DEQ	WATER RESOURCES DIVISION SURFACE WATER ASSESSMENT SECTION POLICY AND PROCEDURE		DEPARTMENT OF ENVIRONMENTAL QUALITY
Original Effective Date: January 31, 1995 Revised Date: Reformatted Date: May 22, 2014	Subject: Fish Contaminant Monitoring Program – Fish Collection Procedures		Category: ☒ Internal/Administrative ☐ External/Non-Interpretive ☐ External/Interpretive Type: ☐ Policy ☐ Procedure ☒ Policy and Procedure
	Program Name: Surface Water Quality Program		
	Number: WRD-SWAS-004	Page: 1 of 5	

A Department of Environmental Quality (DEQ) Policy and Procedure cannot establish regulatory requirements for parties outside of the DEQ. This document provides direction to DEQ staff regarding the implementation of rules and laws administered by the DEQ. It is merely explanatory; does not affect the rights of, or procedures and practices available to, the public; and does not have the force and effect of law.

Introduction

The purpose of the Fish Contaminant Monitoring Program (FCMP) is to quantitatively assess the degree of chemical contamination in fish from waters throughout the state. This procedure describes the collection and processing techniques for fish samples to be obtained for contaminant analysis.

Precollection

Staff should maintain a field notebook containing the following information (as a minimum):

- This Procedure
- Department of Natural Resources' (DNR) Fisheries Division Contact List (District Offices and Fish Stations)
- Blank Field Data Sheets
- Current Michigan Fishing Guide

Staff with the responsibility for a specified site will be provided with a Fish Collection Assignment Sheet (Attachment 1) by the FCMP Specialist. The assignment sheet identifies the water body, location, contact people, id#, species (number and size ranges) and processing instructions. Staff should select appropriate fish sampling techniques and collection times after consultation with the appropriate District Fisheries Biologist. Staff collecting fish samples must have Cultural and Scientific Fish Collectors Permits which are issued by the Fisheries Division.

The FCMP and biosurvey (stream shocker and backpack shocker sections) checklists can be used to identify equipment and supplies needed (Attachments 2 and 3). Vehicles, boats, and major equipment (shockers, nets, etc.) must be signed out on the field calendar.

The appropriate Fisheries Division staff and DNR Conservation Officers must be notified by Surface Water Assessment Section (SWAS) staff assigned to a site prior to the fish collections. The names and phone numbers of the people to be contacted will be provided on the Fish Collection Assignment Sheet.

Fish Collections

Most fish will be collected by SWAS and Fisheries Division staff using electrofishing equipment or nets. Since the desired species and size ranges are sometimes not found, the Fish Collection Assignment Sheet will indicate if substitutions can be made. Substitutions will be pursuant to the predator and bottom feeder preference lists (Attachment 4). Species substitutions cannot be made for trend monitoring collections. Size ranges are generally goals and should be met as closely as possible unless noted otherwise on the Fish Collection Assignment Sheet.

The minimum safety training requirements for collection staff are: CPR, First Aid, Boating Safety, and Water Safety. SWAS staff should follow electrofishing safety procedures (SWAS Procedure #WRD-SWAS-005) and other appropriate safety procedures and requirements.

For fish collected for composite samples, when possible the length of the smallest fish should be within 90% of the largest fish.

Once fish are collected, they should be placed on ice and processed on-site or transported to the Filley Street facility. **Special sample processing and handling procedures may be necessary if chain-of-custody needs to be maintained and will be determined on a case- by-case basis**. The Fish Collection Assignment Sheet will indicate if chain-of-custody needs to be maintained.

If the fish are not going to be processed on-site, then they should be:

1) placed in plastic bags (GLEC bags or other large garbage bags) keeping different species separate and keeping the bags under 30 lbs. each;

2) labelled with the water body, location, date, and species;

3) placed in one of the "Fish to be Processed" freezers; and

4) recorded on the Freezer Log Sheet (Attachment 5).

Staff should then notify the FCMP Specialist of the number and species of fish collected.

Fish Processing

The supplies needed to process fish are listed in the FCMP Checklist (Attachment 2). Fresh fish should be sorted by species and kept on ice in a shady location until processing.

To thaw frozen fish for processing:

1) pull fish from Filley Street freezers the afternoon before the day they are to be processed;

2) place the fish in tubs/coolers or on clean plastic bags in the truck well, keeping sites and species separate;

3) take care to avoid contaminating other equipment, especially wooden materials, which are stored in the truck well;

4) try to separate the fish from each other as much as possible to facilitiate thawing; and

5) keep the doors to the truck well closed and the fan on.

The following steps should be followed for processing fish:

1. If processing at the Filley Street Facility, keep the fan on and the interior doors to the truck well closed.

2. Rinse fillet board, cleaning table, and knives with water.

3. Record site information, sample#, species name, length (cms), weight (gms), sex, and sample type on the FCMP Data Sheet (Attachment 6).

4. The Fish Collection Assignment Sheet will identify the appropriate recording procedure for lengths and weights for composite samples. Generally, for smaller fish species (smelt, alewife, etc.) including caged fish study samples, a range for the lengths, and a total weight for the composite will be adequate. In these cases, the number of fish in the composite should be noted under the comments section of the FCMP Data Sheet. For larger fish species the length and weight of each fish in the composite is generally recorded. Attachment 6 shows an example of the data recorded for each case.

5. The comments section of the FCMP Data Sheet should be used to record the following types of information: collection date (native fish not all collected on the same date and caged fish samples), anomalies such as tumors or lamprey marks, fin clips, sample identification information for split samples, etc.

6. If instructed to collect scale/spine/otolith samples for aging, follow the guidance provided in Attachment 7. This will generally only apply to trend monitoring samples.

7. If fish are to be processed whole, proceed to step 10.

8. Starting with the species expected to be least contaminated (i.e., panfish) and working from the smallest to the largest specimen, process according to the Standard Edible Portion list (Attachment 8). Fillet specimen according to the instructions in Attachment 9. Staff will be trained on appropriate fillet techniques.

9. Waste materials should be placed in a trash container lined with garbage bags. Thin garbage bags should be tripled, while thicker bags (i.e., garbage disposal bags) do not need to be. Bags should weigh no more than 30 lbs. Waste bags should be placed in the "Guts" freezer at the Filley Street facility unless they can be disposed of properly on- site.

10. Between each fish, the cutting board and knife(s) should be rinsed with water.

11. Wrap whole fish or edible portion sample in aluminum foil with dull side to fish. Secure package with 2" masking tape by taping lengthwise and around the package along aluminum foil seam. Each fish in a composite sample must be wrapped and labeled individually, unless otherwise indicated on the Fish Collection Assignment Sheet.

12. Label each package with the following information on the masking tape using a waterproof marker:
    - date
    - water body
    - species
    - sample id#
    - composite number (composite samples only)

13. Place each aluminum foil package in a separate clear plastic bag (1 quart or 1 gallon zip-lock bag, or large GLEC bag; depending on size). However, for composite samples, more than one package can go in the same bag.

14. Label the plastic bag with the sample id# using a waterproof marker. If more than 1 plastic bag is necessary per sample (i.e., composite samples), mark each bag with the same sample id# and label 1 of 3, 2 of 3, etc.

15. Place all the bags from a given site id# in a large plastic bag (GLEC or other garbage bag) not to exceed 30 lbs. and label bag with site id# and water body. If more than 1 bag is required for a given site id#, also label the bags 1 of 3, 2 of 3, etc.

16. Samples should be kept on ice until they are placed in the "Processed Fish" freezers at Filley Street and recorded on the Freezer Log.

17. Clean all of the processing equipment and return it to its proper place. If processing at the Filley Street facility, rinse floors with diluted chlorine bleach.

<u>Post Processing</u>

Laboratory Analysis Request Form (Attachment 10) should be filled out and turned into the FCMP Specialist along with the completed Field Data Sheets. The forms will be maintained in the FCMP site files.

SWAS staff will be responsible for transferring the bags from the guts freezer to dumpster on the morning of garbage pick-up days (currently Tuesdays).

The FCMP specialist will coordinate delivery of the fish samples to the MDPH for analysis.

SECTION CHIEF APPROVAL:

Diana Klemans, Chief
Surface Water Assessment Section

Attachment 1

FCMP COLLECTION ASSIGNMENT

SITE I.D. #: ASSIGNED TO:

WATER BODY:

LOCATION:

FUNDING SOURCE: NONPOINT:

FISH DIV. CONTACT: PHONE:

SPECIES TO BE COLLECTED: LENGTH (in.) NUMBER:

SPECIAL INSTRUCTIONS:

** YOU CAN SUBSTITUTE ANOTHER SPECIES USING PREFERENCE LISTS

Attachment 2

FCMP CHECKLIST

Boat

Boat Plug _____
Oars _____
Anchor & Rope _____
Motor _____
Gas & Oil _____
Cushions Life _____
Jackets
Hitch Lock & Key _____

Fishing Gear

Fyke/Hoop/Trap/Gill Nets _____
Net Anchors w/Ropes _____
Net Floats w/Ropes _____
Seine _____
Waders/Hip Boots/Knee Boots _____
Gill Net Picks _____

Fish Processing Tools

Scale & Tripod _____
Measuring Board _____
GLECS Plastic Bags _____
Ziploc Bags
Gallon _____
Quart _____
Trash Bags _____
Trash Can _____
Table _____
Tape _____
Tubs _____
Scale Envelopes Pens _____
& Markers Fillet _____
Knives & Steel Labels _____
Aluminum Foil _____
Sharpening Stone _____
Wash Brush Cutting _____
Board _____
Fish Data Field Sheets _____
Fish Collection Notebook _____

Miscellaneous

Fathometer (connectors & battery) _____
Maps _____
Cooler(s)/Ice _____
Camera & Film _____
Mosquito Repellant _____
Fish Finder/Depth Finder _____
Global Positioning System _____
Sun Block/Sunglasses _____
Raingear _____
Collectors Permit _____

Attachment 3

BIOSURVEY CHECKLIST

Stream Shocker

Sport Yak w/ Bottom Board _____
Control Box _____
Ground (Floating) Probes _____
Safety Switch _____
Generator _____
Gas _____
Rubber Gloves _____
Nets _____
Collection Tub _____

Clothing

Waders/Hip & Knee Boots _____
Raingear _____
Socks _____
Hat _____

Miscellaneous

Measuring Tape _____
Camera & Film _____
Polarized Sunglasses _____
Mosquito Repellant _____
Sunblock/Sunglasses _____
Maps _____
Sample Jars/Bottles _____
Cooler/Ice _____
Stainless Steel Bowl/Spoon _____
(Sediment Samples)
Data Forms _____
Preservative Kits _____
Global Positioning System _____
Business Cards _____

Backpack Shocker

Backpack Shocker _____
Charged Batteries _____
Probes _____
Ground (Floating) _____
Nets _____
Collection Tub _____
Rubber Gloves _____

Fish & Benthos Processing Gear

Measuring Board _____
Porcelain Pan _____
Bucket _____
Sieve Bucket _____
Aquarium Net _____
Tweezers/Forceps _____
Eye Dropper _____
Tubs _____
Dip Nets _____
Vials (2 oz.) _____
Station Cards _____
Pens _____
Clipboard & Paper _____
Alcohol _____
Formalin _____
Thermometer _____
Hand Lens _____

Attachment 4

Predator Preference List

When predator is indicated, please apply the following guidance. Our first preference is to substitute a top line predator from Group 1. If we are unable to obtain a species from Group 1, then a Group 2 species may be substituted. Size ranges are goals.

	Species	# of Fish	Size Range
Group 1: 5 19" +	Walleye	5	15" - 18"
5 26" +	Northern Pike	5	24" – 25"
5 16" +	Smallmouth Bass	5	14" – 15"
5 16" +	Largemouth Bass	5	14" – 15"
Group 2:	Yellow Perch	10	9" +
	Black Crappie	10	9" +
	Rock Bass	10	9" +

Bottom Feeder Preference List

When bottom feeder is indicated, carp is always the preferred species. If carp are not available, one of the other species listed below can be substituted.

Species	# of Fish	Size Range
Carp	5	18" – 22"
5 23" +	10	12" +
Sucker sp.*	10	12" +
Channel Catfish	10	6" – 8"
Bullhead sp.*	10	9" +

*Please do not mix different species in a sample (i.e., use 10 white sucker or 10 redhorse sucker).

Attachment 5

FREEZER NUMBER

Number	Water Body	Date In	Date Out

Attachment 6

FCMP Data Sheet

TOWNSHIP _____ RANGE _____ SECTION _____

Site ID#: *94-01* Waterbody: *Lake Superior* Location: *Keewenaw Bay* Caged: *N*

Collection Date: *1/1/94* Waterbody Type: *GLS* Storet Station #: _____ Grid: _____

Collected By: *Fisheries Division* Processed By: *Smith/Jones* Lab: *MDPH*

Sample Number	Species	Total Length (cm)	Weight (g)	Sex	Age (yrs.)	Sample Type	Comments
93001-01	**Smelt**	*6-7*	*300*			*O*	**Composite sample of 100 fish 6-7 cm**
93001-02	**Lake Trout**	*58.0*	*2000*			*F*	*Composite sample of 5 fish*
93001-02	**Lake Trout**	*63.5*	*2850*			*F*	
93001-02	**Lake Trout**	*57.5*	*1920*			*F*	
93001-02	**Lake Trout**	*62.0*	*2500*			*F*	
93001-02	**Lake Trout**	*61.5*	*2160*			*F*	

Attachment 7

Procedure for Collecting Samples for Aging Fish

1. Scale samples should be taken from the appropriate location on the fish (see diagram below). Take the knife point and pull the scales away from the skin. Do not take scales by scraping against them.

2. Scale samples are not adequate for aging some fish species. For the species listed below collect the appropriate items as indicated.

   Walleye – scale sample and the dorsal fin spines

   Carp – scale sample and dorsal fin spines

   Lake Trout – otoliths

   Redhorse Sucker – pectoral fin spines

   Sturgeon – pectoral finn spines

   When collecting the dorsal and pectoral fin spines de-articulate the spine from the fish, do not cut the spines. De-articulating is what you are doing when you pull a drumstick off a whole chicken. This is important because we need to get the base of the spine to get an accurate age reading.

3. Samples should be placed in scale sample envelopes and the pertinent information as indicated below should be filled out.

Otolith Collection Process

Remove gills and scrape away the soft tissues at the base of the brain.

Locate knife across pseudobranchs inside the gill covers, slightly posterior to the point of the arrow-shaped bony structure (prootic bone) at the base of the brain cavity where the vertebral column begins (exposed portion of prootic bone).

Apply enough pressure on the knife to sever midway through pair of bulla in the prootic bone taking care not to cut all the way through the cavities containing the two otoliths. Break the prootic bulla bone open as you would a single shotgun, being careful not to tear the fish in half. Each of the otoliths should now be readily observable nestled in its cavity. If the lake trout was subdued with too much zeal (clubbed too hard), the contents of the cavities may be bloody, making otoliths nearly impossible to locate. The moral of this is use just enough force to subdue the fish.

Pick each otolith out with a pair of forceps and put them on the back of your fillet gloved hand. Tease all the soft tissue of the sacculus away from the otoliths until they are stripped clean of any membranes. Now pick them off the glove and place them in a scale sample envelope for storage.

Richard T. Jamsen, Fisheries Boat Captain

Michigan Dept. of Natural Resources
3/93

Attachment 8

Standard edible portions of Michigan's sport and commercial fishes.

Listed below are the "standard edible portions" for Michigan fishes. The "standard edible portion" will be used for preparing fish for contaminant analyses. The "standard edible portion" is that portion of the listed species of fish that people generally eat.

Standard edible portion	Common Name	Scientific Name
	Yellow Perch	Perca flavenscens
	Walleye	Stizostedion vitreum
	Sauger	Stizostedion canadense
	Largemouth Bass	Micropterus salmonids
	Smallmouth Bass	Micropterus dolomieui
	Bluegill	Lepomis macrochirus
Skin -On	Pumpkin seed	Lepomis gibbosus
	Rock Bass	Amploplites rupestris
Fillet	White Bass	Morone chrysops
	Black Crappie	Pomoxis nigromaculatus
	White Crappie	Pomoxis annularis
	Green Sunfish	Lepomis cyanellus
	Longear Sunfish	Lepomis megalotis
	Warmouth	Lepomis gulosus
	Sucker family	Catastomidae
	Lake Whitefish	Coregonus clupeaformis
	Lake Trout (lean & siscowet)	Salvelinus namaycush
	Rainbow Trout (steelhead)	Oncorhynchus mykiss
	Brown Trout	Salmo trutta
	Brook Trout	Salvelinus fontinalis
	Splake	Salvelinus fontinalis x Salvelinus namaycush
	Atlantic Salmon	Salmo salar
	Coho Salmon	Oncorhynchus kisutch
	Chinook Salmon	Oncorhynchus tschawytscha
	Pink Salmon	Oncorhynchus gorbuscha
	Black Bullhead	Ichtalurus melas
	Brown Bullhead	Ichtalurus nebulosus
	Yellow Bullhead	Ichtalurus natalis
	Channel Catfish	Ictalurus punctatus
	Muskellunge	Esox masquinongy
	Northern Pike	Esox lucius
	Round Whitefish (Menominee)	Prosopium cylindraceum
Skin - Off	Lake Herring	Coregonu artedii
	Chubs	Coregonus hovi
Fillet	Carp	Cyprinus carpio
	Freshwater Drum (Sheepshead)	Aplodinotus grunniens
	Buffalo	Ictiobus cyprinellus
	Burbot	Lota lota
	Quillback	Carpiodes cyprinus
Skin - Off Steak*	Sturgeon	Acipenser fulvescens
Headless, Gutted	Rainbow Smelt	Osmerus morda

* 3" wide full cross section from the area 9" – 12" anterior to the dorsal fin 9/9/97

Attachment 9

1. Make a cut behind the entire length of the operculum (gill cover) cutting through the skin and flesh to the spinal column. Dorsal to ventral cut.

2. Make a shallow cut through the skin (to spinal column) from the base of head to the posterior end of the caudal peduncle.

3. Make a ventral cut along the belly from the base of the pectoral fin to the posterior end of the caudal peduncle. Cut around all fins.

4. Remove the fillet and then remove any major bones.

Attachment 10

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
FISH CONTAMINANT ANALYSIS MONITORING PROGRAM
LABORATORY ANALYSIS REQUEST FORM

Sent:
Received:

***Code**

F	skin-on fillet
O	Other (e.g. steak, headless and gutless etc.)
W	whole fish
E	egg only
FS	skin-off fillet
C	composite

Notes:

DEQ ID #	Analysis	Species	Weight (kg)	*Code	Waterbody	Location	Control	Fund Source

Analysis Request List

Mercury Only
Mercury & Organics
Hg/Org/PBDE
Hg/Org/Diox-Furans
Hg/Org/Diox-Furans/PBDE
Hg/Org/Diox-Furans/CoPCB
Hg/Org/Diox-Furans/CoPCB/PBDE