse to fine sand-size shell fragments, trace fine gravel-size shell fragments, gray	Fat clay, some sill, fav medium to fine-grained quartz sand, trace coarse to fine sand-size shell fragments, trace fine gravel-size shell fragments, gray	Sandy fat clay, some medium to fine grained quartz sand, little sit, few coarse to fine sand-size shell fragments, trace fine gravet-size shell fragments, gray	Sandy fat clay, some medium to fine- grained quartz sand, few silt, trace coarse to fine sand-size shell fragments, gray brown
% Gravel	0.0	0,5	0.9	1.1	1.4	0,0
% Coarse Sand	0.1	1.4	2.6	0.5 1.3	3.3	0.7
% Medium Sand	0.1 0.5	2.7	4.4	1,3	3.3	15,7
% Fine Sand	9.3	7.4	5.5	10.6	26.5	15.7 24.7
% Sand (total)	9.8	11.5	12.5	12,4	40,4	41.1
% Silt	45.6	39.7	29.1	36.1	26,0	7,8
% Clay	44.5	48.3	57.5	50,4	32,2	51_1
% Silt & Clay (combined)	90.1	88.0	86,6	86,5	58,2	58,9
Specific Gravity	2.720	2.686	2.648	2,659	2,708	-
% Solids	55.4	42.7	53.1	49,9	83,5	76.1
Bulk Density (pcf)	51.8	53.0	48.6	45.9	52.0 CH	
USCS Classification	CH	CH	CH	CH		CH
PL	25	38 195	. 34	28 81	22	
Atterberg Limits LL	59		94			
Pi	34	67	60	53	50 -	
% Passing Metric Equivalent Sieve Size (mm)						
1 inch 25.4 0.75 inch 19.1 0.375 inch 9.5	100.0 100.0 100.0	100.0 100.0 100.0	100,0 100,0 99,7	100.0 100.0 99.6	100,0 100,0 100,0	100.0 100.0 100.0
#4 4.75 #10 2.00	100,0	99.5 98.1	99.1 98.5	98.9	98.6 95.3	99,3
#20 0.85	99.8	97.0	94.3	0.89	91.9	96,6
#40 0.425			92.1			
#40 0.425 #60 0.250	99.4 98.7	95,4 93,0	89.9	97.1 95.0	84.7	83,6 70,8
#100 0.149	97.4	90.7	88.2	90.8	63.0	62.1
#200 0.075	90.1	88.0	86.6	85.5	58.2	58.9
1444.4	70,2 @ 0.0279 mm	80.7 @ 0.0266 mm	73,4 @ 0.0246 mm	75.4 @ 0.0257 mm	51.4 @ 0.0281 mm	55.1 @ 0,0303 mm
	60,8 @ 0.0184 mm	77.0 @ 0.0172 mm	70.5 @ 0.0160 mm	69.8 @ 0.0169 mm	48.7 @ 0.0181 mm	54,2 @ 0,0195 mm
1	53.2 @ 0.0110 mm	67.7 @ 0.0104 mm	66.2 @ 0.0095 mm	61.9 @ 0.0103 mm	42.5 @ 0.0108 mm	54.2 @ 0.0111 mm
Hydrometer Readings	49,5 @ 0.0079 mm	60.3 @ 0.0076 mm	62.0 @ 0.0070 mm	56.3 @ 0.0075 mm	37.7 @ 0.0079 mm	53,3 @ 0,0079 mm
(% less than the following sizes)	45.7 @ 0.0056 mm	51.0 @ 0.0056 mm	57.7 @ 0.0051 mm	51.6 @ 0.0054 mm	33.6 @ 0.0057 mm	51.5 @ 0.0056 mm
	40.0 @ 0.0028 mm	41.7 @ 0,0029 mm	47.7 @ 0.0026 mm	42,1 @ 0,0028 mm	28,1 @ 0,0029 mm	49.7 @ 0.0028 mm
1	32.5 @ 0.0012 mm	32.5 @ 0,0012 mm	36,3 @ 0,0012 mm	34,1 @ 0.0012 mm	24.0 @ 0.0012 mm	44.3 @ 0.0012 mm

See Appendix C for grain size distribution graphs and laboratory triplicate results, Grain sizes and soil classifications are defined at the front of the tables section.

Source: Terracon Compiled by: ANAMAR Environmental Consulting, Inc.



TABLE & Analytical Results for Dry Weight Metals in Sediment Samples

Anavirum         TEL         ERLI ERLI ERLI ERLI ERLI ERLI ERLI ERLI	MDL MRL 0.04 0.36 0.22 0.86	Result Garden 16.2 - 16.2 - 2.3 - 2.	MDI: 0.05	0.24 0.24 1.20	Resulf: mg/kg 16.5 0.12	1 Gualifier									<b>新城</b>
mg/kg mg/kg mg/kg gg MDL   22.1 7.24 8.2 13.6 - 0.04   0.46 0.676 1.2 ND U 0.05   1.	MDL MRL 0.04 0.35 0.05 0.47 0.22 0.86	6/4	<b>ĕ</b> .[	0.48 0.24 1.20	÷ 1			9 È	Result	Milau( Ž	Ž.	Result	aillisu	MDL	MR.
m 0.46 0.676 1.2 ND U 57.9 52.3 81 46.4 – 109 18.7 34 63.8 – 78.8 30.24 46.7 16.3 – 60.658 0.13 0.15 0.116 –	•			0.24	62.2			<u> </u>	4 L	1		16.4	-	0.05	0.50
57.9 52.3 81 46.4 – 109 18.7 34 63.8 – 78.8 30.24 46.7 16.3 – 0.658 0.13 0.15 0.116 –				1,20	52.2	J.	a 60.0	0.29 0	0.36	0.06	0.20	0.15	· ••	20.0	0,25
76.58 0.13 0.15 0.116				•	•	0	0.37 1.	7.44	. 67.3	- 0,26	3 1.02	52.0	ı	0.32	1.25
78.8 30.24 46.7 16.3 – 6.658 0.13 0.15 0.116 –	0.59 0.86	84.1	0.82	1,20	84.3	ci 1	0.98 1.	1.44	109	0.69	3 1.02	85.5	t	0.85	1.25
IIV 0.558 0.13 0.15 0.116		33.4	. 0.16	0.24	32.2	ı	0.20 0.	0.29	49.5	- 0.14	4 0.20	30.2	1	0.17	0,25
200	_		- 0.0121	0.0576	0.374	ı	0.0137 0.0	0.0652 0	0,554	88600'0	188 0.0470	0,333	,	0,00975	0.0464
Name 15.9 20.9 29.3 - 0.09		27.8	- 0.12	1.20	25.5	ı	0.14 1.	1.44	37,9	- 0.10	1.02	25.6	ι.	0.12	1.25
0.73	0.03 0.35	1.13	0.04	0.48	0.80	ı	0,05		1.85	0.03	3 0.41	0.83	1 :	0.04	0.50
186 124 150	1.4 6.9	164	2.0	9.6	146	. ''	2.7	11.5	165	1.9	9.4	149	ı	2.3	10.0



TABLE 6 (continued)
Analytical Results for Dry Weight Metals in Sediment Samples

	Pil	RS20	0-3-Com	p		PIER	520-3-A			PIER!	S20-3-B			PIERS	S20-3-C		NEV	NWO	20-5-Con	np	NEWV	O20	-5-Clay-C	omp
Analyte	Result mg/kg	Qualifier	MDC	MRL	Result mg/kg	Qualifier	MOL	MRL	Result mg/kg	Qualifier	MDL	MRL	Result mg/kg	Qualifier	MDL	MRL	Result mg/kg	Qualifler	MDL	MRL	Result mg/kg	Qualifier	MDL	MRL
Arsenic	13.0	-	0.04	D,38	14.8	-	0.04	0.40	12,7	_	0.04	0.39	14.2	-	0.04	0.36	9,53	-	0.04	0.38	22.1		0.03	0.24
Cadmium	0,09	J.	9.06	. 0.19	0.15	J	80.0	0.20	0.10	J	0,06	0.19	0.06	J	0.05	0,18	0,22		0.06	0.19	0,04	J	0.04	0.12
Chromium	42.5	-	0.24	0,94	45,0		0.28	1.00	38,5	-	0,25	0.97	42.7	-	0.24	0.91	31.8	-	0.25	0,95	30.4	-	0.32	1.22
Copper	61.7	-	0.64	0.94	82.5		89,0	1.00	64.6		0,66	0.97	54.6	~	0,62	0,91	71.3		0.65	0.95	33.6	~	0.42	0.61
Lead	29.2	•••	0.13	0.19	78.8		0.14	0,20	28,4		0.13	0.19	22.1	-	0.12	0.18	75.5	-	0.13	0.19	6.81		0.08	0.12
Mercury	0,283	***	0.00984	0.0469	0.558		0.0111	0.0528	0.296		0,0105	0.0499	0,263	-	0.0084	0.0400	G,4B4	-	0.00875	0.0417	0.0463	-	0.00575	0.0274
Nickel	19.2		0.09	0.94	20,8		0.10	1.00	17.4		0.10	0.97	19,9	-	0.09	0.91	14.6		90.09	0.95	13.5	-	0.08	0.61
Silver	0.66	-	0.03	0.38	1.31		0.03	0.40	0.65	-	0.03	0.39	0.37		0.03	0.36	1.67		0.03	0.38	0.03	J	0,02	D.24
Zinc	113		1.5	7.5	156		1.9	8.0	105	_	1.8	7.8	90.9	-	1.5	7.3	167		1.8	7.6	35.0	-	1.0	4.9

Bolded values exceed the TEL and (or) ERL.

Non-detect (ND) = The analyte was not detected at or above the MOL.

Acronyms and qualifiers are defined at the front of the tables section.

Sources: Results from Analytical Resources, Inc.; TEL and ERL values from Buchman (2008).



9,5 1,00 1.00 97 97 97 9: 9 00,1 8 1.00 00 0.17 0.37 PRC20-2-C Result 문 2 2 õ 2 운 õ : 9 8 : 9 8 8 1,00 <del>5</del>. 1,00 2.00 90, 0.19 5. 0.07 0.31 0.17 0,23 PRC20-2-B Qualifier Result pg/kg 皇 옔 2 2 皇 ç 9 2 2 2 8. 8 8, ő 8 8. 0.12 0.05 0.17 9.07 0.31 Qualifier 2 2 9 읽 2 2 문 1,00 1,60 1.00 8 90: 1.00 8 1.00 1.00 8 8 5 MR MDI 0.25 TABLE 7 (continued) Analytical Results for Dry Weight Pesticides in Sediment Samples 0.19 0.32 55 0.19 0.32 0.11 0,07 631 0.12 0,05 0.11 0.23 0.37 qualifier Result 오 Heptachlor Epoxide Endosulfan Sulfate a (cis)-Chlordane trans-Nonachlor o,p' (2,4')-DDE p,p' (4,4')-DDE o,p' (2,4')-DDT o,p' (2,4')-DDD p,p' (4,4')-DDD p,p' (4,4')-DDT Endosulfan II Endosulfan ( Heptachlor Dieldrin Analyte Aldrin



Control and Contro	Carrier Source	STATE OF THE PARTY OF	September 1	Name of the last			· · · · · · · · · · · · · · · · · · ·	1				PRC20-1-A	4-1-		۵.	PRC20-1-B	<b>P</b>		PR	PRC20-1-C	
		San	Sample ID:		S.HZO-NET			7		1		New Age	100000000000000000000000000000000000000	100 miles	SERVICE SERVICE	CHECKEN ST	経典が	無機の			
	Maximum Conc.	TEL	ERL	Result	ialifier		Result	ាទពីរនៃប			Result	naillier		ш - 0 2	Result un/ko	agilier S	MDL MRL	ongstra. Abro Orostalia	Result 197kg Qualiffer	MDL	LMRL
	ua/kg	11g/kg	µg/kg	pglkg	ר סו	MDL MRL	+	à l	MIDE	: [	Fushi			4-		1		┯	88	0	
uldry terror LAW	27.5	6.71	16	1.61	0	0,57 100	0.68	7	0.57	99.8	0.68	-	0.57	8,68	2,48	อ๋ -				3 ! 5	
Acenaphinene		. A 87	44	3.60	; ¬	1,08 100	2.76	7	1.08	99.8	2,98	٠,	1.08	93.8	7.29	<del>-</del>	1.08	99.7	6,52	7.	
Acenaphthylene	ora i		. 10	27.8	-	0.87 100	4.56	~	0.87	99.8	2.53	<b>¬</b>		8.66	9.91	ر ان		7 7.66	7.28	0.87	:
Anthracene	94.	A.O.	. : :						5	. o	9.78	-	0.82	99.8	31,6	0	0.82 99	99.7	23.6	1 0.82	2 99.8
Benzo(a)anthracene knw	156	74.8	<del>8</del>	15.8	~	•		7	70.0	1	}			000	27.72	<u>_</u>		2 2	7.2	0.61	1 99.8
Benzo(a)byrene	186	88.8	430	17.8	о. О.	0,61 100	13.8	つ	0.61	8.66 6	44	-,		0 1		. : -		<u>:</u> -		137	
Benzo(h)fluoranthene	201	: *	×	12.2	-,		15.7	->	1,37	89.8	Ξ	<u>-</u>		88.8	41.5	, . ,					
Repzola h ilnerviene	38.4	×	×	22.5	o o	1.06 100	3.85	. 6	1.06	8.69.	11.7	٠	£, 8	8.08 8.08	12.4	ب	•	<u>.</u>		2	860 94.0
HAM		: :	. >	733	. 7	0.76 100	6.48	***	0,76	99.8	6.54	7	92.0	98.8	27.0	-	0.76	7.88	7.4		
Benzo(k)fluoranthene	= ;	٠ ;	; ;	4	-	1.05	14.7		1.05	8.66	12.4	ټ.	1.05	98.8	36,0	<u>ب</u>	1,05 9	99.7	32.6		1.05 99.8
Chrysene	161	108	4 4 5 7 7 7	0.01	,				8		. 2	ລ	. 68.0	. 868	8.64	٠	6 68.0	99.7	7.48	J. O.	0.89 99.8
Dibenzo(a,h)anthracene	48.5	. 6.22	53.4	3,61	73						Ş	-	0.47	8 60	55.4	~	0,47 9		6.0	Ċ.	0.47 99.8
Fluoranthene	329	113	900	21.5	7	0.47 100	-	<b>7</b>	7	5	3 : 3	٠, ١		: 0				7 66	2.74	' d	8.62 59.8
Fliorene	14.5	21.2	19	2,76	<b>¬</b>	0,63 100	0.98	··	0.63		7.14	7	200	3		, -			. 0	_	200
ndeno(4 9 3_cd)murenpHiM	142	×	ж	13.7	۳,	1.05 100	0 11.1	7	1.05	8.68	9.23	~ .	1.05	8 : 8 :	30.8	ت	a		100		3   5
maria (article article		26	180	4.75	י	1.27 100	Q Q	<b>-</b>	1.27	93.8	2	⊃	1.27	8.8	3.78	~,			o o	,	
Naphthalene	3 :	} ;		14	_	070 400	630	7	0.72	99.8	5.02	,	0.72	99.B	14.5	~	0.72	99.7	13.3	e .	0.72 99.8
Phenanthrene	46.8		240	<u>;</u>		:	<del></del> -		63.0	8	. 5		. 29.0	868	62.6	,			30.B	.0	53 99.8
Pyrene	267	153	665	28.1	r.	001 590	-		700	ľ				T	0 27	ŀ	1		402		). i
Total I MAN DALIS	205	312	552	31.9			16.5	מע			14.6			<u></u> -	P.					•	
Sign Fill Mark College	16.50	. 7.7.	1700	159			146				96				332				213		
Total HMW PAHS	2501	}	}	-											377				252		•.•



TABLE 8 (continued) Analytical Results for Dry Weight PAHs in Sediment Samples

J 0.87 1 1.08 1	and Section and an artist and an artist and artist ar	Section Section (Section Control	Contractor	Shirt Navada	handing a	珍田林俊	CONTRACT.	<b>新加州的</b>	経験組	政治统治	Mar Tracks	<b>高級監督</b>		1	•		2	ARRIV.	MENANTO E Comp		NEM	VO 20	NEWNOZD-5-Clay-Comp	Como
Result   Fig.		PIERS	20-5-C	duio		国品	352D-3-		<b>新加坡</b>	PE	3520-3-E		X 20 X 3	T T T T	270-2-1		2	703406			ALCO MULTINATION			100 miles
Result   R		19 11				12.00				300 Sept.			Resul	10000			Result	alifier			Result	Teififiet		
HINNY 82.8 J 0.657 99.8 14.5 J 0.657 99.9 14.8 J 0.657 99.9 14.8 J 0.657 99.9 14.8 J 0.657 99.9 14.8 J 0.87 99.9 14.8 J 0.82 99.8 23.0 J 0.87 99.9 14.4 J 0.85 99.9 23.0 J 0.87 99.9 14.4 J 0.85 99.9 23.0 J 0.87 99.9 14.4 J 0.87 99.9 23.0 J 0.87 99.9 14.4 J 0.87 99.9 23.0 J 0.87 99.9 14.4 J 0.87 99.9 14.8 J 0.87 99.9 14.4 J 0.89 99.9 14.4 J 0.87					11,5353		N	MRL	-/		TOW	MRL	rg/kg	000	MDL	MRL	µg/kg	סח	ZD.	MRL	ug/kg	סי	NO.	E E
HINNY 82.8 J 1.08 99.8 54.3 J 1.08 99.9 11.9 J 0.87 99.9 11.9 J 0.89 99.9 J 0.89	(				1	: 1	0.57	6,68	╁┈	7	0.57	89.8	S	⊃	0.57	7.66	2.62	<b>ب</b>	0.57	8.66	2	<b>=</b>	0.57	8
HINN 82.8 J 0.87 99.8 54.3 J 0.87 99.9 11.8 J 0.82 99.9 23.0 J 0.82 99.9 11.8 J 0.82 99.9 23.0 J 0.82 99.9 11.8 J 0.81 92.9 11.8 J 0.82 92.9 11.8 J 0.82 92.9 12.8 J 0.82 92.9 J 0.	Acenaphthene	2 6	2 4		<u></u>		1,08	- 66	10.8	. ¬	1,08	6'68	9,92	3	1.08	99.7	11.0	7	1,08	99.6	1.46	7	1.08	100
Cene Halvy Sa. J 0.82 99.8 186 - 0.62 99.9 28.1 J 0.62 99.9 23.0 J 0.62 99.9 14.1 J 0.61 99.8 186 - 0.65 99.9 44.1 J 0.61 99.8 186 - 0.65 99.9 44.1 J 0.61 99.9 50.7 J 1.37 14hene Halvy 120 - 1.37 99.8 201 - 1.37 99.9 44.1 J 1.06 99.9 50.9 18.7 J 1.06 99.9 50.7 J 1.37 14hene Halvy 24.3 J 1.06 99.8 184 J 1.06 99.9 18.7 J 1.06 99.9 50.7 14.8 J 1.06 99.9 18.7 J 1.06 99.9 14.7 J 1.06 99.9 14.7 J 1.06 99.9 14.5 J 1.06 99.9 14.5 J 1.05 99.9 14.2 J 1.0	Acenaphthylene	0.07	2 6			,	787	666		3	0.87	99.9	11.3	7	0.87	59.7	14.3	7	0.87	89.8	1.37	٦.	0.87	100
120	Anthracene	27.5	70'0	÷	<u>-</u> i-		0.82	6.66		• •	0.82	99.9	23.0	· ¬>	0.82	99.7	413	; 	0.82	99,8	5.73	_ <u>_</u> ,	0.82	100
THAN 120 — 1.37 99.8 201 — 1.37 99.9 44.0 J 1.37 99.9 50.7 J 1.37 PHAN 120 — 1.37 99.8 201 — 1.37 99.9 44.0 J 1.37 99.9 50.7 J 1.06 PHAN 24.3 J 1.06 99.8 38.4 J 1.06 99.9 12.6 J 0.76 99.9 26.5 J 0.76 PHAN 26.1 J 0.88 99.8 16.7 J 1.05 99.9 26.5 J 0.76 PHAN 26.1 J 0.88 99.8 16.1 J 1.05 99.9 26.5 J 0.76 PHAN 26.1 J 0.88 99.8 16.1 J 1.05 99.9 26.5 J 0.76 PHAN 26.1 J 0.88 99.9 13.5 J 0.68 99.8 14.5 J 0.68 99.9 14.5	Benzo(a)anthracene	82,8	70 70				5	6		7	0.61	99,8	44.2	ຠ	0.61	39.7	54.8	~	0.61	9.9.B	9.83	د	0.61	100
120	Benzo(a)pyrene	104 	9 :				5 6	•			137	6.66	50.7	7	1.37		93.8	·,	1,37	99.8	11.0	٠	1.37	100
24,3         1         106         98.8         38.4         1         100         35.2         10.7         99.9         21.6         1         0.76         99.9         21.6         1         0.76         99.9         26.5         1         105         99.9         26.7         1         105         99.9         26.7         1         105         99.9         26.7         1         105         99.9         26.7         1         105         99.9         26.7         1         105         99.9         16.8         1	Benzo(b)fluoranthene	120								,	Š	6 66	13.8	7	1,08	99.7	16.4	7	1.06	8.68	4.70	ה	1.07	100
anthene Hanvi 60.8 J 0.76 99.8 1111 — U.70 59.9 33.3 J 1.05 99.2 25.7 J 1.05 90.0 nthracene Hanvi 26.1 J 0.88 99.8 161 — 1.05 99.9 13.3 J 1.05 99.9 16.8 J 0.89 other series of the seri	Benzo(g,h,l)perylene	24.3	<u>.</u>	£	<u>:</u>	<b>7</b>	0.0	_	·	, -	97.0	000	28.5	. ¬	0.76	99.7	47.7	:	0.76	99.8	5,82	. ¬	0.76	100
HINY  16.6 J 1.05 99.8 161 - 1.05 99.9 10.8 99.9 10.8 99.9 10.89  18.7 J 0.88 99.8 48.5 J 0.88 99.9 10.89 99.9 10.88 99.9 16.8 J 0.89  18.8 J 0.63 99.8 14.5 J 0.63 99.9 42.7 J 1.05 99.9 10.83 99.9 10.83  18.9 J 1.05 99.8 14.2 - 1.05 99.9 42.7 J 1.05 99.9 94.0 J 0.63  18.9 Juny  22.4 J 0.72 99.8 46.8 J 0.72 99.9 18.9 J 0.72 99.9 94.0 J 0.72  18.6 J 0.63 99.8 267 - 0.63 99.9 18.9 J 0.72 99.9 94.0 J 0.72  18.9 Juny  44.5 J 1.27 99.8 267 - 0.63 99.9 18.9 J 0.72 99.9 94.0 J 0.72  18.6 J 0.72 99.9 94.0 J 0.72  18.6 J 0.72 99.9 94.7 J 0.65  18.6 J 0.72 99.9 94.0 J 0.72  18.6 J	Benzo(k)fluoranthene <sup>Hmm</sup>	60.8 J	0.7				e '			· ·	30	0	26.7		1.05	599.7	59.0	~	1,05	8,66	7.99	7	1.05	100
Inthracene Haw 26.1 J 0.88 99.8 48.5 J 0.89 98.9 13.5 J 0.89 98.9 13.5 J 0.89 98.9 14.5 J 0.89 98.9 14.5 J 0.89 98.9 14.5 J 0.83 99.9 2.30 J 0.83 99.9 2.30 J 0.83 99.8 14.5 J 0.63 99.9 42.7 J 1.05 99.9 3.81 J 1.05 99.9 14.5 J 1.27 99.8 4.27 J 1.05 99.9 94.0 J 1.05 99.8 4.27 J 0.63 99.9 94.0 J 0.72 99.8 4.27 J 0.63 99.9 94.0 J 0.72 99.8 4.27 J 0.63 99.9 94.0 J 0.72 99.8 4.41 J 0.65 99.9 94.0 J 0.72 99.8 4.41 J 0.72 99.9 94.0 J 0.72 99.9 94.1 J 0.63 99.9 94.0 J 0.72 99.9 94.1 J 0.63 94.0 J 0.72 99.9 94.1 J 0.63 94.1	Chrysene Haw	86.0	ő.				3,05				2 6			, -	. 6	7 00	17.7	~	0.89	866	2.99	7	. 68.0	100
465         0.47         99.8         329         0.47         69.3         46.4         J         0.47         98.9         23.7         J         0.47         98.9         23.7         J         0.43         J         0.47         98.9         23.0         J         0.63         99.8         1.45         J         0.63         99.9         1.05         99.9         2.30         J         0.63         99.8         2.21         J         1.05         99.9         44.1         J         1.05           14.5         J         1.27         99.8         4.21         J         1.27         99.9         4.21         J         1.27         99.9         1.27         99.9         1.27         99.9         9.40         J         0.72           156         -         0.62         99.8         267         -         0.63         99.9         1.27         J         0.63         99.9         24.1         J         0.62           111         205         -         0.63         99.9         42.7         J         0.63         99.8         24.1         J         0.62           904         1640         -         0.63         99.9	Dibenzo(a,h)anthracene	26.1	0.8			ۍ د	0,89			מי	0,83	F 1	2 4		Gard C	i i		, -	27.	o o	9.43	7	0.47	100
yyene         Hann         78.9         J         0.653         99.8         14.5         J         0.653         99.9         L         1.05         99.8         14.5         J         1.05         99.9         44.1         J         1.05         39.9         J         1.05         99.9         44.1         J         1.05         99.9         44.1         J         1.05         99.9         42.7         J         1.27         99.9         4.21         J         1.27         99.9         9.40         J         0.72         99.9 <td>Finoranthene</td> <td>165</td> <td>0.4</td> <td></td> <td></td> <td>ga ga</td> <td>0.47</td> <td></td> <td></td> <td>~~;</td> <td>0.47</td> <td>6.66</td> <td>). </td> <td>~</td> <td>74.0</td> <td>7.6</td> <td>6</td> <td>• : •</td> <td></td> <td>3</td> <td>3</td> <td>· ;</td> <td>1 8</td> <td>. 5</td>	Finoranthene	165	0.4			ga ga	0.47			~~;	0.47	6.66	). 	~	74.0	7.6	6	• : •		3	3	· ;	1 8	. 5
collopyrene Hinv         78.9         J         1.05         99.8         42.1         J         1.05         99.9         42.1         J         1.05         99.9         44.1         J         1.05           Luv         14.5         J         1.27         99.8         4.21         J         1.27         99.9         3.81         J         1.27           Luv         22.4         J         0.72         99.8         46.8         J         0.72         99.9         1.87         J         0.72         99.9         9.40         J         0.72           AHs         111         205         205         51.3         37.3         37.3         292           AHs         111         1640         1660         383         292         292	The state of the s		. 0	:	<u>:                                    </u>	, ru	0.63			2	0.63		2.30	~	0.63	39.7	3.60	-,	0,63	8 66 8	2	<b>-</b>	0.63	<u>₹</u>
-colpyrene (4.5 J 1.27 99.8 21.3 J 1.27 99.9 4.21 J 1.27 99.9 3.81 J 1.27 91.27 91.2 J 1.27 91.2 J 1.2	riudiene 	0 87	5			ા	1.05				1,05		44.1	J.	1.05	7.86	55,2	<b>-</b> 3 :	1.05	89.8	9,13	i د	1.05	6
neuw         22.4         J         0.72         99.9         18.9         J         0.72         99.9         J         0.72         99.9         J         0.72         99.9         J         0.72         99.9         J         0.72         J         0.62         J         0.72         J         0.62         J         J         0.62         J         0.72         J         0.62         J         J         0.62         J         J         0.62         J         J         J         0.62         J         J         J         D         C         D         C         D         D         D         D         C         D         <	Indeno(1,2,3-cd)pyrene	2 : 1		;			127		<u>.                                    </u>		1.27		3.81	· •••	1.27	28.7	5.10	~	1,27	8'68	웆	<b>5</b>	1.28	001
AHS 111 205 904 1640 333 222 292 24.1 J 0.62 292 24.1 J 0.62 24.1	Naphthalene	j .					07.0			-	0.72			~	0.72	99.7	26.7	~	0.72	8,66	3,64	~	0,72	6
AAHS 111 205 54.3 57.3 57.3 5AHS 904 1640 353 55.9 592	Phenanthrene	22.4	, i	•		9 1	3   6	,			690		<u>:</u> .		. 0.62	7.96	. 83.4		. 29'0	8.66	938	3	0,83	8
111 205 51,3 504 1640 353	Pyrene	156	9.6		4	<u>'</u>	6.0		+			ļ: <i>'</i>	+				83		Lung.	ľ	8.95	:		
904 1640 353	Total LMW PAHs	111			⊼ ;	×			ις 	n		٠٠.	3	'n			1				78.0			•
	Total HMW PAHs	904			16	40			<u>ج</u>	ຕ.			587	01							2 6			
1845 384 329	The state of the s	1015				ī.			38	-4*		•	325	æ			588				8			

LMW Low molecular weight PAHs (EPA Region 2 Guidance Manual, 2016).

HMW High molecular weight PAHs (EPA Region 2 Guidance Manual, 2018).

Bolded values exceed the TEL and (or) ERL.

For calculating total PAHs, U-qualifled results use the MDL and J-qualifled results use the value reported by the laboratory.

Acronyms and qualifiers are defined at the front of the tables section.

Sources: Results from Analytical Resources, inc.; TEL and ERL values from Buchman (2008). Compiled by: ANAMAR Environmental Consulting, Inc.



TABLE 9 (continued)
Analytical Results for Dry Weight PCBs in Sediment Samples

	A Company of the Comp	The state of the s	See Section 100 To	A machiner		DDC-30.9 A	2.4	A SECTION		PRC20-2-B	2.8			PRC20-2-0	0.2-C	
		PRC20-2-Comp	Comp			FRUEN	47	1			ALM MARKET STATE	Section of the second	SERVICE CONTRACTOR	State State Man	<b>建筑建筑建</b>	ないなどの
		10				191				jijet.				ទេវិវិវិ		
	Result	ìile			Result	en	7		Result	ង្រាវ	C Z	MRL	ugika	gne	MDL	Z.7.
Analytic	ugika	ηŋ	MDE	MRL	pg/kg	0	MUL	IMINE	- Fußd	: בּ	1000	60.4	Q.	1.	1.00	2.00
1000 Tio	GN	Ď	66.0	1.98	Ð	⊃	0.98	1.97	Q N	<b>5</b> .	68.0	6	2	)		
P(E-5/0	1	- =	000	980	Q	ב	0.98	0.98	Q.	<b>&gt;</b>	0.99	66'0	<u>a</u> 2	= .	00.1	001
PCB-18	2	) )		3 8	: 2	;=	0.98		. 2	: ,,	0.98	0.99	Q	<b>=</b>	8.	1.00
CB-28	S.	: >		B	<u>.</u>	) :		800	2		0.99	66.0	ΩN CN		1,00	4,00 6,1
PCB-44	S	⊃	96.0	0,98	Q Q	<b>&gt;</b>	0,98	ce.	<u>.</u>	>			i i	1	5	100
	2	=	0.09	0.99	S	⊃	0.98	0.98	1.49	,	88.0	88 ·	3	١.	2 .	
2-17	9	: =	000	. O	Q2	<b>-</b>	96'0	0.98	ON	<b>-</b>	68'0	0.38	1.85	1	J.U.	20.
CB-52	2	<b>.</b> :		9	2	=	0.98	0.98	ND	⇒	0.99	0.89	<u>Q</u>	ع :	8	8
2CB-66	2 2	· ɔ	, 1877 :	200	<u>9</u> . <u>9</u>	) , E	80.0		2	∶⊃	66'0	0.99	ð	⊋	50.	1.00
PCB-87	2	<b>=</b> ;	66.0	86.0	2	: כ	2	8	6	. 1	900	- 06	2.96	1	1.00	1.00
PCB-104	1.60	1	0.99	0.99	2	: =>	86.0	26.0	, ,	1			9	; :=	. 60	2
100	- C2	: :=	66.0	0.89	22	≐	0.98	0.98	2		78. C	S .	2		2	
-10B-405	<u></u>		900	000	2	Э	98'0	0.98	1.71	ı	66'0	65.0	1.82	ŀ	50.	3.5
PCB-118	2	<b>)</b>	2		<u> </u>	=	0.58	0.98	QN.	⊃	66.0	66.0	QN	<b>-</b>	1.00	1,00
PCB-128	2	<b>=</b>	58.0	£8.0	2 3	)	800	88	5.94	:	0.99	0.39	6.13	ı	1.00	1.00
PCB-138	3.40	ı	0.93	66.0		ì	8	: 6	 	-	. 60 C	000	11.0	. 1	1.00	1.00
000	6.16	1	66'0	66'0	1.85	1	86.0	ອຄາ	o :	I	} : :			:		. 6
20102		:	. 500	66.0	2	<b>.</b>	98.0	0.98	2.41	ł	0.99	56.0	2.41	}	 1	5:
PCB-170	?	ı		6	ě	Ξ	0.98	95'0	5.16	1	0.39	66'0	5.17	ł	1.00	8
PCB-180	2.96	i	66.43	n :	2 :	. :	000	go	1.46	ī	0,99	66.0	1.52	i	1.00	1.00
PCB-183	2	⊃ :	66.0	0,99	2	<b>5</b> :	00.0	3 : 8	<u> </u>	-	. a	. 66 0	. c	: , => :	: 8.	00.
DCB-484	2	∍	66'0	0.99	2.	s	86.0	26.0	₹	)	3 : 1			:	. 5	. 6
		;	0.99	0.89	ON ON	⊃	0.98	0.98	3.96	i ;	0.39	88.0	4.00	:	3	
PCB48/	2	:		; e		` == :	0.98	0.98	Q	⊃	66'0	0.99	2	⇒ .	8	8
PCB-195	Q Z	<b>ɔ</b> :	n (	n . 0	<u> </u>	. =	860	0.98	2	. =	0.99	0.38	Q.	ח	1.00	90.
PCB-206	2	) 	66.0	as co	ğ : ç	. =	0.38	0.98	9	; ; <b>=</b>	0.80	0.99	2	n	1,90	1.00
PCB-203	2	ا د	880	9670					48.3		·   •	-	50.6		:	
Total EPA Region 2 PCBs	33.8		:		277											



Analytical Results for Metals in Site Water and Elutriates Generated from Sediment TABLE 10

		Š	U	E .	S HPA-REF-SW			PRP.	PRPA-SW		NEI	MMOX	NEWWO20-5-Comp	۵
	Sall Maximum Conc.	Sample ID.	Result	gualifier	ION	MRI	Result	19)][[su@	MDL	MRL	Result µg/L	19iTilsu <b>O</b>	MDL	MRL
Analyte Arsenic	2.93	69	1.15	1	90.0	0.50	0.89	1	90.0	0.50	2.93	1	90.0	0.50
Cadmium	0.062	. 40	0.006	· · ¬	0.003	0.020	0.062	· .	0.003	0.020	0.007	¬	0.003	0,020
Chromium	0.20	1100	0.18	. <b>-</b>	0.02	0.20	0.20	1	0.02	0.20	0.10	~	0.02	0.20
Copper	1.13	4.8	1.13	ŀ	0.02	0.10	0.36	I	0.02	0,10	0.64	ì	0.02	0.10
Lead	0.191	210	0.050	ļ	0.020	0,050	0.114	1	0.020	0.050	0.191	ļ	0.020	0.050
Mercury	Q N	4.8	Q	· ⊃	0.02	0.20	ON	כ	0.02	0.20	S	)	0.02	0.20
Nickel	0.74	7.4	0.20	: :	0.03	0.20	0.74	1	0.03	0.20	0.65	ſ	0.03	0.20
Silver	0.009	<u>.</u> o	0.006	. ~	0.004	0.020	0.005	. د	0.004	0.020	0.009	<del>&gt;</del>	0.004	0.020
Zinc	3.83	06	0.48	¬	0.20	0.50	1.03		0.20	0.50	3.83		0.20	0.50
				1	) H- 1									

Non-detect (ND) = The analyte was not detected at or above the MDL.

Data qualifiers and acronyms are defined at the front of the tables section.

Sources: Elutriates generated by MTC, Results from ALS; CMC values from EPA (2006)



Analytical Results for PCBs in Site Water and Elutriates Generated from Sediment Samples TABLE 12

	Cample ID	.U.	V.	.H20-	S.IH20-REF-SW			PRF	PRPA-SW		N	EWWO	NEWWO20-5-Comp	ď
				1000		V V V V V V V V V V V V V V V V V V V	信息を ないない		の一般の一般の一般の一般の一般の一般の一般の一般の一般の一般の一般の一般の一般の			1		
	Maximum			ieili			31.70°C	iaitil.			Result	əiiile		
		ပ (၁)	Result	ខ៣វ		α×	na/E	zns	NON	MRL	ng/L	uĐ	MDI	MRL
Analyte		IIĜ(F	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	- 5 =	200	0000	S		0.002	0.002	QN	∍	0.002	0,002
PCB-5/8	2 !	<del>~;</del> ~	2 2	<b>&gt;</b> =	2000	0000	S	. =	0,002	0.002	·S	٦	0.002	0.002
PCB-18	2	×	2 :	<b>)</b> :	4000	1 000	2	· =	000	0000	Q.	_	0.002	0.002
PCB-28	2:	×:	음. :	⊃ <sup>:</sup> :	0.002	2002	Z Z	) <u>=</u>	0.002	200.0	Ę	D	0.002	0.002
PCB-44	<b>Q</b> ;	×	2 !	<b>)</b>	0.002	200,0	2 2	> =	0.00	2000	2	) –	0.002	0,002
PCB-49	Ω`! Ζ	×	2.6	<b>.</b>	2000	700.0	g - S	) =	0.002	0,002	:2	: :=>	0.002	0.002
PCB-52	2	×	2.5	) I	2000	200.0	2	_	0.002	0,002	S		0.002	0.002
PCB-66	S	×:	2	ב ְׁכ	2007 2007 2008 2008	200.0	2:5	) · <u>=</u>	0000	0.002	2	<u></u>	0.002	0.002
PCB-87	<u>Q</u>	×	2 !	<u>۰</u> :	0.002	2000	2 2	) =	0000	. 200 0	2	$\Box$	0.002	0.002
PCB-101	<u>Q</u>	×·	2:	<b>)</b> :	0.002	0.002	2.2	> =	2000	0.002	2	;⊃	0.002	0.002
PCB-105	Q	×	2 !	<b>)</b>	0.002	200.0	<u> </u>	ם כ	000	0.002	2	כ	0.002	0.002
PCB-118	Q.	×	<u>2</u>	: כ	0.002	2000	2 4	) ÷ <u>≡</u>	000	000	: <u>C</u>	: <u>-</u>	0.002	0.002
PCB-128	Q	×	2	⇒ <sup>:</sup>	0.002	0.002	₹:	י c:	7000	0,002	2 5	=	000	0000
000		: : : ×	2	⊃	0.002	0.002	2	<b>-</b>	0.002	0.002	<u>2</u> :	э.;	0.00	7000
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	S	×	8	כ	0.002	0.002	₽.	ص	0.002	0.002	2	⊃!: :	0.002	0.002
20110011	:: 9	; ; , >	2	-	0.002	0.002	2	⊃	0.002	0.002	2	⇒.	0.002	0.002
FCB-1/0	2· <del>2</del>	< >	S	_	0.002	0.002	8	⊃	0.002	0.002	2	: ב	0.002	0.002
TCB 180	2 2	: >	2	:⊃	0.002	0.002	S S	<b>-</b>	0.002	0,002	2	j.	0.002	0.002
PCB-183	2 2		2	=	2000	0.002	2	<b>–</b>	0.002	0.002	2	<b>=</b> {	0.002	0.002
PCB-184		< :	2.5	· <u></u>	0000	0000	2		0,002	0.002	2	⊃	0.002	0.002
PCB-187	Z.!	×	2 2	) [ [	4 6	0000	=		0.002	0.002	: <u>Q</u>	<u>.</u> =>	0.002	0.002
PCB-195	2:	×.	<u>2</u> ::	o :	200	2000	2	) =	000	0000	Q Z	⊃	0,002	0.002
PCB-206	2	×	⊋ :	<b>)</b>	0.002	0.002	<u> </u>	) <u>=</u>	0000	000	S	. =	0.002	0.002
PCB-209	QN	×	9	<b>D</b>	0.002	0,002			2000		0 0			
Total EPA Region 2 PCBs	0.044	×	0.044	.			0.044							
	An In the start of	40 40	CIM off over	<del>بر</del>										

Non-detect (ND) results use the MDL for calculating total EPA Region 2 PCBs. \*Sample was tested for analyte PCB-132/153. Non-detect (ND) = The analyte was not detected at or above the MDL.

Data qualifiers and acronyms are defined at the front of the tables section.

Sources: Elutriates generated by MTC, Results from ALS; CMC values from EPA (2006)



TABLE 14'
Analytical Results for Wet Weight Lipids and Total Solids in *Alitta virens* Tissues

Analyte:		Total S	Solids			Lip	ids	
Sample-Replicate#	Result	Qualifier	MDL	MRL	Result %	Qualifier	MDL	MRL
NEWWO20-5-Comp Rep. 1	14.04		0.04	0.04	2,2		0.010	0.010
NEWWO20-5-Comp Rep. 2	14.71	anne	0.04	0.04	2.6		0.010	0.010
NEWWO20-5-Comp Rep. 3	15.17		0.04	0.04	2.9		0.010	0.010
NEWWO20-5-Comp Rep. 4	14.78	24 M	0.04	0.04	2.4		0.010	0.010
NEWWO20-5-Comp Rep. 5	14.60		0.04	0.04	3.2		0.010	0.010
SJH20-REF Rep. 1	14.06		0.04	0.04	3.2		0.010	0.010
SJH20-REF Rep. 2	14.79	P	0.04	0.04	2.2		0.010	0.010
SJH20-REF Rep. 3	14.79	we	0.04	0.04	3.0		0.010	0.010
SJH20-REF Rep. 4	14.72	higher	0.04	0.04	2.1		0.010	0.010
SJH20-REF Rep. 5	15.39	-	0.04	0.04	2.7		0.010	0.010
Pre-exposure Rep. 1	15.68		0.04	0.04	3.3		0.010	0,010
Pre-exposure Rep. 2	15.49	ne ne	0.04	0.04	3.6		0.010	0,010
Pre-exposure Rep. 3	14.87		0.04	0.04	3.2	,	0.010	0.010

Data qualifiers and acronyms are defined at the front of the tables section.

Source: Analytical Resources, Inc.



TABLE 16 Analytical Results for Wet Weight Metals in Ailta virens Tissues

Analysical resolute to the victoria											And the second second		Market and a second	200000	一日 新学校 はおとり はず	がいいま	
			10	March Co.	Special Control of the Control of th	0.00 Mag	The state of	15			Mercury		Nicket		Silver		7
Analyte:	Arsepic		Cadmin	3	hromlum		and de la company	1000	A STATE OF THE STA	THE STATE OF THE S		10			10		100
	70JII)	<u> </u>	Doesnith Till Result of	Result				Respi	opjjen	Result and	KIDL MRE	Result in	HDL MRL	Result	G NOT HRE	Result mg/kg	S NOL WAL
Samole-Replicate #	ngkg 3 MOL M	É	are & NOL BRIL	morks	S MOL BRU	mg/kg. c	MOE		G. MUE. MAL.		S SOUCH IN DOUBLE		0.002 0.019	3 0.0211	- 0,0007 0,0078	26.7	- 0.183 0.779
Rep. 1	2.08 - 0.0009 0.0	.0078 0.	- 0.0009 0.0078 0.0287 - 0.0012 0.0039	0.178	- 0.003 0.019	\$ \$	0.043 0.019	0.178	- 0.0026 0.0039	2010					20000 20000	7.04	- 0.037 0.15B
NEWBOALS COMP Rep. 2	Z.04 — 0.0009 0.E	.0079	0.0009 0.0079 0.0228 - 0.0018 0.0040 0.238	0.238	0,003 0,020	141	- 0.013 0.020	0.163	- 0.0027 0.0940	0.0168	0,000457 0.80487	0.128	0,002 0.000				
E to Quite of the control of the con		.0078 6.	0.0009 0.0078 0.0312 - 0.0012 0.0058 0.174	5,174	- 0,003 0,020	209	- 0,013 0,020	0 0.235	- 0,0027 0,0038	0.0154	0,000415 0,00494	0.118	0,002 0,020	0 0.0257	= 0,0007 0,0078		
a day dinon-t-ozowakitki		0.9700	0.272		0.003 0.020	1,3	- 0.013 0.020	0 0.179	- 0.0027 0.0040	0,0170 -	0,000415 0.00495	0.139 -	0,002 0.020	0 0.0198	- 0.0007 0.0079	<u>단</u>	- 0.093 0.398
NEWWO20-5-Camp Rep. 4			0.0012 11.0040	0.181	0.003 0.020	. 80.	- 0,014 0,020	0 0.137	0.0027 0.0040	0.0141 -	0,000420 0.00500	D,098	0,002 0,020	0.0171	- 0.0007 0.0080	5.7.5	- 0.038 0.150
NEWWO20-5-Comp Rep. 5	1.78 - 0.000a u.	70007	Tionin Tionin					0.478		0.0157		0.122		0.8213		.8.8	
NEWWO20-5-Comp Mean	2.08	. :	0,0248	0,208		1.47						803		5		402	
% of Reference	103		26	109		160		<u>ह</u>		<b>s</b>						٤	0.003 0.388
	0 9000 - Fa t	0800 6	0.0000 0.0000 0.0042 0.00012 0.0040 0.202	0.202	- 0,003 0,020	1,42	- 0.014 0.020	0.144	- 0,0027 0,0040	- 6810'0	0.000416 0.00496	0,124 ~~	0,002 0,020	20 0.0136 	Nabala 1908.		
SJHZ0-REF Rep. 1	1	9	0.150	0.130	- 8,003 0,020	1,58	- 0.014 0.020	0.0830	- 0,0027 0,0040	0.0185	- 0.000414 0.00493	0.122	0,002 0,020	20 0.0093	0.00007 0.00000	8.83	- 0.038 0,160
SJH20-REF Rep. 2	2.03 - 0.0008 0.	0,000					2000		- 0.0027 0.0040	0.0174	- 0.000410 0.00488	860,0	- 0.002 0.0	0,020 0.0131	67007 0.0079	6,26	- 0.037 0.159
SJH20-REF Rep. 3	1,84 - 0,0008 0.	0,0079	- 0.0009 0.0079 0.0248 - 0.0042 0.0049 0.175	0.175	- 0,603 0,02d	P					28700 G 2070000	: \$	0.002	5.020 0.0118	0.0007 0.0080	30.5	- 0,188 0,799
S.H20-REF Rep. 4	1,97 - 0,0009 0	0,0060	- 0,0008 0,0080 0,0312 - 0,0050 0,0200 0,226	0.226	- 0,003 0,020	1,67	- 0,014 0,020	8 129	- 0,0027 0,6040	1,020,1						. 3	
1			n n 248 - 0.0012 0.0040	0.164	- 0,003 0,020	1.48	- 0,014 0,020	20 0.126	6 - 0.0027 0.0040	0.0165	- 0.000412 8.00491	0,084	- 0,002 0.0	0.02U U.0130	- 0,000		
SJH20-REF Rep. 5	A 2000'S - 1777			.0,0		1.87		0.519	6	0,0187	-	0.114		6,6123		14.5	
S.HZ0-REF Mean	2.02		6.0257	a l		- 1		J		4000	0.000416 0.00496	0,156	- 0.002 D.0	0.020 0.0189	0 - 0,0007 0,0080	0 11,2	- 0.094 0.400
Pre-exposure Rep. 1	2.27 - 0.0009 0.0080 0.0243	0.0080	0,0243 - 0.0012 p.0040 0.181	0 0.181	0.003 0.020	135	0.014 0.020		)							: 3	0 950 0
			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0.186	- 0.003 0.020	1.33	- 0.014 0.0	0,920 0,9677	77 - 0.0027 0.0040	0.0234	- 0.000417 0.00496	0,133	0,002 0.0	0.020 0.0367	mennin innain - i		
Pre-exposure Rep. 2	2.28 - 0.5009 u	200	7070	- 1			. 1	0.020	81 ~ 0.0027 0.0040	0,0255	0.000418 0.00498	0.137	- 0.002 0.0	0,020 0,0194	4 - 0,0007 0,0080	7.02	- 0.037 0.159
Pre-exposure Rep. 3	2,42 - 0,0009 0	0.0030	0,0009 0,0680 0,0280 - 0,0012 0,040	0.178	Z0,00 0,000 ↔					900		294.0		9,0180	Q	8,94	
Pre-exposure Mean	2.32		0.0252	0.182		ឌ្		0.0752	26	n contra		,		,		<u>*</u>	
FDA Action Level	7.6			젊	,	×		\$2		-		2					
			The Montanter of the Man that of the reference lissues and at least two replicate results are greater than the MOL	olly oreale	r than that of the re	ference lis	sues and at leas	taro repă	rate results are greater i	han the MC	귀						

Boided values indicate that the meen concentration of project tissues is statistically significanly greater than that of the rele

Sourcas: Analytical Resources, Inc.; FDA action lavels from FDA (2001, 2011); EPA Region 2 Guidance Manual (2016) Compiled by: ANAMAR Environmental Consulting, Inc.



TABLE 18 Analytical Results for Dry Weight Metals in Alitta virens Tissues

וופל וופל ואפני אום היים										}							1	State Control	大学 は大学 はない はいかい かいかい かいかい かいかい かいかい かいかい かいかい	A CONTRACTOR	C. Cilmor School Co.	8 2 3	September 1	7fnc	0000000
The Palent of the Second Secon	Service Servic	Arsenic	選逐 章	Cadmium	生 新田屋	Second Chr	romium		1000000	Copper			Lead			метситу		2	SACTOR STATES	March Colonia		130	13000	100	
	Result a	Result all for Result Mor	Resu	Joygjer =		S S S S S S S S S S S S S S S S S S S			Result	Jayjjeni		Resul	Result Auglitor	MEN.	Result		H. 17.1	Result Gualifler	NDE MRL	Result Tollisuo Cousillor	MOL	MRC.	Result mg/kg ga	Oualifier 콜	掘
sample-Replicate#	m <sub>D</sub> /kg	G KOL H	S mg/k	G G MDF	MR.	mg/kg/ C	JON OF	MRC 0 135	10.2		. E	5 1.27	0.0	.! -	-	- 0,00289	0.0344 0.	0.933	0.0142 0.135	0.150	- 0.00499 Q	0.0556	061	1,30	5.55
IEWW020-5-Comp Rep. 1	14.8	- 0,00841 0,0556	555 6.204		- U.DB635 V.VZ78								t	0.0184 0.0272	72 0.107	. 0.00263	0.0338 0.	- 9780	0.0138 0.136	0.158	0.00476 0	0.0537	49.0	. 0.252	1.07
JEWWO20-5-Comp Rep. Z		0.00612 0.004		1	1 0 0257	5.7	80100 -			- 0,0857	57 0.132	1.56	1	0,0178 0.0257	57 0,102	- 0.00274	0.0326 0.	0.778 ==	6,0132 0,132	0.169	- 0,00481 0	0,0514	19	표 :	5,15
NEWWOZE-S-comp Mep. 3		rennan'n			4,000			1 0 138		 ~ 0.0880	80 0.135		: 1	1,00183 0,0271	71 0.115	- 0.00281	0.0335	0,940 -	0,0135 0,135	0.134	- 0,90474 0	0.0535	86.8	0.629	2.68
(EWWO20-5-Comp Rep. 4		- 0.00609 d.u533	0335 03350		U,00012 V,0211		_						1	0.0185 0.0274	74 0.0956	- 0.00288	0.0342 0.	9,658	0,0137 0,137	0.317	- 0.00479 0	0.0548	39.3	. D.260	1.30
VEWWO20-5-Comp Rep. 5	122			i i	0 00 BC 0 000 BC	1	- 1	- 1		0.100	DG 0.142	1,02	1	0,019 0.0284	84 0.142	0.0030	0,0353 0.	0,882 -	0.014 0.142	5 0,0967	- 8,0050 0	6950'0	108 -	1990	2.83
SJH20-REF Rep. 1	) 4. 0	resenta toman -			- 00000	1.28			10.7	- 6.095	35 0.135	1950 25	ı	0.018 6.0270	70 0.132	0.0028	0.0333 0.	0.825 -	0.014 0.135	5 0.0569	0.0047 0	0.0541	60.8	- 0.257	1,03
SJH20-REF Rep. 2		- 4.0081 u.u.							7.08	- 0 665	55 D.135	5 0.730	: 1	0.018 0.0270	70 0.518	970028	0,0330	0,553	0.014 0,135	5 0,0886	- 0,0047	0.0534	42.3	- 0.250	1.08
SJH20-REF Rep. 3	£.	- 0.0061 0,0534	534 0.168		0,0081 0,0270	. : 81.7 ·	1 000	- 1				<u> </u>	:				<del></del>		2014	0000	0.0068	0.054.3	207	1.28	5.43
SJHZO-REF Rep. 4	13.4	- 0,0061 0,0543 0,212	543	12 - 0,04	- 0,0410 0,1360	1,54	- 0.020	0°,136	11.3	260'0 ←	95 0.136	36 0,876	ı	a.o18 0,0272	72 0,137	0,0026		1,000,U	100						
SJH20-REF Rep. 5	14.4	0,0 8200.0 -	0,0520 0.161	1	0,0078 0,0280	1.07	- 0.019	9 0.130	9.62	- 0.091	91 0,130	30 0.838	٠	0.018 0.0280	60 0.107	0.0027		0,611 -	0.013	-	0.0045	0.0520		1	Re'7
Pre-exposure Rep. 1	14.5	- 0.0057 8.0510	510 0,155	1	0,0077 0.0255	1.15	- 0.019	9 0.128	8,61	- 0.089	89 0,128	28 0,509	ş	0,017 0,0255	55 0.147	- 0,0027	0,0316 0	- 566'0	0.013 0.128	8 0,15	0.0048	0.0510	· č	Becon	
Ora ovnostite Ren. 2	14.7	0.0058 0.0516 0.150	516 0.12	. 1	0.0077 0.0258	120	0.019	9 0.129	. 82,58	- 0.090	90 0.128	28 0.437	f	0.017 0,0258	58 0.151	- 0.0027	0,0320,0	0.859	0.013 0.129	9 0,108	0.0045	0.0516		0,245	<u> </u>
	. 5	- 0.0051 0.0538 0.188	538 0.18	- 1	0.0081 0.0269	1,20	- 9.020	00 0.134	8.58	- 0.0B4	B4 0.134	34 0.525		0,018 0.0269	269 0,171	71 - 0.0028	0,0335 0	0,827 -	0.013 0.134	4 0.130	- 0,0047	0.0538	47.2	- 0.249	70,1
re-exposule rep. 5	1		-	1														İ							
		and the food of the	seed of the tables seedles	, ijo																					

Data quakiters and acronyms are defined at the front of the tablos section.

Source: Anabylical Resources, Inc. Compiled by: ANAIMAR Envisonmental Consulting, Inc.



Analytical Results for Wet Weight Pesticides in Macoma nasuta Tissues TABLE 19

	and the second s	Annual Control Con-	And Shipperson	Section of	Section of the	Control of the Contro	2000			1000	Carles (for 8 Derivative	P. Dorden	N. S.					Heptan	hlor & D	Heptachlor & Derivatives	6	11.00
C. S. C.	DDT&L	DDT & Derivatives			Harry Services			T. CONTROL	12.00		Tanana I						311	and page of	数	STATE OF THE PARTY.	**********	
			TOWN	100000		Dieldrin		Endo	Sulfan	を登り	Endos	Endosulfan II		Endosu	Endosulfan Sulfate	2	Hep	Heptachlor		Heptachlor Epoxue	NOT EDG	y C
	Agente Times	Result	Result altiler		Result ialifier		15 / 31 444	relilier	8090 C	***	Result ualifier		2	Section 1	Į.	8	Result Qualifler	IQM		Sesul History Tellisup	2	, E
Sample-Replicate #	RO'KG & NDL MRL	ps/or	G MOL	MRC	pg/kg d							٠,			1	-		500	-		5.13	0.50
NEWWO20-5-Comp Rep. 1	<1.00 U 0.19 1.00	8	U 0.33	8	<1.00 U	0.12	8; A	<0.50 U	0.07	0.50	41.00 U				7 1						. 0	ę.
NEWWO20-5-Comp Rep. 2	<4,00 U 0,19 1.00	4.8	U 0.33	1.00	<1,00 U	0.12	9. A	<0,50 U	0.07	0.50	4,00 U	0.31	1,00 1,00	o . 87 :	. D.12	-		e :	<u> </u>	1		3 !
NEWWOOD-S.Comp Rep. 3	< 0.19 1.00	음 ▽	0,33	. 83.	4,00 €	0,12	8:	<0,50 U	0.07	0.50	≺1.00 ∪	0.31	9; A	41.00 U	0.12	8.	c0,50 V	0.05	8	0.50 U	0.17	0.50
NEWWO20-5-Comp Rep. 4	-1.00 U 0.19 1.00	. 41.00 . 1.00	U 0.33	1,00	<1.00 U	0.12	60,1	<0.50 U	20'0	0.50	41.00 U	0.31	7.03	U 00.1>	0.12	V	co,50 U	0.05	동 6	•	0.47	0.50
NEWARKOOLE, Comp Bep. 5	<1.00 U 0.19 1.30	. 62.00	. 0.33	: 60,	<1,00 U	0,12	. 001	<0,50 U	70.0	0.50	c1.80 U	0.31	1,00	U 00.1>	0.12	1.00	<0,50 U	500	0.50	∩ 09.0>	0.17	0,50
NEWWOOD S.Comp Mean	0,19	0.33			0.12		<del>  -</del>	0,07			0.31		<del></del>	0.12			50,05		., .	0.17		
of the farmers	001	<b>1</b>			601			100			100			500			100			100		
A med men o	1 0,19 1.00	0 7,00	U 0.33	1.00	1,00 U	0.12	1.00	<0.50 U	70,0	0.50	c1.00 U	0.31	1.00	<1.00 U	0.12	8.	<0.50 U	0.05	0.50	. 09°0>	0.17	0,50
Sulfarenti Nepri	U 0,19	<1,00	U 0.33	1.00	<1.30 U	0.12	1,00	O.50 U	70.0	0.50	<1.80 U	0.31	1.00	<1.00 U	0,12	£00	<0.50 U	0.05	99 :	-0.50 U	0.17	05.0
SUNZO-NET NEP. 4	U 0.19		U 0.33	1,00	1,00 ℃	0,12	8	<0.50 U	20'0	0.50		0.31	8.	<1.00 U	0.12	80.	~0.50 U	0.05	0.50	. co.5o ∪	0.17	0.50
SH20-REF Rep. 4	<b>-</b>	- V	U 0.33	8	<1.90 U	0,12	8,1	U 05,0>	20.0	0.50	<1.00 U	0.31	8	41,000 U	0.12	97.	10.50 U	6.05	0.50	. 05.0×	0.17	0.50
S H20-RFF Rep. 5	C1,00 U 0,19 1.00	0 <1.00	L 0.33	1.00	<1.30 U	0.12	1.99	U 05.0>	0.07	0.50	<1,00 U	0.31	00,1	J 00.1>	0.12		<0,50 U	90.0	080	<0,50 U	0.17	0.50
S.1H20-REF Mean	0.19	0.33			9,12			0.07			0.31			0.12			0,05		<u> </u>			
Bre avocative Rep. 1	<1,06 U 0.19 5.00	0.00	U 0.32	1.00	c1.00 U	0.11	26.	<6.60 U	1 0.07	0.50	<1.00 U	0.31	8	51,00 U	0.12	8	40.50 U	0.05	05,0	n ::		05.0
C to B entropy and	<1.00 U 0,19 1.00		U 0.33	1.00	. 00.1>	0,12	1.00	U 02,0>	70,0 (	0.50	4,00 U	0.34	8.	41,00 U	0.12	00.	U 05,0>	0,05	0,50	O'20	0.17	0.50
Pre-exposure Rep. 3	0.19		U 0,33	3 1.00	ก ส.90	0,12	7.00	<0.50 U	70,0 (	0.50	<1.00 U	0.31	1.90	<1.00 U	0.12	8.	c0.60 U	90.0	0.50	_ !	U 0.17	0.50
Pro-exposure Mean	0.19	0.33	.;		0.12			20.0			0,31		.	0,12	1	<i>f</i> -	0.05			0.17		
FDA Action Level	×	2000			300			×			×		$\dashv$	×			300			200		

Bolded values indicate that the mean concentration of project itssues is statistically significantly greater than that of the reference tissues and at least two replicate results are greater than the MDL. The value indicates the MRL. Acronyms and qualifiers are defined at the front of the tables section.

Sources, Analydral Resources, Inc.; FDA action levals from FDA (2001, 2011); EPA Region 2 Guidance Manual (2016)



TABLE 20 Analytical Results for Wet Weight Pesticides in *Allita virens* Tissues

					100		of the Control of the	100	New Mark	100	No.	Wilder State	- Parket	Codocraften & Devidentives	avite Urv	4					Heb	Schlor	Reptachlor & Derivatives	fives		
	ICC	<b>DDT &amp; Derivatives</b>	Valives					123/2/2015		1						L	101					2000	Tall I	Hentachior	Enoxide	01 (C
		<b>数</b>	THE REAL PROPERTY.	TOP		# 85 K F F	Dielden	# 1888	遊廳	Erd	Endosulfan		ű	Endosullan	11	3	Endosultan Sultate	an Sulta	4	au .	pracision				70.7	
	2,4-301				1000年		影像		<u>新</u>	1000		1900		100		lesto	19			Jot				79.N		
	Result all to	<b>.</b> .	Result Tellifer				ទាវិវិទេប		8 5	Result Milent	Ğ	12	Result		MAL	Result L pg/kg	≓ D TilsuO	MOL	RE PE	Result 교 Pg/kg 권	Q.	MRL	Result	lisuD	MOL	E E
Sample-Replicate #	ngkg & MDL M				:1	_	<b>5</b>	(I		1	1		00 t>	U 0.31	1.00	41.00	⊐ 8	0.12	1.00	<0.50 U	0,05	0.50	<0.50	o D	0.17 0.	0,50
NEWWO20-5-Comp Rep. 1	<1.00 U 0.19 1.	200.	47.00	U 0.33	3 1.00	 8	>	7.0	/  }									;				0	· · ·	=======================================	n 17 0	0.50
NEWARKIOSO, S. Comp Ben. 2	<1.00 U 0.19 1.	1.06	6.00 Y1	<6,00 Y1, U 8.00	0.00	8,5	Þ	0.12	8.	to 660 U	1 0.07	DS'O	۲.00 دا.00	U 0.31	7. 1.00	0	ລ : ຂ :	0,12	8 :	00.00						;
	. 670	90	\$ 00 ×	Y1 U 5.00	0 2.00	\$ \$	. 3	0,12	- 23 - A	<0.50 U	0.07	0.50	0,°	U 0.31	1.00	0 <1.00	2	0.12	4.00 4.00	U 08,0>	0.05	0.50	\$0.50 \$	o ⊐ •	0.17	0,50
NEWWYOZU-5-COMB INCh. 5			5		100	87 7	. :>	0.12	1.90	O 05.0>	70.07	0.50	. v	U 0.31	31 1.00	7.00	⊃ 8	0.12	1,00	U 06,0>	0.05	0.50	40.50	o ,	0,17 0	0.50
NEWWO20-5-Comp Rep. 4	· · · · · · · · · · · · · · · · · · ·	<del></del>					, 5			-0.50 U	5 0,07	0,50	41.00	U 0,31	31 1,00	00.15	; n	0.12	1,80	c0.50 U	1 0.05	0.50	<0,50	o D	0.17 0	0.50
NEWWOZ0-5-Comp Rep. 5	<1.00 U U.18		١.	ĺ	- 1	+		- [ ]	╀				3			10.0		- 1		0,05		:  -	0.17	: -·		
NEWWO20-5-Comp Mean	0.13	<del></del>	2,40			- - -			-	0.07			Š				ŧ					٠.	. §			
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	100	<b></b>	7			100			<del></del>	100			50			=	2		-	a			2			T
% of Netol Cities	0	8	50.8	24 D Y1 U 4.00	4.00	2. 8.	=	0.12	83,7	<0.50	TO,0 U	0.50	4.00	٥	0,31 1.6	1.90	41,00 U	0.12	1,68	<0.50	U 0.05	0,50	0.50	5	0.17	0.50
SJH20-REF Rep. 1										- 65.07	7,00	033	40.32	3	0.31	0.32	-0,32 U	0,12	0.32	2.70	0.05	5 2.70	2,70	_	0.17	2.70
SJH20-REF Rep. 2	<1,00 U 0.19 1	9.	3.00	Y1, U 3.00	00 3 00	ا ا	٠ ;						:		ļ			: !	<del>.</del>				- 6	: =		2,0
	2100 11 0.59	. 8	<3.50 Y	Y1, U 3,50	50 3.50	41.50	ت د	0.12	1,50	<0.32 \	U 0.07	0.32	<0.32	ر م	0.31	0.32	60.32 	0.12	0.32	2	g :		·			 }
יייייייייייייייייייייייייייייייייייייי						7	: =	0 42	- 65	<0,32	. 0.07	0,32	<0.32	Þ	0.31 0.0	0.32 <0	<0.32 U	9,12		<2.70	U 0.05	5 2.70	0 <2.70	<b>5</b>	0.17	2.70
SJH20-REF Rep. 4	<1.00 U 0.19	 8	: ; ;	3 : 5 :	W-1						: !	: 8	: 6	: =				0.72	0.32	<2.70	U 6.05	5 2.70		<b>_</b>	0.17	2.70
SJH20-REF Rep. 5	<1.00 U 0.19	8	<6.00 Y1, U	7, U 6.00	00.8	0 <1.50	ے ا	27.72	130	20.32	200		7	- 1		+-			-	,	ľ		- 5			Ī
S.1H20.REF Mean	0.19		3.37			<u> </u>	ru	-		0.07			634			ci	0.12	•		600						T
	21.00	8	43.00 V	Y1, U 3.00	3,00	0 <1.00	2	9,12	1.00	<0.50	U 0,07	7 0,50	<2.00	ລ	0.31	8.	C1.90	0.12	8	<0,50	50.0 1	5 0.50 	05.0 	: :	0.17	<u> </u>
Pre-exposure Kep. 1	; ;				300 3.00	- F	. s	0.12	8	<0,50	U 0.07	0.50	06,P>	<u> </u>	0.31	1.00	J 00.25	0.13	3.00	<0.50	U 0.05	5 0,50	0 0.50	J	0.17	0.50
Pre-exposure Rep. 2	er.u u ou,r>	3		} }				!		ę	200	0.50	2	=	0.31	8	41,00 U	0.12	9,	<0.50	U 0,05	5 0,50	0 <0.50	Þ	0.17	0.50
Pre-exposure Rep. 3	<1.00 U 0.19	00,1	<3.00 Y1, U	71, U 3.00	3.00	0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15	2	0,72	3	- 1					ļ				+	30.0			2,42			
Pre-exposure Mean	0.19		3.00			0.12	2	:		20.0			0.31			1	21.2			200			2	-	1	
EDA defion Level	×	-	2000						•	×			×			$\dashv$				200			_{_			
		-										1	C william .	adona at	Shad the MA											

Bolded values indicate that the mean concentration of project issues is statistically significantly greater than that of the reference tissues and at least two replicate results are greater than the kMD.

< 此事 The analyte was not detected (NID) at or above the kMD. The value indicates the MRL.

Acronyms and qualifiers are defined at the front of the tables section.

Spurces: Analytical Resources, Inc.; FDA action levels from FDA (2001, 2011); EPA Region 2 Guidance Manual (2016) Compiled by: ANAKAR Environmental Consulting, Inc.



TABLE 21 Analytical Results for Dry Weight Pesticides in Macome nesula Tissues

			(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	Sanificial of Port			2000 2000 1000 1000							Ende	Endosullan & Derivalives	& Deriv	atives					Ē	ptachle	or & Dev	Heptachlor & Derivalives		
Analyre:					7. Juny		(100)		Dieldrin			Endosulian I	fan I	搬網	Endos	Endosullan II		Endo	Endosulfan Sulfate	uffate		Heptachlor	Jor		Heptachlor Epoxide	r Epox	epi
	Zenti Pesult iii	e Tellilei		Result 1	na)iiler		153141 - 124 - 1		rəifiler		Result	។ទពិពិនបរ		Result noted	Result Polisuc	IOM		Result ua/ka	TelfilsuC 플	<b>ğ</b>	Result 1197kg	Qualifier	MDL	Result MRL µg/kg	Result all Congressions of the Congression of the C	W	M T
Sample-Replicate # NEWWO20-5-Comp Rep. 1	pg/kg <5.70	0.4DE	DE MRU 38 5.70	C   Hg/kg		3 8	6.70	4grkg-		- 1		ם כ	1	<del>-</del>			<del></del>	6.79	U 0.684	64 5.70	<2.85	70 D	0,285 2,1	2.85 <2.	<2.85 U	696'0	2,85
NEWWO20-5-Comp Rep. 2	17:5>	u 4.10	10 5.77	7 <5.77		U 1.90	5.77	46.77	U 0.692	5.77	<2.88	ם	0.404 2.1	2.88 <6.	46.77 U	1,79	5.77	<b>11.5&gt;</b>	U 0.692	5.77	<2.88		0.288 2.	2,88	<2.88 U	0.980	2.88
NEWWO20-5-Comp Rep. 3	<5.73	. u	1.09 6.73	3 <5.73	; <b>&gt;</b>	1.89	5.73	<5.73	U 0.687	7 5.73	2,86	⊃	0.401 2.	2.86 <5.	<5.73 U	1,78	5.73	<5.73	U 0.687	5.73	2,86	o . □ .	0,286 2.	2.86	<2.86 U	0.974	2.86
NEWWO20-5-Comp Rep. 4	<5.66	U 1.07	07 5.66	5 <5.66	, <b>:</b> 2	1.87	99'9	<5.66	U 0.679	9 5.66	2.83	>	0,396 2	2.83	<5.66 U	1.75	5,66	<b>5.86</b>	U 0.679	5,68	<2.83	ე ე	0.283 2.	283 :	<2.83 U	0.962	2.83
NEWWO20-5-Comp Rep. 5	<6.08	· ¬	1.15 6.08	8 -6.08	ے ت	5.00	6.08	<6.08	U 0.729	9 6,08	43.04	ລ	0,425 3.	3.04 <6	<6.08 U	1.88	6.03	80.98	U 0.729	29 6.08	2.5	2	0.304 3.	3.04	3.04 CM	1.03	30.
S.1H20-REF Rep. 1	<5,83	J 7	1.11 5.83	3 <5.83	22	1.92	5.83	<5.83	U 0,699	9 5,83	3 <2.91	n	0,408 2.	2.91	<5.83 U	80,	5,83	<5.83	U 0,699	89 5.83	42.9	Ģ ⊃	0.291 2.	2.91	<2.91 U	0.991	2.91
S HOD BEE Ren 2	<5.46	⊃ ±	1.04 5.46	6 <5.46	<u>ລ</u>	1.80	5.46	<5,46	U 0.655	5 5.46	2.73	⇒	0,382 2.	2.73 <6	<5.46 U	1,69	5,46	<5,46	U 0,665	55 5,46	<2.73	=	0,273 2,	2,73	0.87.2> ∴	0.928	2.73
SUITOURE Ren 3			1,10 5,78	8 <5.78	<u>ت</u> ھ	26	5.7B	<5.78	U 0.694	4 5.78	3 <2.89	⊅	0.405 2.	2.89	<5.78 U	1.79	5.78	<5.78	U 0.694	94 5,78	<2.89	⇒ i	0.289 2.	2.89	-2.89 U	0,983	2.88
SJH20-REF Rep. 4		=	1.05 5.55	5 <5.55	. U s	. 8.	5,55	<5.55	U 0.656	6 5.55	5 2.77	ח	0.388 -2	2.77 <5	<5.55 U	1.72	5,55	<5,55	U 0.665	85 5.55	42.77	'n	0.277 2.	2.77	2.77 U	0.943	2.77
SJH20-REF Rep. 5	42.74	. T	1.09 5.74	4 <5.74	. ⊃	1.89	5.74	<5.74	U 0.689	5.74	4 2.87	⊐	0.402 2	2.87	<5.74 U	1,78	5.74	42.74	0 0.6	0,689 5,74	2.87	>	0,287 2	2.87	2.87 U	0.976	2.87
Pre-exposure Rep. 1	<5.49	, n	1.04 5.49	67 <5.49	n e	1,76	5.49	<5.49	U 0.604	и 5.49	9 <2.75	⊃	D,385 2	2.75	<5.49 U	1,70	5.49	<5.49	9.0 D	0,659 5,49	2.75	Ħ	0.275 2	2.75	c2.75 U	0.934	2.75
Prc-exposure Rep. 2	<5.56	ສ	1,06 5,56	×5.56	ກ ຜູ	8.	5.58	<5.56	U 0.667	17 5,56	6 2.78	⊃	0,389 2	2.78	-6,58 U	1.72	5.56	<b>45,56</b>	U 0,667	67 5.56	2.78	<b>=</b>	0.278 2	2.78	<2.78 U	0.945	
Pre-exposure Rep. 3	<5.42 U		1,03 5,42	5.42	กส	1.79	5.42	<5.42	U 0.651	51 5.42	2 2.71	<b>⇒</b>	0,380 2	2.71 <	<5.42 U	1,68	6.42	<5.42	U 0.651	51 5.42	<2.71	<b>=</b>	0.271 2	2.71	42.71 U	0.922	271

<#### = The analyte was not detected (ND) at or above the MDL. The value Indicates the MRL. Acronyms and qualifiers are defined at the front of the tables section.</p>

Source: Analytical Resources, Inc. Compiled by: ANAMAR Environmental Consulting, Inc.



TABLE 22 Analytical Results for Dry Weight Pesticides in *Alitta virens* Tissues

			18 E			経験		必必					で変数			Endosulan & Derivatives	Han &	Deriva	saviti				XXX Tibia		Heptac	thor &	Heptachlor & Derivatives	ives		
Analyte:					2	TOU.				Dieldrin		1850 1850 1850 1850 1850 1850 1850 1850	Endo	Endosulfani			Endosulfan II	Ifan II	加設	Endo	sullan	Endosulian Sulfate		Hept	Heptachlor		Hepta	Heptachlor Epoxide	Epoxic	
	Result is	7 Telfilar		Res	A A A A A A A A A A A A A A A A A A A	nelitier		200 100 100 100 100		reillisu				telliku) E	1000 A	Result	relitient	Q	I INN	Result	Te(filsu⊊ ≅	MDE MRL	Result	a ≒ Qualitier	MOL	M.	Result µg/kg	1eBilsuΩ ≅	90	
Sample-Replicate #	11 Kg	က် ကြ ⊃	MDE: M			g: l	235 7.12		1197KG C	G: MUL.		12 <3.56	ກ	0.489	3.56		כ	. I	<u> </u>			1		כ	0.356	3,56	<2.85	0 :	636'0	2.85
NEWWO20-5-Comp Rep. 2	<6.8D	· - · . U 1.29		6.80 <40	<40,8 UJ	UJK,U 40	40.8 40	40.8	<6.80	 U 0.816	S	80 <3.40	40 U	0.476	3.40	<6.80	. =	2,11	6.80	- C8:80 :	. 0.8	0.816 6.80	0 <3.40	э. 9	0.340	3.40	<2.88	o' ⊃ ,	0.980	2.88
NEWWO28-5-Comp Rep. 3		=	1,25 6.	6.59		UJK U 33.0		33,0	<6.59 t	U 0,791	91 6,59	59 <3,30	30 U	0,461	3.30	<6.59	>	2.04	6,59	<6.59	U 0.7	0,791 6,59	8 <3,30	.n g	0.330	3,30	<2.86	D O	0.874	2.86
NEWWO20-5-Comp Rep. 4	<6.77	<b>∵</b>	1.29 6.	6.77 <6.	. 11.9>		2.23 6.	. 77.9	<6,77 1	U 0.812	12 6.77	77 <3.38	.38 U	0,474	3,38	<6.77	ລ	2.10	6.77	<6.77	3. 9.	0,812 6,77	7 <3.38	⊃ 88	0.339	3.38	2.83	D D	0,962	283
NEWWO20-5-Comp Rep. 5	<6.85	⊐ 4	1.30 E.	6.85 <6.	<6,85	7	2.26 6.	6.85	<6.85 l	U 0.822	22 6.85		<3,42 U	0.479	3.42	<6.85	::	2,12	5.85	<6.85	U 0.6	0,822 6.85	5 <3.42	n 2	0.342	3,42	<3.04	5	1,03	3.04
SJH20-REF Rep. 1	47.11	U 7	1.35 7	7.11	28.4 UJ	UJK,U 2	28.4 2	28.4	<7.11	U 0.853	23 7.11		<3.56 U	0.498	3.56	<7.11	b	2.20	7.11	<7.11	30 .	0.853 7.11	1 <3.56	J 95	0.356	3,56	<3.56	<b>5</b>	1.21	3.56
SJH20-REF Rep. 2	-6.76	⊃	1.28 6	5.76 20	203 U.	 UJK,U 20.3		20.3	<10.1	U 0.811	111 10.1		<2.16 U	0,473	2.16	- 22.16	<b>⇒</b>	2.10	2.18	2.16	n 93	0.811 2.16	6 <18.3	න ල	0.338	83	<18.3	<b>3</b>	1.15	18.3
SJH20-REF Rep. 3	<6.76	. =	1.28 6	6.76	23.7 LL	UJK,U 2	23.7 2	23.7	<10.1	U 0.811		10.1	<2.16 U	0.473	3 2.16	42.16	n	2.10	2.16	<2.16	56 D	0.811 2.16	<18.3	ຄ	0,338	18.3	<18.3	ב ב	1.15	18.3
SJH20-REF Rep. 4	<6.79	⇒	1.29 6	6.79 <6	· 6.79	. a	224 6	. 6.79	<10.2	U 0.815		10.2 <2.	<2.17 U	0,476	3 2.17	42.17	э.	2.11	2.17	<2.17	o O	0.815 2.17	17 <18.3	ာ ဗ	0.340	18.3	78,3	ם !	1.15	18.3
SJH20-REF Rep. 5	<8.50	. ⊃	1.23 6	. 6.50	39.0 U	uku 3	39.0	39.0	<9.75	U 0.780		9.75 <2.	<2.08 U	0,455	5 2.08	<2.08	Э М	2.01	2.08	<2.08	U O.	0.780 2.08	₽	.5 U	0.325	17.6	<17.5	ם	1.10	17.5
Pre-exposure Rep. 1	46.38	٦	121	6.38	19.1 U	UJK13 19.1	i	19.1	6.38	)2'0 N	0,765 6,3	6,38	G.19 U	3 0,446	3.18	<6.38	<b>5</b>	1,98	6.38	<6,38	<b>5</b> .	0,765 6,38	-3.19	₽. `	0.319	3.19	δ. Φ.	- ⊃ {	1.08	3.19
Pre-exposure Rep. 2	<6.46	=	1.23	6.46	19.4 U	UJK,U 19.4		18.4	<5,46	1. O.7	0,775 6.4	6.46	<3,23 U	J 0,452	3.23	<6.46	n .	2.00	6.46	<19,4	o n	0.839 19.4	4 43.23	ລ ຂ	0.323	323	<3.23	ב <u>'</u>	6.	3.23
Pre-exposure Rep. 3	<6.72	Þ	1.28	6.72	20.2 U	WK,U 2	20.2	20.2	· <6.72	U 0.807	I	6,72 <3.	<3.36 U	0.47	3.36	<6.72	7	2.08	6.72	<6.72	U 0.	0.807 6.72	72 <3.36	36 U	0.336	3.38	338	-	1.14	3.36
					'			į																						

< 4. ## = The analyte was not detected (NID) at or above the MDE. The value indicates the MRL.

Acronyms and qualifiers are defined at the front of the tables section.

Source: Analytical Resources, Inc. Compiled by: ANAMAR Environmental Consulting, Inc.



TABLE 23 Analytical Results for Wet Weight PAHs in Macoma nasuta Tissues

				100		Average 1	1		Fluorene		no en o	0(1,2,3-0	-cd)pyrene llaw		Naphthalen	alene		Рлепап	Phenanitireno USY		Pyren	Am aua	
Analyte	Chrysene	Olbenze	naju (a)	Olbenzeja,njanuracene		V. 10 / 20 / 20 / 20 / 20 / 20 / 20 / 20 /	3			2000	語答的	自然		維整	10		经规则	10			10		
	Result in the second second in the second in	Result	Tellile:		Result	រទ[វ]រៀនប ភូ	95011 <b>5</b>	Result	elilisus E	# F	Result	ajjjient	MOL	MR4. PS	Result parks	RIDE	Re MRL 199	Result	MDL	NRL P	Result = pg/kg	MDI	M.R.
Sample-Replicate #	porke & MDL MRE		\$	<b>\$</b>   {	<u></u>	0	300	5 USA	1	1		1	10,5 5(	ļ	<50,0 U	12.8	50,0	<50.0 U	7.18	50.0	8.12	6,25	50.0
NEWWOZ0-5-Comp Rep. 1	<50.0 U 10.5 50.0	<60.0	eć ⊐	8.91 50.0		7					9			- V		12.8	50.0	<50.0 U	7.18	50.0	7,12	J 6.26	50.0
NEWWO20-5-Comp Rep. 2	<50.0 U 10.5 50.0	<50.0	ø ⊃	8.91 50.0	6.92	3 4.70		0.000			3			<u>.</u>		. 62		<50.0 U	7.18	50,0	8.95	J 8.26	50.0
NEWWO26-5-Comp Rep. 3	<50.0 U 10.5 50.0	<50.0	e ⊃	8,91 50,0	5,98	J 4.70	0.05	\$50.0	U 5.31													828	20.0
NEWWO20-5-Comp Rep. 4	<50.0 U 10.6 50.0	<50.0	9	8,91 50.0	5.97	3 4.70	0.02 0	0°95>	U 6.31	31 50,0	<50.0	>	30.5	50.0 20.0	<50.0 LI	12.8				3		-	
NEWORNOSO & Comp Ren. 5	<50.0 U 10.5 50.0	<50.0	æ ⊐	8,91 50.0	5.37	J 4.70	0.03 07	<50.0	U 6,31	31 50.0	<50.0	ā	10.5 5	50.0	€50.0 U	12.8	20.0	Ω (36,0 Ω	7.18	20.0		626	200
NEWWOOD CONTRACTOR		1			05.30	:		631			10.5				12.8		· ·	7,18		!	8,01	· .	•
NEWWO20-5-Comp Mean	cm.			-				. 2			8				100			100			128	,	
% of Reference	100	3	` [		+	:	000	1	11 621	21 500		12	10.5 6	50.0	<50,0 U	12.8	50.0	<56.0 U	7.18	50,0	<50.0	U 6.26	56.0
SJHZO-REF Rep. 1	<50.0 U 10.5 50.0	0; 0; 	<b>⇒</b>			•			,			=	10.5	2005	-: <50.0 U	12.8	20.0	รอ.ช	7.18	50.0	<50.0	. e.28	5 50.0
SJH20-REF Rep. 2	<50.0 U 10.5 50.0	<50.0	2	8.91 50.0	\$50.0	=	4.70 50.0	<50.0	2	0.00				<u></u>						. ;		:	
	, son [1 to 5 50.0	<50.0	3	8,81 50.0	<50.0	₽	4,78 50.0	<50,0	<b>-</b>	6,31 50,0	Q.02		10.5	20.03	<50.0 U	12.8	200	<50.0 U	. 7 18	200	\$20°0	529	⊋ : 27 :
Schröderer Nept. S				8 of 56.0	: 	, 5	1.70 50.0	~ \$0.0	)	6.31 50.0	\$80	n	10.5	50.0	<50.0 U	12.8	50.0	<50.0	1.18	20.0	<50.0	828 . U	0.08
SJH20-REF Rop. 4	0 103					. =		<50.0	2	6,31 50.0	· 68	ם	10,5	50.0	<50.0 U	1 12.8	50.0	-50.0 U	7,18	50.0	<50.0	U 6.26	6 50.0
SJH20-REF Rep. 5	<50,0 U 10.5 50.0	n'ney				, }	1				ç			T	12.8		) 	138		-	5.26		
SJH20-REF Mean	10.5	8.91			4.70			831			3	}				ı	+	ł	i		200	90 8 11	20.00
Pre-exposure Rep. 1	<50.0 U 10,5 50.0	0'05>	л	8,91 50.0	0.03>	Þ	4,70 50.0	<50.0	⊋	6,31 50.0	- 450.0	T								D 6	700		
Pre-exposure Rep. 2	0.05 ± 10.5 50.0	<50.0	5	8,91 50.0	0.05>	=	4,70 50.0	₹9.0	>	6.31 50.0	<50.0	¬	10.5	20.0		12,8	-			200	700		
Dea evacuate Ren 3	<50.0 U 10.5 50.0	<50,0	Þ	8,91 50.0	0 <50.0	5	4.70 50.0	<50.0	ם	6.31 50.0	<50.0	. ·	10.5	20.0	SD,0	0 12.8	50.0	<50.0	U 7.18	98	<50,B	o eza	O de
Pre-exposure Mean		8.91		L.	4.7			6.31			10.5			-	12.8			7.18			6.26		
< 新報告 The analyte was not detected (ND) at or above the MDL. The value facticates the MRL.	scied (ND) at or above the MDL	The value	faofcales	s the MRL.				, the	Inharolan	for calculat	ino avera	20100 eo	entrations a	'nd total F	AHs.)								
Non-detect (ND) results use the MDL for celculating average concentrations and total PAHs. (Juqualized results use the value reported by the celculating average concentrations and total PAHs. (Juqualized results)	ADL for celculating average con	centrations	and fotal	PAHS. (J-que suldance Man	unied resu val (2016).	Is use the	indo inne	21 67 73				,											
re. Low Molecular Weight PArts are relationed in Appendix B of the EPA Region 2 Guidance Part High Molecular Weight PAHs are referenced in Appendix B of the EPA Region 2 Guidance	are referenced in Appendix B o	of the EPA I	Region 2 (	Guidance Mac	3anual (2015)	عد		٠															
Acconyms and qualifiers are dofined at the front of the tables section.	and at the front of the tables sect	gon,																					
of agontsead bases to the	enimer Inc. FPA Region 2 Guidance Manuel (2018)	nual (2018)	_																				

Sources: Analytical Resources, Inc.; EPA Region 2 Guidance Manual (2018) Compiled by, ANAMAR Environmental Consulting, Inc.



Analytical Results for Wet Weight PAHs in Alitta virens Tissues TABLE 24

																							11.70					
								i	wa	water		Flacing	Fluorenelmir	eranija Postaji Postaji	ndenof	23-00	Indeno(1,2,3-cd)pyrene <sup>(234)</sup>		Naphi	Naphthalene <sup>cav</sup>	2	Phe	Phenanthrene Lw	) j		Pyrene Inter	ž	
Analyte:	Ü	Chrysene	Pierw	전 전 전 전	nzo(a)	n) antitr	Dibenzo(a,h)anthracene	1	Talling.			1				2000		整		金属の	100			<b>高温度</b>	機能	· ·		
	Result all lot	1511110			isliler isliler			Result	Talillau		Result	aghilau		i i	Result	Tallifaut E	NON	RRL Re	Result polkq	Zualifler	MRI	Result Hglkg	Qualifier	NOE MRL	Result L pg/kg	elillauD	MOL ?	S S S
3.	ug/kg d	22	٠.	Τ.	9		HR.	Digital See	- 1	- 1	-	- اد	1	+		.	ļ	1	1	U 12.8	50.0	<50.0	U 7.	7.18 50.0	0 <50.0	ם כ	6.26	50.0
NEWWO20-5-Comp Rep. 1	1 0.02	∓ ⊃	:	•	a .			3					,	9	<50.0	2	10.5 5(	. ₹ 50.0	<50.0 L	U 12,8	50.0	<50.0	. n	7.18 50.0	. <60.0	. =	5,26	. 0.0
NEWWO20-5-Comp Rep. 2	. 0.02>	¥. ⊐	10.5 50.0	0,025 0	o •	60		0.00						9	ş			<u> </u>	50.0	U \$2.8	50.0	<50.0	⊃	7,18 50.0	0.05> 0	<b>5</b>	5.25	50.0
NEWWO20-5-Comp Rep. 3	- 6.02>	ت 5	10.5 50.0	0.05>	<b>⊃</b>	8,91	50.0	0,0 0,0					70	D 1								650	=	7.18 50.0	250.0	5	6.28	50.0
NEWWO20-5-Сопр Rep. 4	0.025	⇒.	10,5 50.0	0.05>	 	8,91	50.0	<del>8</del>			·		6.31	9	o'nes				•		•	250.0	=			<b>_</b>	6.26	50.0
NEWWO20-5-Comp Rep. 5	<50.0	7	10.5 50.0	0.05> 0.0	р 9	8.91	50.0	<50.0	٠,	4.70 50.0	0,03>	2	5.31	20.0	C.065	- -	6.05	7.00	- 1	- 1			,	1.			- [ ]	T
MEMMORA-S-Como Moan	10.5			8,91	ļ .	  -  -		4.70			6.31			•	10.5				12.8	-		7. 22.			6.26	7.7		
				100				: 8		-	. 2				100			<del></del>	£09			100	Į		홀			
% of Reterence	1		000	<u> </u>	=   =	848	50.0	0.05	2	4,70 50.0	0.50.0	ב	6.31	50,0	<50.0	n 1	10.5 5	50.0	<50.0	U 12.8	50.0	<50.0	n	7.18 50.0	0.05> 0.0	٦	6.26	20.0
SJH20-REF Rep. 1	ສຸກຂຸ	•							=	92.5	750.0	=	63	50.0	<60,0		10.5 5	. 2005	<50.0	U 12.8	. 50.0	<50.0	<b>-</b>	7.18 50,0	0,02> 0.	n o	8,26	5.03
SJH20-REF Rep. 2	₹0.0	<del>~</del>	10.5 50.0	0.052	• • :	8,91	nne .	2007					}			, :	•			÷	202	Ş	-	7 58 50.0	2000		6.26	50.0
SJH20-REF Rep. 3	<50.0	7	10,5 50.0	0.02> 0.0	U 0.	1 8,91	1 50.0	<50.0	J .	4,70 50.0	0 <50.0		8.33	200	. <50.0	> ·	e	v :		- 1			1	ŗ	<del></del> -			
S.H20-REF Rep. 4	250.0		10.5 50.0	.0 <50.0	Q;	8.91	50.0	0.085	2	4.70 50.0	0.06>	<b>5</b>	6.31	50.0	450.0	<b>5</b>	10.5	0.08	<50.0	U 12.8	3 50,0	200	=				6.26	2
SJHZO-REF Rep. 6	<50.0	- -	10.5 50	50.0 <50.0	D.	0,91	1 50.0	<50.0	4	4,70 50,0	0 <50.0	_	6.31	50.0	<50.0	ח	10.5	50.0	50.0	U 12.8	3 50.0	<50.0	<b>5</b>	7.18 50	50.0 <50.0	<b>n</b>	6.26	000
C 1470, PFF Mean	10.5			18.8	r.			\$	-		6.31		:		10.5				12,8			7,18			626		:	
7	ļ	=	10.5 50	50.0	000	8.91	\$ 50.0	\$50.0	٦	4,70 50.0	0.08> 0.	2	6,31	50.0	<50.0	<b>-</b>	10.5	50.0	<50.0	U 12.8	8 50.0	- -	⊐	7,18 50	50,0 <50,0	o.	6.26	20.0
Pre-exposure Rep. 1					7 POS>			<50.0	⊃	4.70 50.0	0.08>	ے	5,31	50.0	50.0	p	10.5	20.0	<50.0	U 12.8	50.0	<60.0	⊃	7.18 50	50.0 <50.0	۵ 0	6,26	50.0
Pre-exposure Rep. 2								<50.0	=	4.70 50.0	0.05>	⊃ e	6,31	50.0	<50.0	n	10.5	50.0	<50.0	U 12.8	8 50.0	<50.0	⊃	7,18 50	50.0 <50.0	n 0,	6,26	50.0
Pre-exposure Rep. 3	ones	5	0 cm	7		-1	1			Į٠.	1				10.5			-	12.8			7.18			6.26			***
Pre-exposure Mean	10.5		:	8,91	<u>6</u>			4.70		`	3		1					-										1
				ole of each	All and the state of the	- Indian	e civiletenth clocificative of	ler than that of the reference Essues and at least two replicate results are greater than the MDL.	f the refe	rence 555	ges and at	l least h	o replicat	te results :	are greak	er than th	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1											

Bolded values indicale that the mean concentration of project Essues is statistically stpaticanly greater than that of the reference Essues and at the 454 = The analyte was not detected (ND) at or above the MDL. The value indicates the MRL.

Non-detect (NID) results use the MDL for calculating average concentrations and total PAHs. (A qualified resofts use the value reported by the laboratory for calculating average concentrations and total PAHs.)

Luw, Lovy Mojecujar Vkright PAHs are referenced in Appendix B of the EPA Region 2 Guidance Manua (2016).
New High Mateustar Weight PAHs are referenced in Appendix B of the EPA Region 2 Guidance Manual (2016).
Acrosyms and qualifiers are defined at the front of the labbas section.

Sources: Analytical Resources, Inc.; EPA Regian 2 Guidance Manual (2016) Compiled by: ANAMAR Environmental Consulting, Inc.



TABLE 25 Analytical Results for Dry Weight PAHs in *Macoma nasula* Tissues

			anu.					WATH			Will sens the contract		The second second	Filovene	3		Indeno(1.2,3-cd)pyrene Huvv	13.00	yrene		Naphi	Naphthalenbum	<b>1</b>	F.	enant	Phenanthrene LW	3		Pyrene <sup>MbV</sup>	MINO	
Analyte:	Res	Telfilsu	18		Ulbernzoj Result	relitieu)	WO.	9	₽ 2	Tenlisuc	IQN	Samuel S	Result ualka	Tellilisu Z		MRL 75	Result Tigkg	IGN	<b>5</b>	Artes and Artes	Result	Qualifier MDL	L MRC	Result µg/kg	Qualifler	TGW TGW	MRE	Result pg/kg	Qualities	MDI. 1	M.R.
Sample-Replicate # NEWAWO20-5-Comp Rep. 1	284 284	<b>5</b> ⊃	888 X		19, LP	<i>:</i>	808	385	35.7	j ¬	· i		284	-	36.0 28	285 <2	<284 U	J 58.8	ļ '	285	<264 U	U 72.9	3 285	-284 	=	40.9	285	46.3	¬ .	35.7	582
NEWWO20-5-Comp Rep. 2		⇒	60.6	 588	<288	n	51.4	288	39.9	~	27.1	288	<268	⊃	36.4 21	- V 	<288 U	8		288	7 :	U 73.8	388	~288 ~	<b>a</b>	41.4	288	44.1	٠.	36.1	588
NEWWO28-5-Comp Rep. 3	\$2 \$28	. <del>.</del>	50,1	286	. 588 7588	, , ,	51.0	286	34.2	~	26.9	286	<b>286</b>	5	36.1 2	288	286	U 60.1		286	<285 1	U 73.3	3 286	<286	⊃	£.	286	513	7	35,9	286
NEWWO20-5-Comp Rep. 4	282 282	Ð	58.4		<282	⊃	50,4	283	33.8	7	26.6	283	<282	ກ ວ	35,7 2	- 7 	<282 L	U 59.4		283	-282 L	U 72.4	4 283	<282	⊐ :	4D,6	283	48.9	<b>"</b>	35.4	283
NEWWO20-5-Comp Rep. 5	. 85	<u>}</u> =	63.8	Š	<303	. 5	54.1	304	32.6	. "	28.6	Š	303	. ຕ ⊐	38,3	304	<303 1	U 83.		304 <	<303 1	U 77.8	304	\$303	ລ	43.6	304	42.8	<u>.,</u>	38.0	304
SJH20-REF Rep. 1	29.	2	61.2	ä	4291	=	51.3	291	4294	ם	27.4	281	291	ς Ω	36.8 2	7531	∠291 L	U 61.2		291	<291	U 74.6	6 291	<u>\$</u>	⊃	41.8	291	29	 5	38.5	291
S.IH20-REF Rep. 2	<273	>	57.3	273	<273	ə	48.5	273	c273	. ⇒	25.7	273	<273	<sub>ອ</sub>	34,4 2	273	1 822	U 57.3		273	c273	D 69.9	9 273	<273	<b>¬</b>	39.2	273	<273	<b>D</b>	34,2	273
SJH20-REF Rep. 3	288	. >	20.7	289		⊃	51.5	. 388	<b>4289</b>	Þ	27.2	289	4289	<u>~</u>	36.5 2	 589 	<289	U 60.7			<289 (	U 74.0	.0 289	<289 	<b>&gt;</b>	41.5	289	<289	5	36.2	289
S.H20-REF Rep. 4	. ~277	Þ	58.3	277	<277	n	49.4	277	<277	=	26,1	772	czn	2	35.0 2	277	1 (1%)	U 58,3	:	277	477 (	U 71.0	0 277	772>	<b>5</b>	39.8	277	- 277	5	34.7	277
SJH20-REF Rep. 5	- 4287	د ٔ	. 60.3	287	<2.87	n	51.1	287	Z887	, <u>, , , , , , , , , , , , , , , , , , </u>	27.0	287	<287	ב	36.2 2	787	<287	U 60.3		_	<287	U 73.5	5 287	Z87	<b>~</b>	41.2	287	287	>	35.9	287
Pre-exposure Rep. 1	275	⇒	2.73	275	<275	ב	49.0	275	27.5	ם :	25.8	275	<275	<u>,,</u>	34.7	275	. 275	U 57	57.7 2	275	<275 ·	U 70.3	.3 275	<275	ລ່	39.5	275	<275	<b>5</b>	34.4	275
Pre-exposure Rep. 2	278	Þ	58.4	278	<278		49.5	278	<278	<b>-</b>	26.1	278	<278	 ⊃	35.1	278	<278	1 58 1	58,4	278	278	U 71.2	.2 278	₹778	<b>5</b>	6 6 7	278	2778	⊃ <sup>.</sup>	87.8	278
Pre-exposure Rep. 3	. 22	<u>.</u>	56.3	27.1	<271	֝ ֖֖֖֖֖֖֖֖֖֖֖֖֖֖֖֖	48.3	27.1	<271	_	25.5	27.1	172	ם	34.2	27.1	471	SS □	56.9	27.1	271	U 69,4	4 271	427	<b>&gt;</b>	38.9	27	27.4	<b>-</b>	33.9	2
			1 1 1 C - 1 2 6 6 5 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		448																										

Acronyms and qualifiers are defined at the front of the tables section.

Law Molecular Weight PAHs are referenced in Appendix B of the EPA Region 2 Guidance Manual (2016).

ням High Molecular Weight PAHs are referenced in Appendix B of the EPA Region 2 Guidance Manual (2016).

Spurces, Analytical Resources, Inc.; EPA Region 2 Guidance Manual (2016)



TABLE 26 Analytical Results for Dry Weight PAHs in Allta virons Tissues

עוומול וישיו וומחום אווים וועיולומווע	,											-				-		-					400000000000000000000000000000000000000		March Control	No. 10	Section 1	2
										400		M1			Indeport 2 3-editorene	Jedon Je	Tene III		Naphthalene Law	ج او		Рhела	Phenanthrene	nn,	<b>L</b>	Pyrene Hurv	3	errini.
Analyte:		Chrysene Inw	- IDAM	Dibenzo(a,h)anthracene	(a,h)ant	hracen		Fluora	Fluoranthene		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	aion)	1			100	1000000		150.00	THE STATE OF	華田		研究	海海				<i>3</i> 12
	Resulf	tellis.	Result in	Result	កeពិវិន្នៃប	1e]]fisu			Tallileu Z		Result	19lillau)		ž š	Result	Qualifler NO	SI MRL	Result L 119/kg	ieffilsu <b>O</b>	MDL !	MRL P	Resuft pg/kg	Guallfie M M M	MRL	Result	Qualifle	MDLM	Ř
Sample-Replicate #	rig/Kg	z O	DI MR	E piglkg	Đ	NO.	<u></u>	(F)	5	2	200	s :	. 1	4-	1	1	74.8 356		⊃ 92	91.2	356	4356	U 51.1	356	355	⊃ 4	44.6 3	356
NEWWO20-5-Comp Rep. 1	355	⊋	74.8 356	<356	<u>&gt;</u>	63,5	356	4356	33.5	900	900	5			}				=	. 0	· · ·	ş	11	340	· 6	. 1	42.6 3	340
NEWWO20-5-Comp Rep. 2	\$	=	71.4 340	<340	⊋	9.09	950	<340	U 32.0	340	340	, D	42.9	~ 동	<340	∑ ⊃	71,4 340					1						. 8
NEWARKON-F.Comp Rep. 3	23	⊃	68.2 330		Þ	58.7	330	<330	U 31.0	330	930	5	41.8	330	<330	C 28	69.2 330	8	o 20	84.4	330	<b>4330</b>	ت در 4	200	3			3
Newwycze-Company		=	710 338		⊐	60,3	338	<338	U 31.8	338	<33B	` =	42.7	338	<338	17	71.0 338	8 <338	38 38	86,6	338	<33B	U 48.6	88 .	338	<b>→</b>	42.4 3	338
NEW WOZU-5-COMP Rep. 4		=			. =	51.0		: 245	U 32.2	342	<342	· ::	43,2	342	<342	u 71	71,9 342		<342 · U	87.7	342	<342	U 49.2	2 342	<342	_ D	42.9 3	342
NEWWOZ0-5-Comp kep. 5	ž,	- }	1	_	.			0.00	200	355	å,	=	9 44	95	<356	U 77	74.7 356		C356 U	91.0	356	<356	U 51.1	1 356	<355	) 4	44.5	356
SJH20-REF Rep. 1	~35g	₽	74.7 356	<356	>	63.4		900	Š		}	•					6		11	К	338	C338	U 48.5	5 338	. 85 338	2	42.3	338
SJH20-REF Rep. 2	4338	5	71.0 338	4338	ב	60.2	88	338	u 31.8	338	8 8 8 8 8 8 8 8	<b>&gt;</b>	42.7	 	855	a	3.				}							
e iuon per gen 3		⊋	71.0 338	- S338	Э	60.2	338	<338	U 31.8	338	2338 8	⊃	42.7	338	<338	D 7	71.0 33	88 	-338 U	86.5	338	<338	1 48.5	338	<u> </u>	, >		9
	, ,	-	74.3 340	<340	<b>-</b>	60.5	340	<340	U 31.9	9 340	\$6 8	⇒	42.9	340	<340	7	71.3 34		340	87,0	340	<340	U 48,8	340	§ :	, . D :	42.5	· 30
SOHZU-KET Kep. 4	. 8	່ລ			5	57.9	325	<325	 U 30.5	5 325	<b>432</b>	9	41.0	325	<325	. % 	68.2 32	325 <3	<325 U	83.2	325	<325	U 45.7	7 325	4325	ח	40.7	325
מסשקת-אבו אפורים		=	- 1	240	=	56.8	319	916	U 30.0	0.319	319	ם	40,2	319	<319		67.0 31	319 <3	<319 U	81.6	319	6355	U 45.8	8 319	<u>8</u>	⊃	39.9	319
Pre-exposure Rep. 1	<u>.</u>			<u> </u>		7	323	· 323	30.3	. 323	<323	5	40.7	323	<323	. <b>.</b>	67.8 33	323	<323 U	82.6	323	333	U 46.4	4 323	<323	⇒ :	40.4	323
Pre-exposure Rep. 2	S	·		<u>.</u> :				. 9	. 1	938		22	42.4	. 98	336	7	70.6	. V 	336 U	86.1	336	<338	U 48.3	3 336	4336	>	42.1	338
Pre-exposure Rep. 3	238	<b>-</b>	70.6 33	336 <336	ے ا	58.9	ass	955	ļ	E				-				-			1							
			and the define another	arjiva a																								

Accoryms and qualifiers are defined at the front of the tables section.

< ### = The analyte was not detected (ND) at or above the MDL. The value indicates the MRL.

Law Molecular Weight PAHs are referenced in Appendix B of the EPA Region 2 Guidance Manual (2018).

Harry High Molecular Weight PAHs are referenced in Appendix B of the EPA Region 2 Guidance Manual (2016).

Sources: Analytical Resources, Inc.; EPA Region 2 Guidance Manual (2016)



TABLE 27 Analytical Results for Wet Weight PCBs In Macoma nasuta Tissues

					g/8478	PCB 138	PCB153
Analoge	PCB 87	PCB101	PCB-105			O CHARLES AND A CONTROL OF THE CONTR	
Î	100 to	),16	Į <b>e</b> į			ilijėk.	ilfler
	Result a	Result a	llen	Result a	Result a MDL MRL	HESUIL ME MDL MRE	HEIRE OF MOL MRL
Sample-Replicate #	N.	HORG OF NOL MRE	O MUL. MAL.	070	1 0.40	0,49 - 0.40 0.40	0.79 - 0.40 0.40
NEWWOZ0-5-Comp Rep. 1	<0.40 U 0.40 0.40	0,62 - 0,40	D D.40	ر د ور د ور	11 0138	0.53 - 0.38 0.38	880
NEWWO20-5-Comp Rep. 2	<0.38 U 0.38 0.38	0.69 - 0.38	0.38	ŧ	070 070 11 070	- 0.40	0,94 - 0,40 0,40
NEWWOZO-5-Comp Rep. 3	<0.40 U 0.40 0.40	0.73 - 0.40 0.40	<0.40 U 0.40 0.40	1		0.40	1 0.40
NEWWORD-5-Comp Rep. 4	: ⊃	0.72 - 0.40 0.40	<0.40 U 0.40 0.40	0,40	Q (4		1
KICKANOL SCOTT	<0.40 U 0.40 0.40	0,69 - 0,40	<0.40 U 0.40 0.40	0.44 - 0.40 0.40	<0.40 U 0.40 U.40	080	
a day dispersion and an analysis	OF C	69.0	0.40	0.44	0.40	0.54	607
NEWWO20-5-Comp Mean	0.40		8	111	86	134	
% of Reference	66	11.5	1	Ch. do 11 0.40 0.40	<0.40 U 0.40 0.4B	<0.40 U 0.40 0.40	*<0,40 U 0,40 0.40
SJH20-REF Rep. 1	<0.40 U 0.40 0.40	<0.40 U 0.40	2 : 3 :	080	<0.40 10 0.40 0.40	<0.40 U 0.40 0.40	*<0.40 U 0.40 O
SJH20-REF Rep. 2	<0.40 U 0.40 0.40	<0.40 U 0.40	0 0,40		LJ 0.40	   <0.40 U 0.40 0.40	*<0,40 U 0,40 0.40
SJH20-REF Rep. 3	<0.40 U 0.40 0.40	<0.40 U 0.40	0,40	2 2	1 0.40	<0.40 U 0.40 0.40	*<0.40 U 0.40 0.40
SJH20-REF Rep. 4	<0.40 U 0.40 0.40	<0.40 U 0.40	3 6	2 6	11 0.40	<0.40 U 0.40 0.40	*<0.40 U 0.40 0.40
SJH20.REF Rep. 5	<0.40 U 0.40 0.40		0.40 U U.40	,		0,40	0.40
SJH20-REF Mean	0,40	-		07 07 07 07 07 07 07 07 07 07 07 07 07 0	<0.40 U 0.40 0.40	<0.40 U 0.40 0.40	*<0,40 U 0,40 0.40
Pre-exposure Rep. 1	<0.40 U 0.40 0.40	<0.40 U 0.40	o :	2 2	. 040	<0.40 13 0.40 0.40	-<0.40 U 0.40
Pre-exposure Rep. 2	U 0,40	<0.40 U 0.40	Q (4)	0.00	<0.40 U 0.40	<0.40 U 0.40 0.40	*<0,40 U 0,40 0.40
Pre-exposure Rep. 3	<0.40 U 0.40 0.40		200		┿	0.40	0.40
Pre-exposure Mean	0.40	0,40	0.40		× ;;	×	×
Por Antion love!	·	·	×	×	<		· · · · · · · · · · · · · · · · · · ·



TABLE 28 Analytical Results for Wet Weight PCBs in Alitta virens Tissues

<u> </u>	Total EPA Region					3	0 7 0			PCB 28			Ş	PCB:44			PCB'49			PCB 52	52			PCB 66	
Analyte: 2 PCBs	PCES		PCB S3			2	2010		Name of the last			11,500		0.117.7		特別が		が設め	がある。	歴史学					
			Jail			Təlî				Telt[	la George Egener		19][[]		ρ	- D11.	ielīi!		Result	≓ ielflis		8	ज्ञाधिक अधिक		
	Result	Result usi	nen		Rest	lent ₩.	Š	ğ	Result :	TOM:	MR			MDL	MRL	rigikg C	MOL.	L MRL		On	MDL	MRL PS	pg/kg d	MDE	MRI
Sample-Replicate #		Na Maria	2	2002 - T			5			0 40		\$ <0.40	מ	0.40	0.40	0.64	0.40	0.40	0.36	ı	0,40 (	0.40	<0.40 L	0.40	0.40
<u>:</u>	53.	9.40	0 .		2 6		2 0	2 6		680			<u></u>	0.39	98'0	0.75	0.39	9 0.39	9 1.14	,	0.39		<0,39 t	0.39	;
NEWWO20-5-Comp Rep. 2	4	- 56.05	850				n 6	3 8					ت د	0.40	0.40	. 690	- 0.40	0 0.40	0 1.03	ı	0.40	0,40	c0,40	0.40	0.40
NEWWO20-5-Comp Rep. 3	13.2	<0.40	0.40				2 5	2 5					<b>□</b>	0.40	0,40	0.72	0.40	0 0.40	0 1.05	ı,	0.40	0.40	0,40	0.40	0.40
NEWWO20-5-Comp Rep. 4	13.8	<0.40	0.40				2 6	2 6					. to	0,39	0.39	0.80	0.39	. 60,39	1.18	1	0,39	0.39	<0.39	0,39	0.39
NEWWO20-5-Comp Rep. 5	15.2	<0.39	0.39	6 0,39			50.03	U.35		1		╁	İ			0.72			1.07	_		-	ę		
NEWWO20-5-Comp Mean	13.8	0.40			- 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0	~			6.44			<u> </u>	_			000			268				66	, ž	
% of Reference	122	66			. 236	"			198	-	-	3	ļ		1	3		1	╌├╴	-	970	9,0	0,00	07.0	
A TELES DEED OF A	11.8	<0.80	U 0,40	0.80	0 <0.40	0	0,40	0,40	<0.40	U 0.40	3 0.40	0,40	⊐ a	0,40	0.40	<b>6</b> .46	D	0.40	÷	3 : 2 :	2				
The Taylor	,		000	080	-0 40		0.40	0.40	÷0.40	U 0.40	0.40	0 <0.40	50	0,40	0.40	<0.40	U 0.4		09.00	9 9	0,40	~ 양 	0 <del>4</del> :	0.40	
SJHZ0-KEF Kep. Z	<u>.</u>	000	5 6		<u> </u>	. =	. 070	0.40	- O 40	0.40	0.40	0 <0.40	<u></u>	0,40	0.40	<0,40	U 0.40	10 0,40	10   <0.40	10 11	0.40	0,40	<0.40	0.40	
SJHZ0-REF Rep. 3	3::	<b>3</b>	) (1)		-	) = 2	, ,	. 6	: C	11 0.40		••••	ت 9	0,40	0.40	<0.40	U 0.40	0.40	10 <0,40	10 CE	0,40	0.40	<0,40	1 0.40	0,40
SJH20-REF Rep. 4	10.8				2 · 4				4	070			: ≘	0.40	0.40	<0.40	U 0.40	10 0.40	40 40	do O	0.40	0.46	<0.40	0.40	
SJHZO-REF Rep. 5	11.5	_	U 0.40	0.00		2 9	2	3	9		ŀ	+				0,40			0 0	0			0.40		
SJH20-REF Mean	113	- 1	-			•			5 6	070	09.0	+-	2	0.40	0.40	<0.48	U 0,40	10 0.40	10 <0.40	D 65	0.40	0,40	0,40	3 0.40	0,40
Pre-exposure Rep. 1	10.6	8. 8.	U 0,40		-		17-11	- C	2 5					040	0.40		11 0.40	10 0.40	_	<b>5</b>	0.40	0.40	<0.40	U 0.40	0.40
Pre-exposure Rep. 2	9.18	6, 8,	U 0.40	0.80	-		0,40	0.40	0,40						2				_	10 07	0.40	0.40		U 0.40	0,40
Pre-exposure Rep. 3	8.80	<0.80	U 0.40	08.0	-+	용 그	9,40	0.40	<0.40	0.40	0.40	-	3	2	3	9	1	1	+	1		10	0.40		
Pre-exposure Mean	10.4	0.40	: -	: ·   	0.40	္ဌ			0.40					-	T	;			*			1	×		
CDA Actino Level	2000	×			×				×			×				K						-			-



Analytical Results for Wet Weight PCBs in Ailta virens Tissues TABLE 28

	0000470	P. P. P. P. P. P. P. P. P. P. P. P. P. P	PCB-183	PCB 184	PCB 187	PCB195	PCB:208		PCB 209	
Analyte	A LOS TORES	200 000		3,7,55,7,7	STATE OF THE PARTY					
			10	10	<b>19</b> ]	   [et	(əi)		1 <b>0</b> []	uet Geo
	911		Doc.07	Result	Result in	ije.	Result a	Result		
	Result a single aton	Result of Mol Mol Mel	udika Pa MDL MRL	ugikg & MOL MRL		µg/kg	nglkg	ngrkg	MOE	MRL
. ]	OVO OVO II OVO	1	<0.40 U 0.40 0.40	<0.40 U 0.40 0.40	0.52 - 0,40 0.40	10 <0.40 U 0.40 0.40	0 <0.40 U 0.40 0.40	0.40 40		0.40
NEWWOZU-5-Comp Kep. 1	50,40 U.40 U.40	0.75	Ġ	<0,39 U 0,38 0.39	0.82 - 0.39 0.39	S <0.39 U 0.38 0.39	18 <0.39 U 0.39 0.39	0 <0.39	0.39	0.39
NEWWOZU-5-Comp Kep. 2		2 0	-	<0.40 U 0.40 0.40	6.70 - 5.40 0.40	10 <0.40 U 0.40 0.40	10 <0.40 U 0.40 0.40	<0.40	U 0.40	0,40
NEWWO20-5-Comp Rep. 3	< < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < < > 0.40 < <	0,03 1 0,45	1 0.40	⊃	0.70 - 0.40 0.40	10 <0.40 U 0.40 0.40	10 <0.40 U 0.40 0.40	<0.40	U 0.40	0,40
NEWWO20-5-Comp Rep. 4	< <0.40 U.90 0.40 0.40	0.00 m 25.0	65.0	⊃	0.85 - 0.39 0.39	39 <0.39 U 0.39 0.39	19 <0.39 U 0.39 0.39	<0,39	Į	0.39
NEWWO20-5-Comp Rep. 5	200	200		0.40	0.72	0.40	0.40	0,40		
NEWWO20-5-Comp Mean	0.40	qo'n	2. 6	g.	4	. 68	68	66		*
% of Reference		\$	ı	070 070 11 0707	0.70 - 0.40	0.40 <0.40 U 0.40 0.40	to <0.40 U 0.40 0.40	<0,40	U 0.40	0.40
SJH20-REF Rep. 1	<0.40 U 0.40 0.40	0.60 0.40		9 2	0.64 - 0.40	0.40 C.40 U 0.40 0.40	40 <6.40 U 0.40 0.40	-0.40 -	U 0.40	0.40
SJH20-REF Rep. 2		0.48 - 0.40	0.40		0.58 - 0.40	<0.40 U	40 <0.40 U 0.40 0.40	0 <0.40	U 0.40	0.40
SJH20-REF Rep. 3	<0.40 U 0.40 0.40	0.44 - 0.40	0 · 1		: 0	ch 40	<u> </u>	0 <0.40	U 0.40	0.40
SJH20-REF Rep. 4	<0.40 U 0.40 0.40	0.41 - 0.40	040		2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2	<0.00		<0,40	U 0,40	0.40
SJH20-REF Rep. 5	<0.40 U 0.40 0.40	4	CO.40 U 0.40 U.40	I	0.63	0.40	0,40	0.40	1	177
SJH20-REF Mean	0.40			=	0.50 0.40	040 St 0.40 0.40	40 <0.40 U 0,40 0,40	<0.40	U 0,40	0.40
Pre-exposure Rep. 1	<0.40 U 0.40 0.40	0,44	0.40	7670	0,0 0,0	20 40 11 10 40	<0.40	<0.40	U 0.40	0.40
Pre-exposure Rep. 2	<0,40 U 0.40 0.40	0,47 - 0,46 0,40	<0.40 U 0.40 0.40	0.40	0.04	OF 0 - 1	45 6			040
Pre-exposure Rep. 3	<0.40 13 0.40 0,40	-0.40 U 0.40 0.40	<0,40 U 0,40 0.40	<0,40 U 0.40 0.40	0.48 - 0.40	0.40	250	-	11.7	:
Pre-oxposure Mean	0.40	0.44	0.40	0,40	: 0.51	U.AU		-	-	T
FDA Action Level	×	×	×	×	×	×		4		-
		10 mm	and the fact than the of the		ast two replicate results a	re greater than the MDL				

Bolded values indicate that the mean concentration of project tissues is statistically significantly greater than that of the reference tissues and at least two replicate results are greater than the MDL.

< #### = The analyte was not detected (ND) at or above the MDL. The value indicates the MRL.

Non-Detect (ND) results use the MDL for ratioualing total EPA Region 2 PCBs. (4-qualified results use the value reported by the laboratory for calculating total EPA Region 2 PCBs.)

\*Sample was tested for analyte PCB-132/153.

Acronyms and gualifiers are defined at the front of the tables section.

Sources: Analytical Resources, Inc.; FDA action levels from FDA (2001, 2011); EPA Region 2 Guidance Manual (2016) Compiled by: ANAMAR Environmanial Consulting, Inc.



TABLE 29 Analytical Results for Dry Weight PCBs in *Macoma nasula* Tissues

MDE   MRE   Result			<u>.</u>	PCB 105	多等級		PCB 118	118			PCB 128	8		4	PCB 138			J.	PCB 153	
-2.26         U         2.78         2.28         3.58         -           -2.26         U         2.79         2.79         4.78         -           -2.26         U         2.26         2.25         4.78         -           -2.26         U         2.26         2.26         4.77         -           -2.28         U         2.26         2.26         4.07         -           -2.28         U         2.43         4.19         -           -2.33         U         2.33         2.33         U           -2.31         U         2.31         2.31         U           -2.22         U         2.22         2.22         0	APPEN HER SET	Z Z	Result Joshan Qualifiet	MDL	MRL	Result	neilleu D	M TOW	MRL	Result ugikg	ie∄lisuΩ ≅	MDE MRE		Result die ugikg G	Igg	MRL	Result L µg/kg	= Cousilfier	MDE	MRC
<2.19         U         2.19         2.19         3.98            <2.29         U         2.29         2.29         4.18            <2.26         U         2.26         2.26         4.07            <2.43         U         2.43         2.43         4.19            <2.33         U         2.33         2.33         2.33         U           <2.18         U         2.31         2.31         2.31         U           <2.22         U         2.22         2.22         0			1	2.28	2.28	2.28	1 .	2.28 2	2.28	<2.28	D .	2.28 2.28		2.79	2.28	3 2.28	3 4.50	l	2,28	2.28
3 Rep. 3     <2.29     U     2.29     2.29     4.18        3 Rep. 4     <2.26     U     2.26     2.26     4.07        5 Rep. 5     <2.24     U     2.43     2.43     4.19        5 Rep. 5     <2.24     U     2.43     2.43     4.19        6 2.33     U     2.33     2.33     2.34     2.31     U       6 2.31     U     2.31     2.31     2.31     U       6 2.22     U     2.22     2.22     2.22     U	2.19	2.19	- 57.5 O	2.19	2.19	2,60	ı	2.19 2	2.19	<2.19	2	2.19 2.19	<u> </u>	30.6	2.19	2.19	5,13		2.19	2.19
ARep. 4 <226 U 226 226 4.07 ARep. 5 <243 U 2.43 2.43 4.18 <2.33 U 2.33 2.33 2.33 2.33 U 2.18 U 2.18 U 2.18 2.18 C.19 U 2.31 2.31 C.231 U 2.31 2.31 C.222 U 2.22 C.222 U	2.29	2.29	<2.29 U	2.29	2.29	2.69	ι.	229 2	2,29	<229	7	2.29 2.29	<del></del>	3.21	2,29	3 2.29	5.38	1 !	2.29	2.23
2.86 U 2.43 2.43 4.18 2.23 U 2.33 2.33 U 2.24 2.18 2.18 2.18 2.18 U 2.21 U 2.31 2.31 2.31 U 2.31 2.31 2.31 U 2.32 2.22 2.22 U		226	<2.26 U	2,26	2,26	2.60	, .	2.26	2.26	<2.26	U 2.	2.26 2.26		3.17	2.26	2.26	5,26	1 ;	2,26	2.26
-2.33     U     2.33     2.33     2.33     U       -2.18     U     2.18     2.18     -2.18     U       -2.31     U     2.31     2.31     -2.31     U       -2.21     U     2.22     2.22     -2.21     U		2.43	<2.43 U	2.43	2.43	2.67	1	243	2.43	<2.43	U 2,	2.43 2.43		3.28	- 2.43	3 2.43	3 5.47	Į.	2.43	2.43
2.18     U     2.18     2.18     2.18     2.18     U       2.31     U     2.31     2.31     2.31     2.31     U       2.22     U     2.22     2.22     2.22     U	t U 2.33	2.33	<2.33 U	2.33	2,33	2.33	⇒	2.33	2,33	<2,33	23 .	2.33 2.33		233 U	233	3 2.33	33	უ :	2.33	2.33
2,31 U 2,31 2,31 2,31 U 2,22 U 2,22 2,22 C,22 U	3 U 2.18	2.18	- -2.18 U	2.18	2.18	<2.18	ם	2.18	2.18	<2.18	U 2.	2.18 2.18		<2.18 L	U 2.18	8 2.18	\$ 2.18	8	2.18	3 2.18
<2.22 U 2.22 2.22 <2.22 U		231	<2.31 U	2.31	2.31	<2.31	⊃	231	2.31	<2.31	υ 2	2.31 2.31		<2.31 L	U 2.31	1 2.31	1 (-2.31	z D	2.31	2.31
•		222	<2.22 U	2.22	2,22	<2.22	⊃	222	222	<2.22	U :	2.22 2.22		<2.22	U 2.22	2 2.22	2 222	ฎ	2.22	2.22
	0 C 2.30	2.30	<2.30 U	2.30	2.30	<2.30	<b>¬</b>	2,30	2.30	<2.30	U 2.	2.30 2.3	2,30 <	<2.30 L	U 2,30	0 2.30	0 .<2.30	2	2.30	2,30
Pre-exposure Rep. 1 <2.20 U 2.20 2.20 U		2.20	<2.20 U	3 2.20	2.20	<2.20	Ð	2,20	2.20	<2.20		2.20 2.	2.20	<2.20 \	U 2.20	0 2.20	0 <2.20	n ::	2.20	220
Pre-exposure Rep. 2		222	n 225	1 2.22	2.22	42.22	⊃	2.22	222	<b>22,22</b>	. 22	2.22 2.2	222	222	U 2.22	2 2.22	2 222	્ર સ	2.22	2 222
Pre-exposure Rep. 3 <2.17 U 2.17 2.17 <2.17 U		2.17	<2.17 U	1 2.17	2.17	<2.17	ח	2.17	2.17	2.17	U 2	2.17 2.	2.17	<2.17	U 2.17	7 2.17	7 42.17	n 4	2.17	7 2.17



TABLE 30 Analytical Results for Dry Weight PCBs in Allifa virens Tissues

Analyte:		<u> </u> 2	PCB 5/8			FCB 18	18	OEEE		PCB 28	82			PCB 44			I I	PCB 49			PCB 52	52	######################################		PCB 66	99	
Sample-Replicate #	는 Result 편 pg/kg· 경	19Rilsu <b>O</b>	MDI.	MRC	Result in	1ehilsuΩ ∑ ⊡		MRE B	Result pg/kg (	raililisu E	MDL MF	Re MRE µg	Result Rugikg 3	Gow MDL	NRL	Result pg/kg	ca 🛱 Cuslifier	MDL	MRL	Result µg/kg	1ei∏isuΩ ≅	MDL	M K L R	Result µg/kg	1eifilisu D	TQW	Z Z
NEWWO20-5-Comp Rep. 1	<2.85	ח	2.85	2.85	6.84	1 2	2.85	2.85	7.92	1	2.85 2.8	2.85 <2	<2.85 U	1 2,85	2.85	4.58	ı	2,85	2.85	6.84	-	2.86 2	2.85	2,85	" =	2,85	2.85
NEWWO20-5-Comp Rep. 2	53.65	<u>ہ</u> د	2.65	2.65	6.05	- 2		2.65	2.65	1	2.65 2.6	2.65	<2.65 U	1 2.65	3 2.65	5.10	١	2.65	2.65	7.75		2.65 2	2.65	<2.65	٠.`	2.65	2,65
NEWWO20-5-Comp Rep. 3	42.64	⇒	2,64	2. 28.	2,67	κi   .	2.64	2.64	<2.64	2.	2.64 2.6	264 <2	2.62	1 2.64	2.64	4,55	1	2,64	2.64	6.79	. N	'	264	2.64	; `` ;	. 6d	2.64
NEWWO20-5-Comp Rep. 4	271	⊃	2.74	271	6.02	, vi	2,71	2.77	3.11	ri .	2.71 2.71		0 HZ	177	2,74	4.87	. 1 .	2,77	2.7H	7,50	, I	2.71 2	271	274	: `` : ===	277	. 571
NEWWO20-5-Comp Rep. 5	<2.67	n	2.67	2.67	7,60	તો 	2.67	2.67	3.56	. y	2.67 2.67		-2.67 U	2.67	, 2.67	5.48	. 1	2.67	2,67	8.08	: 1	2.67	2.67	- 2.67	- ``	2.67	2.67
SJH20-REF Rep. 1	<5.69	п	2.84	5,69	<2.84	η 2	284 2	2.B4 <	<2.84	U 2.	2.84 2.8	2.84 <2	2.84 U	2.84	2.84	<2.94	. T	2.84	2.84	<2.84	¬	2.84 2	2.84	2.84	ם "	2.84	2.84
SJH20-REF Rep. 2	5,41	<b>&gt;</b>	2.70	5.41	<2.70		2.70	2.70	<2.70	. 2	2.70 2.7	2,70 <2	<2.70 U	1 2.70	2,70	42.70		2,70	2.70	2.70	: " >	2.70 2	2.70	2.70	. " 	2.70	2.70
SJH20-REF Rep. 3	5,41	⊃	2.70	5.41	<2.70	ς 	2.70	2.70	2.70	2.	2.70 2.7	2.70 <2	<2.70 U	2.70	2.70	<2.70	ם	2,70	2.70	<2.70	, 5	2.70 2	270	2.70	,, =	2.70	2.70
SJH20-REF Rep. 4	5.43	۵	2.72	5,43	<2.72	U 2	2.72	2.72	c2.72	.2	2.72 2.7	2.72 <2	<2.72 U	1 2.72	2.72	42.72	2	2.72	2.72	42.72	, ,	2.72 2	2.72	<2.72	<b>⊃</b>	2.72	2.72
SJH20-REF Rep. 5	<5,20	n	2,60	5.20	<2.60	U 2.	2.60 2	2.60	<2.60	U 2	2,60 2.6	2.60	o 09.7⊳	2.60	3,60	8,8	) )	2,50	2.60	<2.60	່ ສ	2,60 2	2.60	-2.80	" 	2.60	2.60
Pre-exposure Rep. 1	<5.10	Λ	2.55	5.10	<2.55	U 2.	2.55 2	2,55	<2.55 (	0 2	2.55 2.55		<2.55 U	1 2.55	, 2.55	<2.55	5 t	2.55	2,55	42,55	5	2.55 2	2,55	2.55	Þ	2,55	2.55
Pre-exposure Rep. 2	<5.16	⊋	2,58	5,16	<2.58		2.58	2,58	<2.58	U 2,	2.58 2.5	2,58	<2.58 U	2.58	2.58	2.58	⊃	2.58	2.58	<2.5B	2	2.58 2	2.58	<2.58	ם "	2.58	2,58
Pre-exposure Rep. 3	\$5.38	>	269	5,38	<2.69	; :>	2.69 2	2,69	(2.69 (	D 23	2.69 2.6	2,69 <2	<2.69 U	2,69	2,69	7.69	ם	2.69	2.69	42,68	U 2	2.69 2	2.69	<2.69	יי ב	2.69	2.69



TABLE 30 Analytical Resulis for Dry Weight PCBs in *Alitta virens* Tissues

Analyte:		PCB 170	0.		PCE	PCB180			PCB 183	33		S A	PCB 184			PCB 187	187			PCB 195	9		PCE	PCB 206			PCB 209	0
Sample-Replicate #	Result Result Result Result Relation Result	YeililsuΩ F	T. MR	Resi L pg/k	ieillsup	MDL	MRL.	ssult. g/kg	Gualliffer Gualliffer MDL	DE NR	Result Result	Ko ka Gusililet	MDL	MR	Result Itg/kg	19jillen Q	MOL	MRL	Result uglikg	nenlisu E Ö	L MRL	Result T. µg/kg	reffilsuQ	MDL	MRC	Result pg/kg	TeillisuQ M	I. MRL
NEWWO20-5-Comp Rep. 1	<2.85	U 2.85	5 2.85	5 3.28	l cc	2.85	2.85	<2.85	1 28	2,85 2,85		<2.85 U	2.85	2.85	3.70	1	2.85	2.85	<2.85	U 2.85	5 2.85		2	2,85	2.85	2.85	U 2.85	5 2.85
NEWWO20-5-Comp Rep. 2	<2,65	U 2.65	. 2.65	5 5.10	ا	2,65	2.65	<2.65	U 2.6	2.65 2.65		<2.65 U	2.65	2.65	5.57	ı	2.65	2.65	<2.65	U 2.65	5 2.65	. 2.65	52 23	2.65	2,65	2.65	U 2.65	5 2.66
NEWWO20-5-Comp Rep. 3	45.54	U 2.64	74 2.64	4 4.55	1	2.64	2.64	25	U 2.64	34 2.64	2.64	% ⊃	2,64	2.64	4.61	1	2.64	2.64	: C	U 2.64	2.64	2 2 2	;⊐	7.64	2.64	26	U 2.64	7 2.64
NEWWO20-5-Comp Rep. 4	27	U 271	1 2.71	1 4,33	l I	2.71	2.71	2.71	U 2.71	71 271	M 42.71	. u . Y.	271	2.71	4,74	ı	2.71	2.71	27.7	U 2.74	1 2.71	7 2.7		2.71	274	42.71	U 2.71	1 271
NEWWO20-5-Comp Rep. 5	<2.57	U 2.67	7 2.67	7 5.21	-	2.67	2.67	<2.67	U 2.67	57 2.67	57 <2.67	10 10 10 10 10 10 10 10 10 10 10 10 10	N	2.67	5.82	1	797	2.67	<2.67	U 2.67	7 2.67	7 2.67	: : ::::::::::::::::::::::::::::::::::	2.67	2.67	<2.67	U 2.67	7 2.67
SJH20-REF Rep. 1	<2.84	U 2.84	14 2.84	4 427	- 2	2.84	2.84	<2.84	U 2.84	34 2.84	34 <2.84	34 U	2.84	2.84	4,98	ş	284	2.84	28.	U 2.84	2.84	4 <2.84	×	25.	2.84	2.84	U 2.84	H 2.84
SJH20-REF Rep. 2	<2.70	U 2.70	0 2.70	0 3.25	1	2.70	2.70	2.70	U 2,70	70 2.70	70 <2.70	D	2,70	2.70	4.33	1	2.70	2.70	2.70	U 2.70	0 2.70	0 <2.70	: - コ - 0	2.70	2.70	<b>2.70</b>	 U 2.70	0 2.70
SJHZ0-REF Rep. 3	<2,70	U 2.70	0 2.70	0 2.97	1	2.70	2.70	270	U 2.70	70 2.70		<2,70 U	2.70	2.70	3.92	1	2.70	2.70	<2.70	U 2.70	0 2.70	0 <2.70	⊃	2,70	2.70	2.70	U 2.70	0 2.70
SJH20-REF Rep. 4	<2.72	U 2.72	2 2.72	2 2.79	} .	2.72	2.72	<2.72	U 2.72	72 2.72	72 <2.72	72 U	2.72	2.72	380	ı	2.72	2.72	27.72	U 2.72	2 2.72	2 <2.72	5	272	272	<2.72	U 2.72	2 2.72
SJH20-REF Rep. 6	<2.60	U 2.60	0 2,60	3,44	. 1	2.60	2.60	<2,60	U 2.60	30 2.60	30 <2.60	90 C	2.60	2,60	4.29	ı	2.60	2,60	2,60	U 2.60	0 2,60	0 <2.60	 0	. 7.60	5.60	· 2.60	U 2.60	0 2.60
Pre-exposure Rep. 1	<2.55	U 2.55	5 2.55	5 2.81	1	2.55	2,55	<2.55	U 2.55	35 2,65	55 <2.55	55 U	2.55	2.55	3.32	1	2.55	2.55	2.55	U 2.55	5 2.55	5 <2.55	Þ	2,55	2.55	2.55	U 2.55	5 2.55
Pre-exposure Rep, 2	2.58	U 2.58	8 2.58	3.03	ŧ	2,58	2.58	<2.58	U 2.58	38 2.58	38 <2.58	n 28	2,58	2.58	3.49	1	2.58	2.58	<2.58	U 2.58	8 2.58	8 <2.58	=>	2.58	2.58	<2.58	U 2,58	8 2.58
Pre-exposure Rep. 3	<2.69 U 2.69	U 2.6	3 2.69		<2.69 U	2.69	2.69	<2.69	U 2.69	39 2.69	2259	⊃ 69	2.69	2,69	3,23	1	2,69	2.69	<2,69	U 2.69	9 2.69	9 <2.69	⇒	2.69	2,69	<2.69	U 2.69	9 2.69
10 th orthodoxinal cultur off 1054 off curds on to (OIA) beloated to a missing the mass of the early of 1054 off	ACTION POLON	40.00	mio tha A	402	or loss of	- Almalae	of the Add	,																				

<## = 1 The analyte was not detected (ND) at or above the MDL. The value indicates the MRL.

\*Sample was tested for analyte PCB-132/153.

Acronyms and qualifiers are defined at the front of the tables section.

Source: Analytical Resources, Inc.