




UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
Marine Operations Center
439 W. York Street
Norfolk, VA 23510-1114

May 18, 2016

MEMORANDUM FOR: Master Donn Pratt, NOAA
Commanding Officer, NOAA Ship *Gordon Gunter*

FROM:  Captain Anne K. Lynch, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for GU-16-08
Ecosystem Monitoring Survey

Attached is the final Project Instruction for GU-16-08, Ecosystem Monitoring Survey, which is scheduled aboard NOAA Ship *Gordon Gunter* during the period of May 21 – June 3, 2016. Of the 14 DAS scheduled for this project, 14 DAS are Program funded by a Line Office Allocation. This project is estimated to exhibit a Medium Operational Tempo. Acknowledge receipt of these instructions via e-mail to OpsMgr.MOA@noaa.gov at Marine Operations Center-Atlantic.

cc:
Nathan Keith



I. Overview

A. Brief Summary and Project Period

The principal objective of the survey is to assess the hydrographic, planktonic and pelagic components of the Northeast U.S. Continental Shelf Ecosystem. Specifically we will quantify the spatial distribution of the following parameters: water currents, water properties, phytoplankton, microzooplankton, mesozooplankton, sea turtles and marine mammals. We will use traditional and novel techniques and instruments. A broad array of measurements of the pelagic ecosystem will be made during the 21 May – 3 June 2016 time period.

B. Days at Sea (DAS)

Of the 14 DAS scheduled for this project, 14 DAS are funded by a Line Office Allocation. This project is estimated to exhibit a Medium Operational Tempo.

C. Operating Area

The continental shelf from north of Cape Hatteras, NC, including Georges Bank and the Gulf of Maine, to the Nova Scotia Shelf (including stations in Canada's Exclusive Economic Zone). Stations will be occupied in waters with depths ranging between 15 and 500 meters.

D. Summary of Objectives

Operational objectives are to: (1) collect underway data using TSG, SCS, and ADCP; (2) complete CTD and bongo operations at stations throughout area, (3) collect biological data with bongo plankton nets, (4) collect marine mammal and seabird observations, and (5) collect online data and imagery of phytoplankton and ciliates using Imaging FlowCytobot units.

The Ecosystem Monitoring surveys contribute to stock assessments, protected species assessments, ecosystem assessments, and climate assessments. As such, the surveys are multi-objective. Ichthyoplankton and hydrographic data are collected for stock assessments. A range of ecosystem observations are made, from nutrients and ocean acidification to marine mammals, and a number of the measurements are used in NEFSC ecosystem assessment products. The ocean acidification and hydrographic measurements are incorporated into the region's climate assessments.

This survey is multidisciplinary and as such will integrate all these operations. The cruise plan will evolve with input from scientists as well as the officers and crew of *Gordon Gunter*. A post-cruise meeting will focus on lessons learned and improvements to make for subsequent surveys of this type.

E. Participating Institutions

NMFS-Northeast Fisheries Science Center
Woods Hole Oceanographic Institute
University of Maine

Canadian Wildlife Service
University of Rhode Island
Princeton University

F. Personnel/Science Party

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Prezioso, Jerome	Chief Scientist.	05/21/2016	06/03/2016	M	NMFS	US
Holzwarth- Davis, Tamara	Lead CTD Specialist	05/21/2016	06/03/2016	F	NMFS	US
Carter, Lauren	Fishery Biologist	05/21/2016	06/03/2016	F	Integrated Statistics	US
Taylor, Christopher	Fishery Biologist	05/21/2015	06/03/2016	M	Integrated Statistics	US
Kittell- Porter, Lauren	Student Volunteer	05/21/2016	06/03/2016	F	University of RI	US
Lueders- Dumont, Jessica	Marine Researcher	05/21/2016	06/03/2016	F	Princeton University	US
Clarke, Bonnie	Student Volunteer	05/21/2016	06/03/2016	F	Princeton University	US
John Loch	Seabird Observer	05/21/2016	06/03/2016	M	Canadian Wildlife Service	Canada
Topor, Zachary	Student Volunteer	05/19/2016	06/03/2016	M	University of Maine	US

G. Administrative

1. Points of Contact:

Chief Scientist – Jerome Prezioso NOAA Fisheries 28 Tarzwell Drive Narragansett, RI 02882, jerry.prezioso@noaa.gov 401 742-0228

Project Operations Leads-Tamara Holzwarth-Davis-NOAA Fisheries 166 Water Street, Woods Hole, MA 02543 Christopher Taylor – NOAA Fisheries 28 Tarzwell Drive, Narragansett, RI 02882 chris.l.taylor@noaa.gov, 401-782-3200, Christopher Melrose

Email Contact: The following should be included as recipients of the daily e-mail message:

Wendy.Gabriel@noaa.gov	{FEMAD Chief}
Thomas.Noji@noaa.gov	{EPD Chief}
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Jon.Hare@noaa.gov	{Oceanography Branch Chief}
Tamara.Holzwarth-Davis@noaa.gov	{Oceanography Branch}
CO.Gordon.Gunter@noaa.gov	{Commanding Officer – <i>Gordon Gunter</i> }
Michael.S.Abbott@noaa.gov	{NEFSC Port Captain}
ops.Gordon.Gunter@noaa.gov	{Operations Officer – <i>Gordon Gunter</i> }

2. Diplomatic Clearances

This project involves Marine Scientific Research in waters under the jurisdiction of Canada. Diplomatic clearance has been requested.

3. Licenses and Permits

This project will be conducted under the guidance of the Science and Research Director, Northeast Fisheries Science Center and Canadian

Foreign Fishing Vessel License number 343668, issued on April 28, 2016 and already on board the vessel.

II. Operations

The Chief Scientist is responsible for ensuring the scientific staff are trained in planned operations and are knowledgeable of project objectives and priorities. The Commanding Officer is responsible for ensuring all operations conform to the ship's accepted practices and procedures.

A. Project Itinerary:

21 May: Depart Davisville, RI and depart Narragansett Bay to commence survey.

3 June: Complete cruise operations and dock in Davisville, RI.

B. Staging and Destaging:

19 May: Begin cruise staging at Davisville, RI. Load and set up scientific equipment and complete CTD and SCS installations.

3 June: Dock Davisville, RI. Disembark scientific personnel, and off-load scientific equipment and samples.

C. Operations to be conducted:

The survey consists of 156 random-stratified and fixed Oceanography stations in the Middle Atlantic Bight, Southern New England, Georges Bank and the Gulf of Maine (Table 1, Figure 1.) These stations are randomly distributed at varying distances, and as such there is no fixed expectation of number to be covered each day. Rather, the progress of the survey will depend on transit time, sea state, and water depth of the stations, with deeper stations requiring more time to complete operations. Some stations will also have more complex operations scheduled, such as a water cast and a bongo tow, which will increase the amount of time spent on-station.

There are 4 NERACOOS buoys, E, I, M and N in the Gulf of Maine area where a rosette cast will be made as close as safely possible to collect nutrient samples,. Specifically, these buoys have Submersible Ultraviolet Nitrate Analyzer (SUNA) sensors at 50 m for buoys E and I, surface, 20, 50, 100, 150 and 250 m for buoy M and 50, 100, and 180 m for buoy N.

There are 8 inshore Mackerel Sampling Stations (MACK 1-8, Table 1) and 6 offshore Hake Sampling Stations (HAKE 1-6, Table 1), which will be sampled **if time permits**. The Hake Sampling Stations will provide larval data to better define the stock structure of Red Hake and to create a larval index of spawning stock biomass.

Several of the ship's systems will be running and continuously logging: ADCP, TSG, and EK-60 data from the entire track-line. Personnel from Woods Hole Oceanographic Institution will be using water from the scientific seawater flow-through system to capture images of phytoplankton with an Imaging FlowCytobot Unit on a dedicated computer. Marine mammal and seabird observers will be stationed on the bridge or flying bridge making continual observations during daylight hours.

Oceanographic station locations and a cruise track will be provided to the vessel prior to sailing to allow the navigation officer ample time to load this information into the navigation systems. The Commanding Officer and Chief Scientist will jointly modify the track during the cruise as weather conditions and time constraints vary to best achieve the cruise objectives. **Highest reasonable cruising speeds should be employed to improve the potential to complete the cruise missions. Transiting between stations located 15 or more nautical miles apart at speeds of 10 knots or greater when possible can greatly improve the coverage of the survey area within the 14 allotted days for this cruise.**

Oceanography Stations: A Seabird CTD profiler attached to a bongo net will be deployed at approximately 125 stations. In addition, a Seabird CTD 19+ profiler will be deployed alone or with a single Niskin bottle to collect data at deep stations (>200 m) and to collect water for salinity and chlorophyll calibrations, nutrient, DIC and total alkalinity analysis. A Seabird 911+ CTD will be deployed on a rosette frame with a carousel water sampling system (SBE32) and 11 10-liter Niskin bottles at a subset of fixed stations (Figure 3). This package will collect profiles of water temperature, salinity, chlorophyll-a and oxygen levels. Water samples collected by the Niskin sampling bottles at multiple depths along the upcast will be processed ashore for nutrients and carbonate chemistry. A stand-alone USB-based GPS system will be installed in the CTD lab. The magnetically mounted antenna will be mounted outside on the superstructure, connected to a PC in the laboratory by a cable led through a bulkhead pass-through. This unit will provide independent station location data to the CTD system.

The deployments of the Seabird 19+ and 911+ CTD units will use the two oceanographic winches and the CTD computer located in the dry lab.

Acoustic Survey Operations: EK-60 operations will be conducted continuously throughout the cruise track at the highest safe transit speed possible, and during scientific gear deployments.

Scientific Computer System (SCS): *Gordon Gunter's* SCS system is a PC-based server, which continuously collects and distributes scientific data from various navigational, oceanographic, meteorological, and sampling sensors throughout the cruise. The SCS EventLog program has also been configured for NEFSC Fisheries Acoustic Survey operations, and will be used by the scientists to document all operational events (*e.g.*, beginning and end of gear deployments). Date and time for data collections from computers, instrumentation, and logsheets recording will be synchronized using the vessel's GPS master clock and Dimension IV software. The NEFSC and *Gordon Gunter's* ET are responsible for ensuring data collection and logging. A stand-alone GPS system will be installed in the CTD lab with its antenna mounted outside on the superstructure. This unit will provide independent station location data to the SCS system.

1. Continuous Underway Sampling:

1.1. SCS

1.1.1. Navigational, meteorological, and environmental data will be archived throughout the cruise using *Gordon Gunter's* Scientific Computer System (SCS).

1.1.2. Ship Requirements

1.1.2.1. SCS system should be running for duration of cruise

1.2. ADCP

1.2.1. Current speed and direction

1.2.2. Backscatter at 150 kHz

1.2.3. Ship Requirements

1.2.3.1. ADCP running during cruise and logging data NOTE: The ADCP is set with an external trigger to be a slave with the EK60. There is still some minor interference we are seeing on the 120kHz EK60.

1.3. Flow-through system

1.3.1. TSG - salinity, temperature, density

1.3.2. pCO₂ system surface water and atmospheric CO₂

1.3.3. Discrete samples – drawn from flow-through by scientists

1.3.3.1. DIC – dissolved inorganic carbon

1.3.3.2. salt – for salinity calibrations

1.3.4. Ship Requirements

1.3.4.1. Flowthrough system cleaned prior to cruise (freshwater flush)

1.3.4.2. Flowthrough system running during cruise and logging data

1.3.4.3. Ability to draw small amount of water from system for Imaging FlowCytobot unit.

1.4. Fisheries acoustics

1.4.1. EK-60

1.4.2. Ship Requirements

1.4.2.1. Acoustics running during cruise at all frequencies and logging data

NOTE: Extraneous echo sounders should be turned off to eliminate or at least minimize acoustic interference with the EK60.

1.5. Fisheries acoustics

1.5.1. EK-60

1.5.2. Ship Requirements

1.5.2.1. Both acoustics running during cruise at all frequencies and logging data

NOTE: Extraneous echo sounders should be turned off to eliminate or at least minimize acoustic interference with the EK60.

1.6 Surface observations

1.6.1 Marine mammal observations made during daylight hours by two observers rotating on a 4 hour schedule, either on the bridge or flying bridge. Seabird observations will be made from the bridge by a third observer during daylight hours.

1.6.2 Ship Requirements

1.6.2.1 110 VAC available either on the flying bridge or bridge for the observers' laptops.

1.7 Water Bottle Cast – deployed at subset of stations surface to 500 m or 5 m from bottom

1.7.2 SBE19 – Temperature, conductivity, depth

1.7.3 Water bottles – tripped manually with a messenger for salinity calibrations.

1.7.4 Ship Requirements

1.7.4.1 None

Data: At the end of the cruise the ship will provide the chief scientist with three copies of the data from the EK60 transducer, the ADCP unit and the SCS system. The chief scientist will provide a 1 terabyte drive for this. A copy of the SCS data should also be FTP'd to DMS personnel in Woods Hole.

D. Dive Plan

Dives are not planned for this project.

E. Applicable Restrictions

Conditions which would preclude normal operations may include the following:

Adverse weather – Marginal conditions such as high seas and winds that make deploying gear over the side hazardous to personnel, and secondarily to the equipment, warrant having operations suspended until the command deems conditions safe again. One way to mitigate such interruptions would involve coordination between the chief scientist and the command to adjust the cruise track to avoid the worst weather and continue operations in a more sheltered area where they can be conducted safely.

Equipment failures - if scientific, may involve the adjustment of sampling strategies to permit survey operations to continue with functional equipment. Vessel equipment failures will be worked out on an

ad hoc basis between the scientists and command to permit survey operations to continue with the understanding that the safety of the vessel is always the top priority.

Mitigation for Protected Resources:

Plankton Nets, Small-mesh Towed Nets, Oceanographic Sampling Devices, Video Cameras, and Remotely Operated Vessel (ROV) Deployments

The NEFSC deploys a wide variety of gear to sample the marine environment during many of their research cruises, such as plankton nets, oceanographic sampling devices, video cameras, and ROVs. These types of gear are not considered to pose any risk to protected species because of their small size, slow deployment speeds, and/or structural details of the gear and are therefore not subject to specific mitigation measures. However, the officer on watch and crew monitor for any unusual circumstances that may arise at a sampling site and use their professional judgment and discretion to avoid any potential risks to protected species during deployment of all research equipment.

“Take” of Protected Resources: Under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) it is unlawful to take a protected species. The MMPA defines take as “harass, hunt, capture, kill, or collect, or attempt to harass, hunt, capture, or collect” **unless specifically authorized under a Marine Mammal Protected Species Permit.** The ESA defines take as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” An incidental take is one that is incidental to, but not the purpose of, otherwise lawful activities.

In the event of an incidental take of a marine mammal or federally listed threatened or endangered species during the cruise, the chief scientist will take the following actions:

Marine turtle, Sturgeon and Atlantic salmon bycatch: All marine turtles, sturgeon and Atlantic salmon taken incidental to fishing activities, must be documented and handled according to established procedures in **the Endangered Species Act Section 7 Consultation Biological Opinion (BIOIP)** issued on November 30, 2012. Dead turtles shall, if feasible, be frozen and returned to the Woods Hole Laboratory. Please refer to the appendices, (appendix B – E of the BIOIP) for handling and sampling procedures. Information should be collected on the separate Sturgeon and Turtle Data Collection Sheets and required information should be submitted within 24 hours of the take to Incidental.Take@noaa.gov, Elizabeth.Josephson@noaa.gov, Nathan.Keith@noaa.gov, Sarah.Pike@noaa.gov for PSIT entry.

Marine mammal bycatch: All marine mammals taken incidental to fishing activities must be documented and handled according to established protocols outlined in the **Procedures & Actions for Incidental Takes of Marine Mammals in Research & Monitoring Activities** located in the appendices. Information should be collected on the Marine Mammal Data Collection Sheet and required PSIT information should be submitted within 24 hours of the take to Incidental.Take@noaa.gov, Elizabeth.Josephson@noaa.gov, Nathan.Keith@noaa.gov, Sarah.Pike@noaa.gov.

Migratory bird salvage: Please refer to the Federal Fish and Wildlife “Special Purpose – Salvage” Permit located in the appendices for the salvage of dead migratory birds (except species listed as threatened or endangered under the Endangered Species Act; see 50 CFR 17.11).

III. Equipment

A. Equipment and Capabilities provided by the ship (itemized)

Ship Requirements for Acoustics

Simrad EK60 Scientific Sounder: The Simrad EK60 Scientific Sounder will be the primary sampling gear used during fisheries acoustic surveys for providing species-specific abundance estimates. The EK60 operates four transducers mounted on the retractable keel (18, 38, 120, and 200 kHz split-beam transducers). EK60 data are logged to the EK60 data server, which is on the ship's and scientific networks. RS232 connections are used for navigational (Differential GPS) input. The SCS Event Logger will be used to record all operational events (e.g., begin and end points of transects, stations, gear deployments, and other events that affect the track cruise and vessel speed) during the cruise.

The EK60 will be synchronized to the ADCP and ship's EK60 echo sounders. All extraneous echo sounders need to be turned off to eliminate or at least minimize acoustic interference with the EK60. At the beginning of the cruise, it may be necessary to turn off sounders to determine sources of interference. The ADCP is set with an external trigger to be a slave with the EK60. There still is some minor interference at 120kHz on the EK60 and thus, the ADCP may need to be turned off at times during the cruise.

Acoustics are running during cruise at all frequencies and logging data.

Scientific Computer System (SCS): *Gordon Gunter's* SCS system is a PC-based server, which continuously collects and distributes scientific data from various navigational, oceanographic, meteorological, and sampling sensors throughout the cruise. The SCS EventLog program has also been configured for NEFSC Fisheries Acoustic Survey operations, and will be used by the scientists to document all operational events (e.g., beginning and end of deployments). Date and time for data collections from computers, instrumentation, and logsheets recording will be synchronized using the vessel's GPS master clock and Dimension IV software. The NEFSC and *Gordon Gunter's* ST and ET are responsible for ensuring data collection and logging.

Ship Requirements for Side Sampling Station and Oceanographic Operations

SBE911 connected to conducting cable on forward winch.

Slip rings are to be checked prior to cruise and redone if necessary.

New terminations will be done prior to the start of this cruise for both oceanographic winches.

SBE19 connected to conducting cable on aft winch for bongo deployments.

NEMA Data String for CTD Computer.

Disposal of waste water cannot happen before, during, or right after CTD rosette operations.

Smoking is not allowed on Oceanography deck due to nutrient and carbonate chemistry sampling.

NEMA Data String to Computer Lab.

Ultra-cold (-80°C) freezer (tested prior to embarkation) for storage of samples.

Ship Requirements for Continuous Underway Sampling

SCS - Navigational, meteorological, and environmental data will be archived throughout the cruise using *Gordon Gunter's* Scientific Computer System (SCS).
SCS system should be running for duration of cruise.

ADCP - Running during cruise and logging data.

NOTE: The ADCP is set with an external trigger to be a slave with the EK60. There still is some minor interference we are seeing on the 120 kHz EK60.

Flow-through system - TSG - salinity, temperature, density.

Fluorometer – chlorophyll-a concentration.

Imaging FlowCytobot – small amount of seawater drawn from the system to obtain phytoplankton images.

PCO2 system – operational during the entire cruise period

Discrete samples – drawn from flow-through by scientists.

DIC – dissolved inorganic carbon.

salt – for salinity calibrations.

Flowthrough system cleaned prior to cruise (freshwater flush).

Flowthrough system running during cruise and logging data.

Ability to draw water samples from system and to plumb in Imaging FlowCytobot instrument from WHOI.

B. Equipment and Capabilities provided by the scientists (itemized)

CTD Rosette Operations :

A CTD Rosette will be deployed at subset of stations surface to **500 m max depth** or 5 m from bottom; at approximately 20-50 locations during the course of the cruise.

SBE911 – salinity, temperature, density.

Fluoroprobe – distinguishes among groups of phytoplankton.

Fluorometer – chlorophyll a concentration.

PAR – for light measurement.

Water bottles – tripped automatically from computer in CTD Lab.

Salt - for salinity calibrations.

Nutrients – N, P, Si, others.

Ocean Carbon – DIC, Total alkalinity.

Phytoplankton species composition.

Microzooplankton species composition.

Chlorophyll-a – measured directly.

Oceanography Stations:

SBE19 CTD/Bongo – deployed at most stations surface to **200 m max depth** or 5 m from bottom.

Seabird 911– Temperature, conductivity, depth deployed with rosette having 10 ten-liter bottles plus a fluorometer and radiometer.

61 cm, 333 micron mesh– zooplankton and ichthyoplankton.

20 cm, 165 micron mesh – microzooplankton and zooplankton (20 stations).

45 kg depressor weight for bongo net deployments.

Continuous Underway Sampling:

Imaging FlowCytobot: An Imaging Flow Cytobot unit will be plumbed into the scientific flow-through system and used throughout the cruise. The unit will require a very small amount of seawater from the flow-through system and 110 VAC (Figure 4). This unit will be brought to the ship as early as possible during staging to ensure optimal installation and functionality.

IV. Hazardous Materials

A. Policy and Compliance

The Chief Scientist is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it). By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and quantity, MSDS, appropriate spill cleanup materials (neutralizing agents, buffers, or absorbents) in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and chemical safety and spill response procedures. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per OMAO procedure, the scientific party will include with their project instructions and provide to the CO of the respective ship 30 days before departure:

- List of chemicals by name with anticipated quantity
- List of spill response materials, including neutralizing agents, buffers, and absorbents
- Chemical safety and spill response procedures, such as excerpts of the program's Chemical Hygiene Plan or SOPs relevant for shipboard laboratories
- For bulk quantities of chemicals in excess of 50 gallons total or in containers larger than 10 gallons each, notify ship's Operations Officer regarding quantity, packaging and chemical to verify safe stowage is available as soon as chemical quantities are known.

Upon embarkation and prior to loading hazardous materials aboard the vessel, the scientific party will provide to the CO or their designee:

- An inventory list showing actual amount of hazardous material brought aboard
- An MSDS for each material
- Confirmation that neutralizing agents and spill equipment were brought aboard sufficient to contain and cleanup all of the hazardous material brought aboard by the program
- Confirmation that chemical safety and spill response procedures were brought aboard

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory showing that all chemicals were removed from the vessel. The CO's designee will maintain a log to track scientific party hazardous materials. MSDS will be made available to the ship's complement, in compliance with Hazard Communication Laws.

Scientific parties are expected to manage and respond to spills of scientific hazardous materials. Overboard discharge of hazardous materials is not permitted aboard NOAA ships.

B. Inventory

Common Name of Material	Qty	Notes	Trained Individual	Spill control
Acetone (90%)	2 x 500 ml.	,Located in chem lab.	Jerome Prezioso	E
Formaldehyde solution (37%)	2 x 20 liters	Stored in ship chem. locker. 20 liters will be in dispensing carboy in Preservation Area.	Jerome Prezioso	F
Ethanol (95%)	4 x 20 liters	Stored in ship chem. locker. 20 liters will be in dispensing carboy in Preservation Area.	Jerome Prezioso	E
Mercuric Chloride	1 x 50 ml.	In Tertiary containment, in hood.	Chris Taylor	M

C. Chemical safety and spill response procedures

- **Formalin/Formaldehyde**
 - Ventilate area of leak or spill. Remove all sources of ignition.
 - Wear appropriate personal protective equipment.
 - Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible.
 - Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container.
 - Do not use combustible materials, such as saw dust.

Neutralizer and Absorbent Materials

Spill-X-FP, Formaldehyde Eater and Spilfyter (Trade Marks) will be brought in sufficient quantities – (two 5-gallon buckets and several 2 lb. containers) to neutralize 40 liters of 37% Formaldehyde solution.

Absorbent ground clay containment material will be brought along to absorb spilled chemicals – (two 14 lb. containers).

D. Radioactive Materials

No Radioactive Isotopes are planned for this project.

V. Additional Projects

A. Supplementary (“Piggyback”) Projects
No Supplementary Projects are planned.

B. NOAA Fleet Ancillary Projects
No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

Disposition of data gathered aboard NOAA ships will conform to NAO 216-101 *Ocean Data Acquisitions* and NAO 212-15 *Management of Environmental Data and Information*. To guide the implementation of these NAOs, NOAA’s Environmental Data Management Committee (EDMC) provides the *NOAA Data Documentation Procedural Directive* (data documentation) and *NOAA Data Management Planning Procedural Directive* (preparation of Data Management Plans). OMAO is developing procedures and allocating resources to manage OMAO data and Programs are encouraged to do the same for their Project data.

A. Data Classifications: *Under Development*

- a. OMAO Data
- b. Program Data

B. Responsibilities: *Under Development*

VII. Meetings, Vessel Familiarization, and Project Evaluations

A. Pre-Project Meeting: The Chief Scientist and Commanding Officer will conduct a meeting of pertinent members of the scientific party and ship’s crew to discuss protected resources monitoring, mitigation, and incidental take procedures, required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning of the project with sufficient time to allow for preparation of the ship and project personnel. The ship’s Operations Officer usually is delegated to assist the Chief Scientist in arranging this meeting.

B. Vessel Familiarization Meeting: The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and vessel protocols, e.g., meals, watches, etiquette, drills, etc. A vessel familiarization meeting shall be conducted in the first 24 hours of the project’s start and is normally presented by the ship’s Operations Officer.

- C. **Post-Project Meeting:** The Commanding Officer is responsible for conducted a meeting no earlier than 24 hours before or 7 days after the completion of a project to discuss the overall success and short comings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the ship's officers, applicable crew, the Chief Scientist, and members of the scientific party and is normally arranged by the Operations Officer and Chief Scientist.
- D. **Project Evaluation Report**
Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Chief Scientist. The form is available at <http://www.oma.noaa.gov/fleeteval.html> and provides a "Submit" button at the end of the form. Submitted form data is deposited into a spreadsheet used by OMAO management to analyze the information. Though the complete form is not shared with the ships', specific concerns and praises are followed up on while not divulging the identity of the evaluator.

VIII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the scientists listed above. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least seven days prior to the project.

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Chief Scientist. The Chief Scientist and Commanding Officer will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship's complement. The Chief Scientist is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Chief Scientist is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the project and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Chief Scientist will ensure that all non NOAA or non Federal scientists aboard also have proper orders. It is the responsibility of the Chief Scientist to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 17, 2000 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, NF 57-10-01 (3-14)) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website <http://www.corporateservices.noaa.gov/noaforms/eforms/nf57-10-01.pdf>.

All NHSQs submitted after March 1, 2014 must be accompanied by [NOAA Form \(NF\) 57-10-02](#) - Tuberculosis Screening Document in compliance with [OMAO Policy 1008](#) (Tuberculosis Protection Program).

The completed forms should be sent to the Regional Director of Health Services at the applicable Marine Operations Center. The NHSQ and Tuberculosis Screening Document should reach the Health Services Office no later than 4 weeks prior to the start of the project to allow time for the participant to obtain and submit additional information should health services require it, before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of either form. Ensure to fully complete each form and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

The participant can mail, fax, or email the forms to the contact information below. Participants should take precautions to protect their Personally Identifiable Information (PII) and medical information and ensure all correspondence adheres to DOC guidance (http://ocio.os.doc.gov/ITPolicyandPrograms/IT_Privacy/PROD01_008240).

The only secure email process approved by NOAA is [Accellion Secure File Transfer](#) which requires the sender to setup an account. [Accellion's Web Users Guide](#) is a valuable aid in using this service, however to reduce cost the DOC contract doesn't provide for automatically issuing full functioning accounts. To receive access to a "Send Tab", after your Accellion account has been established send an email from the associated email account to accellionAlerts@doc.gov requesting access to the "Send Tab" function. They will notify you via email usually within 1 business day of your approval. The "Send Tab" function will be accessible for 30 days.

Contact information:

Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone 757-441-6320
Fax 757-441-3760
Email MOA.Health.Services@noaa.gov

Prior to departure, the Chief Scientist must provide an electronic listing of emergency contacts to the Operations Officer for all members of the scientific party, with the following information: contact name, address, relationship to member, and telephone number.

C. Shipboard Safety

Hard hats are required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. At the discretion of the ship CO, safety shoes (i.e. steel or composite toe protection) may be required to participate in any work dealing with suspended loads, including CTD deployment and recovery. The ship does not provide safety-toed shoes/boots. The ship's Operations Officer should be consulted by the Chief Scientist to ensure members of the scientific party report aboard with the proper attire.

D. Communications

A progress report on operations prepared by the Chief Scientist may be relayed to the program office. Sometimes it is necessary for the Chief Scientist to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually accommodate the Chief Scientist. Special radio voice communications requirements should be listed in the project instructions. The ship's primary means of communication with the Marine Operations Center is via email and the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required and it must be arranged through the ship's Commanding Officer at least 30 days in advance.

E. IT Security

Any computer that will be hooked into the ship's network must comply with the *OMAO Fleet IT Security Policy 1.1* (November 4, 2005) prior to establishing a direct connection to the NOAA WAN. Requirements include, but are not limited to:

- (1) Installation of the latest virus definition (.DAT) file on all systems and performance of a virus scan on each system.
- (2) Installation of the latest critical operating system security patches.
- (3) No external public Internet Service Provider (ISP) connections.

Completion of the above requirements prior to boarding the ship is required.

Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA's IT Security Awareness Course within 3 days of embarking.

F. Foreign National Guests Access to OMAO Facilities and Platforms

All foreign national access to the vessel shall be in accordance with NAO 207-12 and RADM De Bow's March 16, 2006 memo (<http://deemedexports.noaa.gov>). National Marine Fisheries Service personnel will use the Foreign National Registration System (FNRS) to submit requests for access to NOAA facilities and ships. The Departmental Sponsor/NOAA (DSN) is responsible for obtaining clearances and export licenses and for providing escorts required by the NAO. DSNs should consult with their designated Line Office Deemed Export point of contact to assist with the process.

Foreign National access must be sought not only for access to the ship involved in the project but also for any Federal Facility access (NOAA Marine Operations Centers, NOAA port offices, USCG Bases) that foreign nationals might have to traverse to gain access to and from the ship. The following are basic requirements.

Full compliance with NAO 207-12 is required.

Responsibilities of the Chief Scientist:

1. Provide the Commanding Officer with the email generated by the Servicing Security Office granting approval for the foreign national guest's visit. (For NMFS-sponsored guests, this email will be transmitted by FNRS.) This email will identify the guest's DSN and will serve as evidence that the requirements of NAO 207-12 have been complied with.
2. Escorts – The Chief Scientist is responsible to provide escorts to comply with NAO 207-12 Section 5.10, or as required by the vessel's DOC/OSY Regional Security Officer.

3. Ensure all non-foreign national members of the scientific party receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the Servicing Security Office.
4. Export Control - Ensure that approved controls are in place for any technologies that are subject to Export Administration Regulations (EAR).

The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

Responsibilities of the Commanding Officer:

1. Ensure only those foreign nationals with DOC/OSY clearance are granted access.
2. Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for anti-terrorism (AT) reasons and individuals from Cuba or Iran without written approval from the Director of the Office of Marine and Aviation Operations and compliance with export and sanction regulations.
3. Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.
4. Ensure receipt from the Chief Scientist or the DSN of the FNRS or Servicing Security Office email granting approval for the foreign national guest's visit.
5. Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.
6. Export Control - 8 weeks in advance of the project, provide the Chief Scientist with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Chief Scientist of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Chief Scientist can take steps to prevent unlicensed export of Program controlled technology. The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.
7. Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the Servicing Security Office.

Responsibilities of the Foreign National Sponsor:

1. Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.
2. The DSN of the foreign national shall assign an on-board Program individual, who will be responsible for the foreign national while on board. The identified individual must be a U.S. citizen and a NOAA or DOC employee. According to DOC/OSY, this requirement cannot be altered.
3. Ensure completion and submission of Appendix C (Certification of Conditions and Responsibilities for a Foreign National)

VIII. Appendices (all that apply)

1. Figures, maps, tables, images, etc.

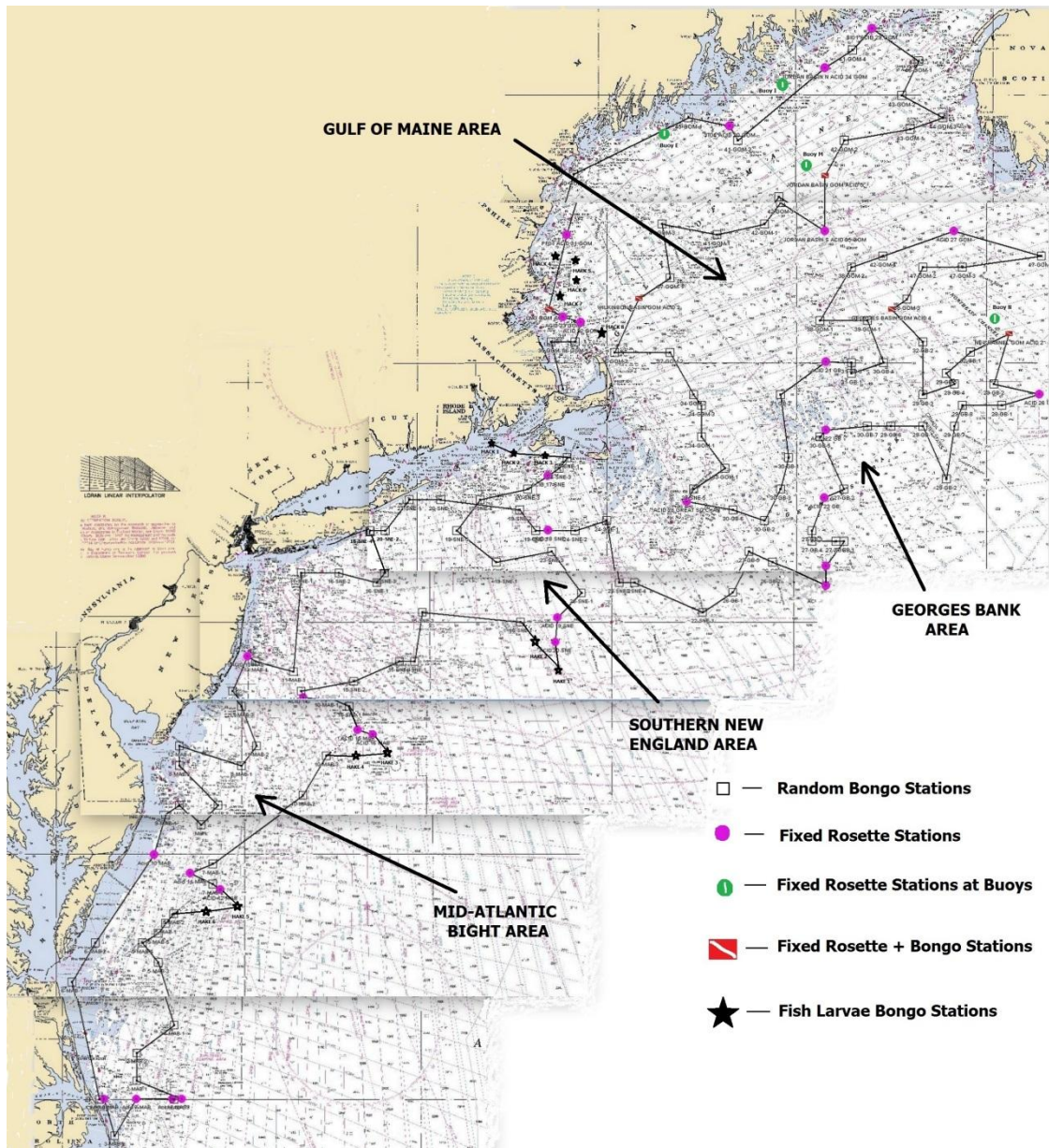


Figure 1. Station locations and proposed cruise track for GU 16-08 Ecosystem Monitoring Survey 21 May – 3 June 2016.

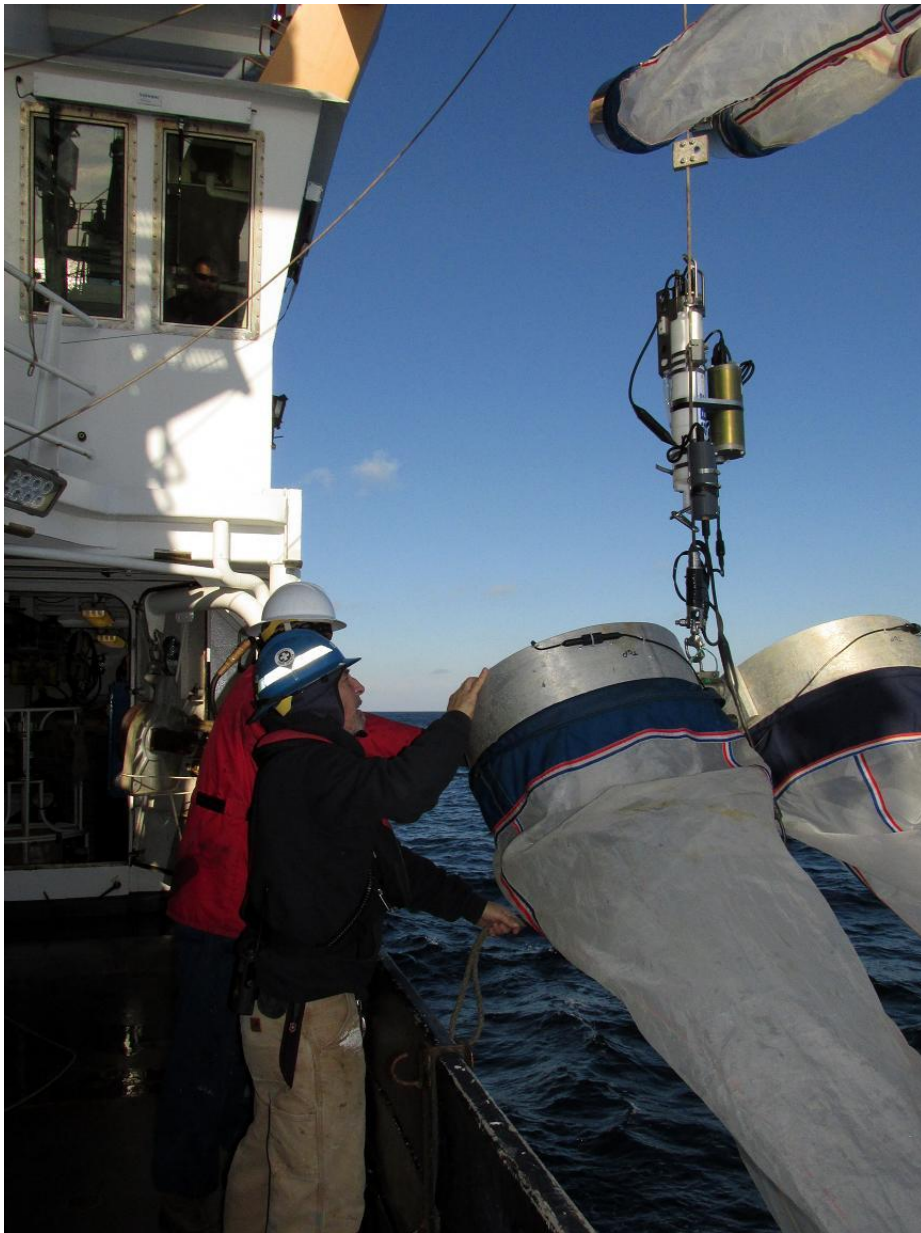


Figure 2. Plankton net sampling array, showing 61 and 20 cm bongo frames, and CTD unit.



Figure 3. A Niskin bottle rosette sampler equipped with 10 liter Niskin bottles.



Figure 4. The cylindrical Imaging FlowCytobot unit.

Table 1. Station/Waypoint List (coordinates in Latitude, Longitude: degree-minutes)

Name	Region	Strata	Deployment	Protocol	Latitude		Longitude	
					Degrees	Minutes	Degrees	Minutes
1-MAB-1	MAB	1	CTD/Bongo	STD	35	59.976	74	45.030
2-MAB-1	MAB	2	CTD/Bongo	STD	36	9.972	75	10.020
2-MAB-2	MAB	2	CTD/Bongo	STD	36	24.966	75	10.020
3-MAB-1	MAB	3	CTD/Bongo	STD	35	59.976	75	35.010
3-MAB-2	MAB	3	CTD/Bongo	STD	35	39.984	75	25.014
4-MAB-1	MAB	4	CTD/Bongo	STD	36	39.960	74	45.030
5-MAB-1	MAB	5	CTD/Bongo	STD	37	24.942	74	50.028
5-MAB-2	MAB	5	CTD/Bongo	STD	37	29.940	74	45.030
5-MAB-3	MAB	5	CTD/Bongo	STD	37	4.950	74	55.026
5-MAB-4	MAB	5	CTD/Bongo	STD	37	14.946	75	5.022
5-MAB-5	MAB	5	CTD/Bongo	STD	37	19.944	74	55.026
6-MAB-1	MAB	6	CTD/Bongo	STD	36	54.954	75	50.004
6-MAB-2	MAB	6	CTD/Bongo	STD	37	14.946	75	35.010
7-MAB-1	MAB	7	CTD/Bongo	STD	37	54.930	74	20.040
7-MAB-2	MAB	7	CTD/Bongo	STD	37	44.934	74	20.040
8-MAB-1	MAB	8	CTD/Bongo	STD	38	44.910	74	0.048
8-MAB-2	MAB	8	CTD/Bongo	STD	38	44.910	74	40.032
8-MAB-3	MAB	8	CTD/Bongo	STD	38	24.918	74	15.042
8-MAB-4	MAB	8	CTD/Bongo	STD	38	24.918	74	40.032
9-MAB-1	MAB	9	CTD/Bongo	STD	38	19.920	74	50.028
10-MAB-1	MAB	10	CTD/Bongo	STD	39	19.896	73	5.070
10-MAB-2	MAB	10	CTD/Bongo	STD	38	29.916	73	20.064
10-MAB-3	MAB	10	CTD/Bongo	STD	38	49.908	73	5.070
11-MAB-1	MAB	11	CTD/Bongo	STD	39	34.890	73	30.060
11-MAB-2	MAB	11	CTD/Bongo	STD	38	54.906	73	50.052
11-MAB-3	MAB	11	CTD/Bongo	STD	39	14.898	74	0.048
11-MAB-4	MAB	11	CTD/Bongo	STD	39	24.894	73	25.062
12-MAB-1	MAB	12	CTD/Bongo	STD	38	54.906	74	40.032
13-MAB-1	MAB	13	CTD/Bongo	STD	39	39.888	73	55.050
13-MAB-2	MAB	13	CTD/Bongo	STD	39	24.894	74	10.044
14-SNE-1	SNE	14	CTD/Bongo	STD	39	39.888	72	10.092
15-SNE-1	SNE	15	CTD/Bongo	STD	39	14.898	72	50.076
15-SNE-2	SNE	15	CTD/Bongo	STD	39	29.892	72	50.076
15-SNE-3	SNE	15	CTD/Bongo	STD	40	4.878	72	5.094
15-SNE-4	SNE	15	CTD/Bongo	STD	39	39.888	72	20.088
16-SNE-1	SNE	16	CTD/Bongo	STD	40	19.872	72	35.082
16-SNE-2	SNE	16	CTD/Bongo	STD	40	24.870	73	0.072
16-SNE-3	SNE	16	CTD/Bongo	STD	40	24.870	72	30.084
16-SNE-4	SNE	16	CTD/Bongo	STD	40	39.864	72	30.084
17-SNE-1	SNE	17	CTD/Bongo	STD	40	24.870	73	25.062
18-SNE-1	SNE	18	CTD/Bongo	STD	39	59.880	71	0.120
19-SNE-1	SNE	19	CTD/Bongo	STD	40	24.870	71	10.116
19-SNE-2	SNE	19	CTD/Bongo	STD	40	49.860	70	55.122
19-SNE-3	SNE	19	CTD/Bongo	STD	40	39.864	70	45.126

19-SNE-4	SNE	19	CTD/Bongo	STD	40	54.858	71	20.112
19-SNE-5	SNE	19	CTD/Bongo	STD	40	39.864	71	35.106
20-SNE-1	SNE	20	CTD/Bongo	STD	40	54.858	71	45.102
20-SNE-2	SNE	20	CTD/Bongo	STD	40	39.864	72	20.088
20-SNE-3	SNE	20	CTD/Bongo	STD	40	59.856	70	50.124
21-SNE-1	SNE	21	CTD/Bongo	STD	40	54.858	72	5.094
22-SNE-1	SNE	22	CTD/Bongo	STD	40	4.878	69	0.168
23-SNE-1	SNE	23	CTD/Bongo	STD	40	14.874	70	20.136
23-SNE-2	SNE	23	CTD/Bongo	STD	40	19.872	69	55.146
23-SNE-3	SNE	23	CTD/Bongo	STD	40	29.868	70	35.130
23-SNE-4	SNE	23	CTD/Bongo	STD	40	19.872	69	45.150
23-SNE-5	SNE	23	CTD/Bongo	STD	40	59.856	69	5.166
24-SNE-1	SNE	24	CTD/Bongo	STD	40	44.862	70	0.144
24-SNE-2	SNE	24	CTD/Bongo	STD	40	39.864	70	20.136
24-SNE-3	SNE	24	CTD/Bongo	STD	41	9.852	70	30.132
25-SNE-1	SNE	25	CTD/Bongo	STD	41	14.850	70	25.134
26-GB-1	GB	26	CTD/Bongo	STD	40	14.874	68	40.176
26-GB-2	GB	26	CTD/Bongo	STD	40	24.870	68	15.186
27-GB-1	GB	27	CTD/Bongo	STD	40	34.866	67	30.204
27-GB-2	GB	27	CTD/Bongo	STD	40	59.856	67	30.204
27-GB-3	GB	27	CTD/Bongo	STD	40	39.864	67	50.196
27-GB-4	GB	27	CTD/Bongo	STD	40	34.866	67	50.196
27-GB-5	GB	27	CTD/Bongo	STD	40	29.868	68	30.180
27-GB-6	GB	27	CTD/Bongo	STD	40	34.866	67	35.202
28-GB-1	GB	28	CTD/Bongo	STD	41	39.840	65	50.244
28-GB-2	GB	28	CTD/Bongo	STD	41	4.854	66	25.230
29-GB-1	GB	29	CTD/Bongo	STD	41	29.844	66	40.224
29-GB-2	GB	29	CTD/Bongo	STD	41	49.836	65	55.242
29-GB-3	GB	29	CTD/Bongo	STD	41	44.838	66	40.224
29-GB-4	GB	29	CTD/Bongo	STD	41	49.836	66	20.232
29-GB-5	GB	29	CTD/Bongo	STD	41	54.834	66	25.230
29-GB-6	GB	29	CTD/Bongo	STD	41	29.844	67	0.216
29-GB-7	GB	29	CTD/Bongo	STD	41	29.844	66	20.232
29-GB-8	GB	29	CTD/Bongo	STD	41	39.840	66	15.234
30-GB-1	GB	30	CTD/Bongo	STD	41	14.850	68	5.190
30-GB-2	GB	30	CTD/Bongo	STD	40	44.862	68	20.184
30-GB-3	GB	30	CTD/Bongo	STD	40	59.856	68	10.188
30-GB-4	GB	30	CTD/Bongo	STD	41	59.832	67	5.214
30-GB-5	GB	30	CTD/Bongo	STD	41	24.846	67	45.198
30-GB-6	GB	30	CTD/Bongo	STD	40	49.860	68	40.176
30-GB-7	GB	30	CTD/Bongo	STD	41	29.844	67	15.210
31-GB-1	GB	31	CTD/Bongo	STD	41	54.834	67	25.206
31-GB-2	GB	31	CTD/Bongo	STD	41	44.838	68	10.188
31-GB-3	GB	31	CTD/Bongo	STD	41	59.832	67	25.206
32-GB-1	GB	32	CTD/Bongo	STD	42	4.830	66	10.236
32-GB-2	GB	32	CTD/Bongo	STD	42	9.828	66	40.224
33-GOM-1	GOM	33	CTD/Bongo	STD	41	9.852	68	45.174
34-GOM-1	GOM	34	CTD/Bongo	STD	41	24.846	69	0.168
34-GOM-2	GOM	34	CTD/Bongo	STD	41	44.838	69	5.166

34-GOM-3	GOM	34	CTD/Bongo	STD	41	39.840	69	0.168
35-GOM-1	GOM	35	CTD/Bongo	STD	42	9.828	70	35.130
36-GOM-1	GOM	36	CTD/Bongo	STD	42	9.828	70	20.136
36-GOM-2	GOM	36	CTD/Bongo	STD	42	4.830	69	55.146
37-GOM-1	GOM	37	CTD/Bongo	STD	42	39.816	69	20.160
37-GOM-2	GOM	37	CTD/Bongo	STD	42	4.830	69	20.160
38-GOM-1	GOM	38	CTD/Bongo	STD	42	19.824	67	45.198
38-GOM-2	GOM	38	CTD/Bongo	STD	42	44.814	67	25.206
38-GOM-3	GOM	38	CTD/Bongo	STD	42	29.820	66	50.220
39-GOM-1	GOM	39	CTD/Bongo	STD	42	19.824	67	15.210
40-GOM-1	GOM	40	CTD/Bongo	STD	43	24.798	70	15.138
41-GOM-1	GOM	41	CTD/Bongo	STD	42	59.808	68	50.172
41-GOM-2	GOM	41	CTD/Bongo	STD	43	39.792	68	35.178
41-GOM-3	GOM	41	CTD/Bongo	STD	43	4.806	69	25.158
41-GOM-4	GOM	41	CTD/Bongo	STD	44	19.776	67	25.206
42-GOM-1	GOM	42	CTD/Bongo	STD	43	4.806	68	20.184
42-GOM-2	GOM	42	CTD/Bongo	STD	43	39.792	67	30.204
42-GOM-3	GOM	42	CTD/Bongo	STD	43	14.802	68	10.188
42-GOM-4	GOM	42	CTD/Bongo	STD	42	49.812	67	5.214
43-GOM-1	GOM	43	CTD/Bongo	STD	43	44.790	66	50.220
43-GOM-2	GOM	43	CTD/Bongo	STD	43	59.784	66	55.218
44-GOM-3	GOM	44	CTD/Bongo	STD	43	49.788	66	30.228
45-GOM-1	GOM	45	CTD/Bongo	STD	43	49.788	69	5.166
46-GOM-1	GOM	46	CTD/Bongo	STD	44	14.778	66	45.222
47-GOM-1	GOM	47	CTD/Bongo	STD	42	49.812	65	25.254
47-GOM-2	GOM	47	CTD/Bongo	STD	42	44.814	66	40.224
47-GOM-3	GOM	47	CTD/Bongo	STD	42	44.814	66	15.234
LNG (Acid 1)	GOM	36	CTD Profile 911+, CTD/Bongo	FXD/STD	42	25.008	70	36.797
Wilkinson Basin (Acid 3)	GOM	37	CTD Profile 911+, CTD/Bongo	FXD/STD	42	30.000	69	40.002
NE Ch (Acid 2)	GOM	38	CTD Profile 911+, CTD/Bongo	FXD/STD	42	13.500	65	46.002
Georges Basin (Acid 4)	GOM	39	CTD Profile 911+, CTD/Bongo	FXD/STD	42	22.420	67	2.675
Jordan Basin (Acid 5)	GOM	42	CTD Profile 911+, CTD/Bongo	FXD/STD	43	23.999	67	42.000
Acid 8 MAB	MAB	1	CTD Profile 911+	FXD	36	0.018	74	46.631
Acid 7 MAB	MAB	2	CTD Profile 911+	FXD	36	0.018	75	10.370
Acid 6 MAB	MAB	3	CTD Profile 911+	FXD	36	0.018	75	28.315
Acid 12 MAB	MAB	7	CTD Profile 911+	FXD	37	42.072	74	15.336
Acid 10 MAB	MAB	8	CTD Profile 911+	FXD	37	59.967	74	57.418
Acid 11 MAB	MAB	8	CTD Profile 911+	FXD	37	50.604	74	34.758
Acid 14 MAB	MAB	11	CTD Profile 911+	FXD	39	21.684	73	23.532
Acid 13 MAB	MAB	13	CTD Profile 911+	FXD	39	42.489	74	0.224
Acid 19 SNE	SNE	18	CTD Profile 911+	FXD	40	2.226	70	36.068
Acid 18 SNE	SNE	23	CTD Profile 911+	FXD	40	40.200	70	37.334
Great South Ch (Acid 28)	GOM	23	CTD Profile 911+	FXD	40	54.000	69	9.444
Acid 17 SNE	SNE	24	CTD Profile 911+	FXD	41	6.306	70	37.334
Acid 24 GB	GB	26	CTD Profile 911+	FXD	40	22.970	67	41.430
Acid 23 GB	GB	27	CTD Profile 911+	FXD	40	55.718	67	42.510
Acid 22 GB	GB	30	CTD Profile 911+	FXD	41	28.196	67	41.430
Acid 21 GB	GB	32	CTD Profile 911+	FXD	42	0.404	67	41.430
Acid 32 GOM	GOM	36	CTD Profile 911+	FXD	42	18.936	70	16.762

Acid 33 GOM	GOM	36	CTD Profile 911+	FXD	42	21.402	70	27.924
Jordan Basin S (Acid 35)	GOM	38	CTD Profile 911+	FXD	42	42.060	67	42.000
PF01 (Acid 26)	GOM	40	CTD Profile 911+	FXD	42	59.920	70	25.300
Jordan Basin N (Acid 34)	GOM	41	CTD Profile 911+	FXD	44	12.000	67	42.000
JT04 (Acid 30)	GOM	41	CTD Profile 911+	FXD	43	46.300	68	40.200
Acid 27 GOM	GOM	47	CTD Profile 911+	FXD	43	1.652	66	20.486
BI01 (Acid 29)	GOM	48	CTD Profile 911+	FXD	44	29.130	67	13.660
Acid 9 MAB	MAB	50	CTD Profile 911+	FXD	36	0.018	74	40.158
Acid 15 MAB	MAB	56	CTD Profile 911+	FXD	39	3.228	72	44.679
Acid 16 MAB	MAB	56	CTD Profile 911+	FXD	39	0.764	72	34.968
Acid 20 SNE	SNE	60	CTD Profile 911+	FXD	39	49.950	70	37.333
Acid 25 GB	GB	62	CTD Profile 911+	FXD	40	14.738	67	41.430
Acid 26 GB	GB	68	CTD Profile 911+	FXD	41	45.144	65	26.528
Buoy M Acid 36 GOM	GOM	42	CTD Profile 911+	FXD	43	29.44	67	52.76
Buoy N 0118 NE Chan	GOM	38	CTD Profile 911+	FXD	42	19.54	65	54.68
Buoy I 0130 east Maine shelf	GOM		CTD Profile 911+	FXD	44	6.37	68	6.57
Buoy E 0133 central Maine shelf	GOM		CTD Profile 911+	FXD	43	42.94	69	21.31
MACK 1	SNE		CTD/Bongo	STD	41	19.74	71	15.34
MACK 2	SNE		CTD/Bongo	STD	41	15.70	70	58.56
MACK 3	SNE		CTD/Bongo	STD	41	15.16	70	39.26
MACK 4	GOM		CTD/Bongo	STD	42	51.18	70	35.23
MACK 5	GOM		CTD/Bongo	STD	42	47.96	70	21.48
MACK 6	GOM		CTD/Bongo	STD	42	38.70	70	21.74
MACK 7	GOM		CTD/Bongo	STD	42	31.51	70	30.85
MACK 8	GOM		CTD/Bongo	STD	42	11.50	70	08.24
HAKE 1	SNE		CTD/Bongo	OTH	39	38.95	70	37.58
HAKE 2	SNE		CTD/Bongo	OTH	39	49.30	70	48.88
HAKE 3	MAB		CTD/Bongo	OTH	38	52.48	72	27.68
HAKE 4	MAB		CTD/Bongo	OTH	38	51.10	72	46.31
HAKE 5	MAB		CTD/BONGO	OTH	37	36.70	74	04.64
HAKE 6	MAB		CTD/BONGO	OTH	37	33.30	74	24.80

Appendix 2.

MSDS Forms for Chemicals being used during HB 16-02 Cruise.

1. Formaldehyde 37% Solution

CAS# 50-00-0

Code AC-4553

Formula weight

Supersedes

Not applicable.

FORMALDEHYDE

Not applicable.

Methylene oxide, AC-4553, AC-4554, 41860, 41883

For laboratory use only.

Anachemia Canada.

255 Norman.

Lachine (Montreal), Que

H8R 1A3

Section II. Ingredients

Material Safety Data Sheet

Synonyms

Chemical formula

Material uses

WHMIS Protective Clothing TDG Road/Rail

Section I. Product Identification and Uses

Not available.

Supplier

CI#

Product name

255 Norman.

Lachine (Montreal), Que

H8R 1A3

PIN: UN1198 PG: III

WHMIS CLASS: B-3 E D-1A D-2A TDG CLASS: 3 8

1) FORMALDEHYDE 50-00-0 30-40 Exposure limits: ACGIH Ceiling limit

0.3 ppm (0.37 mg/m3):

2) METHANOL 67-56-1 5-15 Exposure limits: ACGIH TWA 200

ppm (262 mg/m3) (skin); STEL 250

ppm (328 mg/m3) (skin)

3) WATER 7732-18-5 Balance Not established by ACGIH

FORMALDEHYDE:

ORAL (LD50): Acute: 100 mg/kg (Rat). 42 mg/kg (Mouse).

ORAL (LDLo): Acute: 108 mg/kg (Woman).

DERMAL (LD50): Acute: 270 ul/kg (Rabbit).

VAPOR (LC50): Acute: 203 mg/m3 (Rat). 454 mg/m3 (Mouse) (4 hour(s)).

METHANOL:

ORAL (LD50): Acute: 7300 mg/kg (Mouse). 14200 mg/kg (Rabbit).

DERMAL (LD50): Acute: 15800 mg/kg (Rabbit).

VAPOR (LC50): Acute: 64000 ppm (Rat) (4 hour(s)).

Toxicity values of the

hazardous ingredients

Name CAS # %

EMERGENCY NUMBERS:

(USA) CHEMTREC : 1(800) 424-9300 (24hrs)

(CAN) CANUTEC : 1(613) 996-6666 (24hrs)

(USA) Anachemia : 1(518) 297-4444

(CAN) Anachemia : 1(514) 489-5711

TLV

Section V. Toxicological Properties

May be fatal by ingestion, inhalation, or by skin absorption. Corrosive. Severe lachrymator. Target organs: central nervous system, liver, kidneys, spleen, eyes, skin, gastrointestinal system, respiratory system, lungs, reproductive system, peripheral nervous system, pancreas. 20 ppm (FORMALDEHYDE) is immediately dangerous to life or health.

Section III. Physical Data

Physical state and
appearance / Odor

Percent volatile
pH (1% soln/water)
Freezing point
Boiling point
Vapor pressure
Odor threshold
Specific gravity
Vapor density
Water/oil dist. coeff.
Evaporation rate

Solubility

100% (V/V)

2.8-4.0 (25°C) (37% Solution)

Insoluble polymer gradually forms.

90 to 100°C

1.08 to 1.0975 (Water = 1)

0.62 to 1.04 (Air = 1)

~40 mm of Hg (@ 39°C)

Not available.

2.1(n-Butyl acetate = 1) (Methanol).

Miscible in water.

0.8-1 ppm

Clear, colorless liquid with strong formaldehyde odor.

FORMALDEHYDE page 2/4

Auto-ignition temperature

Fire degradation

products

Flash point

Fire extinguishing

procedures

Flammable limits

Fire and Explosion

Hazards

299°C (For formaldehyde gas.)

CLOSED CUP: 50 to 78°C

LOWER: 7% (For formaldehyde gas.) UPPER: 73% (For formaldehyde gas.)

Use DRY chemical, carbon dioxide, alcohol-resistant foam or water spray. Wear adequate personal protection to prevent contact with material or its combustion products. Self contained breathing apparatus with a full facepiece operated in a pressure demand or other positive pressure mode. Cool containing vessels with flooding quantities of water until well after fire is out.

Combustible liquid. Vapor may travel considerable distance to source of ignition and flash back, eliminate all sources of ignition. Vapor forms explosive mixture with air. Container explosion may occur under fire conditions or when heated. Contact with oxidizers may cause fire and/or explosion. Sensitive to static discharge. The sensitivity to impact is not available. Emits toxic fumes under fire conditions.

Section IV. Fire and Explosion Data

Effects of Acute

Exposure

Routes of entry Inhalation and ingestion. Eye contact. Skin contact. Skin absorption.

Ingestion

Inhalation

Skin

Eye Vapors causes tearing and severe irritation. Liquid causes severe burns. Eye contact can result in corneal damage or blindness. IRRITATION: EYE-RABBIT 750 ug/24H SEVERE.

Causes severe burns. Prolonged and repeated contact causes hardening or tanning effect. May cause allergic dermatitis.

Liquid can be absorbed in toxic amounts through intact skin (massive skin contact can cause visual impairment and death). IRRITATION: SKIN-RABBIT 2 mg/24H SEVERE.

Highly toxic and corrosive. Vapors are extremely irritating to the nose, throat, lungs and mucous membranes. Bronchitis, bronchopneumonia, pulmonary edema and chemical pneumonitis may occur. Prolonged exposure may result in more severe irritation and tissue damage. Methanol can cause central nervous system depression (signs and symptoms may include headache, dizziness, nausea, vomiting, drowsiness and incoordination), coughing, chest pain and dyspnea. Can affect the optic nerve resulting in blindness. Can cause liver, kidney, and lung damage. See ingestion and chronic effects. Highly toxic. Vapors, mists, and liquid is corrosive to the mouth and throat and stomach. Swallowing the liquid inflames the tissues, causes severe abdominal pain, nausea, vomiting, hematuria, proteinuria, anuria, acidosis, and possible loss of consciousness. Methanol can affect the optic nerve resulting in blindness. See inhalation and chronic effects.

Oxides of carbon (CO, CO₂).

Section VI. First Aid Measures

Section V. Toxicological Properties

Reaction with hydrochloric acid may form bis-chloromethyl ether which is a confirmed human carcinogen according to ACGIH and carcinogenic to humans according to IARC. Hazardous polymerization will not occur.

If conscious, wash out mouth with water. DO NOT induce vomiting. Seek immediate medical attention. Never give anything by mouth to an unconscious or convulsing person. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus.

Hazardous decomp.

products

Stability

Incompatibility

Stable. Conditions to avoid: heat, sparks and flame, temperatures below 20°C.

Not available.

May react violently with: acids, alkalis, anhydrides, isocyanates, urea, phenol, oxidizing agents, oxides, organic oxides, reducing agents, ammonia, aniline, magnesium carbonate, performic acid, alkali metals, amines, hydrogen peroxide, nitromethane, nitrogen dioxide, perchloric acid, perchloric acid-aniline mixtures, bases, monomers, water reactive materials, magnesium carbonate hydroxide.

Section VII. Reactivity Data

Reaction Products

FORMALDEHYDE page 3/4

Immediate first aid is needed to prevent eye damage. IMMEDIATELY flush eyes with copious quantities of water for at least 20 minutes holding lids apart to ensure flushing of the entire surface. Seek immediate medical attention. DO NOT use an eye ointment.

Remove patient to fresh air. Administer approved oxygen supply if breathing is difficult. Administer artificial respiration or CPR if breathing has ceased. Seek immediate medical attention.

Eye contact

Skin contact

Inhalation

Ingestion

Immediate first aid is needed to prevent skin damage. Immediately flush skin with plenty of water for at least 20 minutes while removing contaminated clothing and shoes. Seek immediate medical attention. Wash contaminated clothing before reusing.

Effects of Chronic

Overexposure

Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs. Rats chronically exposed to 14 ppm formaldehyde contracted nasal cancers. Based on animal data and limited epidemiological evidence, NTP, IARC and OSHA have listed formaldehyde as a probable human carcinogen. Possible reproductive disorders from prolonged exposure (embryotoxic). Mutagen. Passes through the placental barrier in animal. May cause sensitization by inhalation (asthma) and skin contact (dermatitis). Can cause central nervous system depression. May cause damage to the central nervous system, respiratory system, lungs, eyes, skin, gastrointestinal tract, liver, spleen, and kidneys. Repeated or prolonged exposure to the substance can produce target organs damage.

While the company believes the data set forth herein are accurate as of the date hereof, the company makes no warranty with respect thereto

and expressly disclaims all liability for reliance thereon. Such data are offered solely for your consideration, investigation and verification.

Section X. Other Information

Waste disposal

Storage and Handling

Spill and leak

Protective Clothing in

case of spill and leak

According to all applicable regulations. Harmful to aquatic life at low concentrations. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

Evacuate and ventilate the area. Stay upwind: Keep out of low areas. Eliminate all sources of ignition. Dyke the area with sand or a natural barrier. Absorb on sand or vermiculite and place in a closed container for disposal. Use non-sparking tools. Transport outdoors. Wash spill site after material pick up is complete. DO NOT empty into drains. DO NOT touch damaged container or spilled material. Runoff to sewer may create fire or explosion hazard.

Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Full suit.

Store in a cool place away from heated areas, sparks, and flame. Store in a well ventilated area. Store away from incompatible materials.

Do not add any other material to the container. Do not wash down the drain. Do not breathe gas/fumes/vapor/spray. In case of

insufficient ventilation, wear suitable respiratory equipment. Keep container tightly closed. Manipulate under an adequate fume hood.

Take precautionary measures against electrostatic discharges. Ground the container while dispensing. Ground all equipment containing

material. Use explosion proof equipment. Use non-sparking tools. Watch for accumulation in low confined areas. Do not use pressure

to dispense. Storage temperature depends on methanol content and should be controlled to avoid precipitation or vaporization. Low

temperature storage results in formation of paraformaldehyde, while high temperature storage produces formic acid. Keep away from

direct sunlight or strong incandescent light. Empty containers may contain a hazardous residue. Handle and open container with care.

Take off immediately all contaminated clothing. This product must be manipulated by qualified personnel. Do not get in eyes, on skin, or

on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking and food consumption

while handling.

Section VIII. Preventive Measures **FORMALDEHYDE page 4/4**

Splash goggles. Impervious gloves, apron, coveralls, and/or other resistant protective clothing. Sufficient to protect skin. A OSHA/MSHA jointly approved respirator is advised in the absence of proper environmental controls. If more than TLV, do not breathe vapor. Wear self-contained breathing apparatus. Have available and use as appropriate: face shields, rubber suits, aprons, and boots. Do not wear contact lenses. Make eye bath and emergency shower available. Ensure that eyewash station and safety shower is proximal to the work-station location.

Section IX. Protective Measures

Engineering controls Use in a chemical fume hood to keep airborne levels below recommended exposure limits. Use explosion-proof ventilation equipment. Do not use in unventilated spaces.

Protective clothing

Prepared by MSDS Department/Département de F.S.. Validated 16-May-2012

Telephone# (514) 489-5711

Combustible liquid! Corrosive! Highly toxic! Carcinogen! Mutagen! Sensitizer!

Embryotoxic! Risk of serious damage to eyes. Lachrymator. Possible risks of irreversible

effects. Readily absorbed through skin. Do not breathe vapor. Avoid all contact with the product. Avoid prolonged or repeated exposure. Use in a chemical fume hood. Keep away from heat, sparks and flame. Use non-sparking tools. Handle and open container with care. Container should be opened only by a technically qualified person.

Synergistic materials: Alcohols may interact synergistically with chlorinated solvents (example: carbon tetrachloride, chloroform, bromotrichloromethane), dithiocarbamates (example: disulfiram), dimethylnitrosamine and thioacetamide. Formaldehyde: ethyl acetate.

RTECS NO: LP8925000 (Formaldehyde).

RTECS NO: PC1400000 (Methanol).

Special Precautions or comments

3

2

0

NFPA

2. Ethyl Alcohol 95% Solution

MATERIAL SAFETY DATA SHEETS

SECTION I PRODUCT AND COMPANY IDENTIFICATION

190 Proof Ethyl Alcohol 7/2014

Synonyms: Ethyl Alcohol 95%; Ethanol; Spirits
Formula: C₂H₅OH
Manufacturer: Warner Graham Company
160 Church Lane
Cockeysville, Maryland 21030, USA
Phone (410)667-6200 Fax (410) 6280-617
Emergency Contact: CHEMTREC 1-800-424-9300

SECTION II COMPOSITION /INFORMATION ON INGREDIENTS

%wt	Material	CAS	Exposure	Limits
92.5(95% v/v)	Ethanol	64-17-5	1000ppm	TWA6.15
	Water 7	732-18-5		None established

SECTION III HAZARDS IDENTIFICATION

Carcinogen Status: Not classifiable as a human carcinogen

Routes of Exposure:

Swallowing: May cause dizziness, faintness, drowsiness decreased awareness or responsiveness, nausea, vomiting, staggering gait, lack of coordination, and coma.

Skin Absorption: No harmful affects with normal skin.

Inhalation: High vapor concentration may cause burning sensation in nose and throat and stinging and watering in the eyes. At concentrations which cause irritation, dizziness, faintness, drowsiness, nausea and vomiting may also occur.

Skin Contact: No evidence of harmful effects from available information.

Eye Contact: May cause irritation including stinging, tearing, and redness.

Effects of Repeated Overexposure: Long term repeated oral exposure to ethanol may result in the development of progressive liver injury with fibrosis

Other Health Hazards: Repeated ingestion of ethanol by pregnant mothers has been shown to adversely affect the central nervous system of the fetus, producing a collection of effects which together constitute fetal alcohol syndrome. These include mental and physical retardation, disturbances of learning, motor and language deficiencies, behavioral disorders and small size head.

Medical Conditions Aggravated by Overexposure: Repeated exposure to ethanol may aggravate liver injury produced from other causes.

SECTION IV

FIRST AID

Obtain medical attention for all cases of over-exposure.

Swallowing: If patient is fully conscious, give two glasses of water. Induce vomiting. Obtain medical attention.

Skin: Wash skin with soap and water for at least 15 minutes.

Inhalation: Remove to fresh air; Give artificial respiration if not breathing; If breathing is difficult oxygen may be given by qualified personnel; Obtain medical assistance is discomfort persists.

Eyes: Flush eyes with water for at least 15 minutes. Obtain medical assistance.

Note to Physician: Symptoms vary with alcohol level of the blood. Mild alcohol intoxication occurs at blood levels between 0.5-.15%. Approximately 25% of individuals show signs of intoxication at these levels. Above .15% the person is definitely under the influence of ethanol; 50-95% of individuals are clinically intoxicated at these levels. Severe poisoning occurs when the blood is ethanol level is 0.3- 0.5%. Above 0.5% the individual will be comatose and death can occur. The unabsorbed ethanol should be removed by gastric lavage after intubating the patient to prevent aspiration. Avoid the use of depressant drugs or the excessive administration of fluids.

SECTION V

FIRE FIGHTING MEASURES

Fire/Explosive Properties

Flash Point: 60F (16C) Tag Closed Cup 68F (18C) Tag Open Cup

Flammable Limits in Air: 3.3 - 19.0% (by volume) for 100% ethanol

Flammability Classification: 3 (NFPA)

1993 Emergency Response Guidebook: Guide 26

1996 North American Emergency Response Guidebook: Guide 127

Extinguishing Media: Apply alcohol-type or all-purpose foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

Special Fire Fighting Procedures: Use water spray to cool fire-exposed containers and structures; Use water spray to disperse vapors - re-ignition is possible; Use self-contained breathing apparatus and protective clothing.

Unusual Fire and Explosion Hazards:

- ♦ Vapors may travel to source of ignition and flash back.
- ♦ Vapors may settle in low or confined spaces.
- ♦ May produce a floating fire hazard.
- ♦ Static ignition hazard can result from handling and use.

SECTION VI

SPILL/ACCIDENTAL RELEASE MEASURES

Small spills can be flushed with large amounts of water.

Large spills: Eliminate all ignition sources; ground all equipment; do not walk through spill; stop spill if possible; prevent entry into sewers, confined spaces, etc.; use a vapor suppressing foam to reduce vapors; absorb spill with noncombustible matter and transfer to containers; use non-sparking tools to collect absorbed material.

SECTION VII HANDLING AND STORAGE

♦ **Flammable material** - keep away from heat, sparks, and flame; sudden releases of hot organic vapors or mists from process equipment operating at elevated temperature may result in ignitions without the presence of obvious ignition sources.

- ♦ *Avoid contact with eyes.*
- ♦ *Keep container closed.*
- ♦ *Use with adequate ventilation.*
- ♦ *Ground container when transferring product.*
- ♦ *Vapors may collect in containers; treat empty containers as hazardous.*
- ♦ *Wash thoroughly after handling.*
- ♦ *Vapors may settle in low or confined areas.*

SECTION VIII

EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation: Special, local ventilation is needed where vapors escape to the workplace air

Respiratory Protection: Use self-contained breathing apparatus in high vapor concentration.

Personal Protective Equipment: gloves, lab coat or uniform, safety glasses, eyewash, safety shower.

SECTION IX

PHYSICAL AND CHEMICAL PROPERTIES

Appearance: clear, colorless liquid

Odor: characteristic

Vapor pressure @ 20C: 41.4 mm Hg for 100% ethanol

Vapor density: 1.6 (air =1)

Boiling point @ 760mm Hg: 78C

Freezing Point: -118

Solubility in Water: 100% @ 20C

Specific Gravity : .815 @ 15.56C

Density @ 15.56C (60F): 6.8 lbs/gal

Evaporation Rate: 3.0 (butyl acetate = 1)

Percent Volatiles: 100%

SECTION X

STABILITY/REACTIVITY INFORMATION

Stability: Stable

Conditions to avoid: None known

Incompatibility/Materials to avoid: strong oxidizing agents; strong inorganic acids

Hazardous Combustion/Decomposition Products: Carbon monoxide and/or carbon dioxide

Hazardous Polymerization: Will not occur

SECTION XI DISPOSAL CONSIDERATIONS

Vapors may collect in empty containers. Treat empty containers as hazardous.

Dispose of spill-clean up and other wastes in accordance with Federal, State, and local regulations.

SECTION XII

TRANSPORTATION INFORMATION

Proper Shipping Name: Ethyl Alcohol

Hazard Class: 3

UN Number: 1170

IMO Information: Ethanol or ethanol solutions

Class: 3.2 - Flammable Liquids, Packing Group II, Intermediate flashpoint group

SECTION XIII

REGULATORY INFORMATION

Federal EPA

Comprehensive Environmental Response Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release quantities of Hazardous Substances equal to or greater than the reportable quantities (RQs) in CFR.

Components present in this product at a level which could require reporting under this statute are:

Chemical CAS Number Upper Bound Conc. %

Acetaldehyde 75-07-0 .0019

Acetone 67-64-1 .0002

Methanol 67-56-1 .0144

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on threshold planning quantities and release reporting based on reportable quantities in 40 CFR 355 (used for SARA 302, 304, 311, and 312).

Components present in this product at a level which could require reporting under this statute are: none.

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III

requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDS's that are copied and distributed for this material. Components present in this product at a level which could require reporting under the statute are: none.

Toxic Substances Control Act (TSCA) Status: The ingredients of this product are on the TSCA inventory.

State Right to Know

California Proposition 65: This product contains trace levels of acetaldehyde known to the State of California to cause cancer.

Massachusetts: Hazardous substances and extraordinarily hazardous substances must be identified. Components present which could require

reporting:

Extraordinarily Hazardous (\Rightarrow 0.0001%): Acetaldehyde (CAS 75-07-0)

upper bound conc. .0019%

Hazardous (\Rightarrow 1%): Ethanol (CAS 64-17-5) upper bound conc. 93.85%

Pennsylvania: Hazardous substances must be identified.

Hazardous (\Rightarrow 1%): Ethanol

California SCAQMD Rule 443.1 (VOC's)

A Volatile Organic Compound (VOC) is any volatile compound of carbon excluding methane, carbon monoxide, carbonic acid, metallic carbides, or carbonates, ammonium carbonate, 1,1,1 tri-chloroethane, methylene chloride, (FC-23), (CFC-113), (CFC-12), (CFC-11), (CFC-22), (CFC-

114) and (CFC-115). VOC 800g/l; vapor pressure 1.4 mm Hg @20C

<p>The information contained herein is based on data considered to be accurate. However, no warranty is expressed regarding the accuracy of the data or the results to be obtained from the use thereof. It is the user's obligation</p>
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3. Acetone



SAFETY DATA SHEET

Creation Date **28-Apr-2009**

Revision Date **12-Mar-2014**

Revision Number **1**

1. Identification

Product Name

Acetone

Cat No. : AC177170000; AC177170010; AC177170025; AC177170050; AC177170100;
AC177170250

Synonyms **2-Propanone**

Recommended Use **Laboratory chemicals.**

Uses advised against **No Information available**

Details of the supplier of the safety data sheet

1. Identification

Company
**Fisher Scientific One Reagent Lane
Fair Lawn, NJ 07410 Tel: (201) 796-7100**

1. Identification

Entity / Business Name
**Acros Organics One Reagent Lane
Fair Lawn, NJ 07410**

1. Identification

Emergency Telephone Number
**For information US call: 001-800-ACROS-01
/ Europe call: +32 14 57 52 11
Emergency Number US:001-201-796-7100 /
Europe: +32 14 57 52 99
CHEMTREC Tel. No.US:001-800-424-9300 /
Europe:001-703-527-3887**

1. Identification

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, spleen, Blood.	

Label Elements

1. Identification

2. Hazard(s) identification

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
Causes serious eye irritation
May cause drowsiness or dizziness
May cause damage to organs through prolonged or repeated exposure

1. Identification

2. Hazard(s) identification

Page 1 / 8

Acetone

Revision Date **12-Mar-2014**



Precautionary Statements Prevention

Wash face, hands and any exposed skin thoroughly after handling Do not breathe dust/fume/gas/mist/vapors/spray Use only outdoors or in a well-ventilated area Keep away from heat/sparks/open flames/hot surfaces. - No smoking Keep container tightly closed Ground/bond container and receiving equipment Use explosion-proof electrical/ventilating/lighting/equipment Use only non-sparking tools Take precautionary measures against static discharge Wear protective gloves/protective clothing/eye protection/face protection Keep cool

Response

Get medical attention/advice if you feel unwell

Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing Call a POISON CENTER or doctor/physician if you feel unwell

Skin

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing If eye irritation persists: Get medical advice/attention

Fire

In case of fire: Use CO2, dry chemical, or foam for extinction

Storage

Store in a well-ventilated place. Keep container tightly closed Store locked up

Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Repeated exposure may cause skin dryness or cracking

3. Composition / information on ingredients

Component	CAS-No	Weight %
Acetone	67-64-1	>95

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

3. Composition / information on ingredients

4. First-aid measures

Skin Contact

3. Composition / information on ingredients

4. First-aid measures

Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

3. Composition / information on ingredients

4. First-aid measures

Inhalation Move to fresh air. If breathing is difficult, give oxygen. Get medical attention immediately if symptoms occur.

3. Composition / information on ingredients

4. First-aid measures

Ingestion Do not induce vomiting. Obtain medical attention.

3. Composition / information on ingredients

4. First-aid measures

Most important symptoms/effects **Breathing difficulties.** Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting; May cause pulmonary edema: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media CO₂, dry chemical, dry sand, alcohol-resistant foam. Water spray. Cool closed containers exposed to fire with water spray.

Unsuitable Extinguishing Media Water may be ineffective

Flash Point -20 °C / -4 °F
Method - Closed cup

Autoignition Temperature 465 °C / 869 °F
Explosion Limits
Upper 12.8 vol %
Lower 2.5 vol %
Oxidizing Properties Not oxidising

Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Flammable. Risk of ignition. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

Hazardous Combustion Products

Carbon monoxide (CO) Carbon dioxide (CO₂) Formaldehyde Methanol

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

5. Fire-fighting measures

NFPA

5. Fire-fighting measures

Health
1

5. Fire-fighting measures

Flammability
3

5. Fire-fighting measures

Instability
0

5. Fire-fighting measures

Physical hazards
N/A

5. Fire-fighting measures

6. Accidental release measures

Personal Precautions Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and inhalation of vapors.

Environmental Precautions Should not be released into the environment.

Methods for Containment and Clean Remove all sources of ignition. Take precautionary measures against static discharges.

5. Fire-fighting measures

6. Accidental release measures

Up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Use spark-proof tools and explosion-proof equipment.

5. Fire-fighting measures

6. Accidental release measures

7. Handling and storage

Handling

Wear personal protective equipment. Ensure adequate ventilation. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. Use only non-sparking tools. Use explosion-proof equipment. Do not breathe vapors or spray mist. Do not get in eyes, on skin, or on clothing. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

5. Fire-fighting measures

6. Accidental release measures

7. Handling and storage

Storage

Flammables area. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Keep container tightly closed in a dry and well-ventilated place.

Acetone

Revision Date 12-Mar-2014

8. Exposure controls / personal protection

Exposure Guidelines

8. Exposure controls / personal protection

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Acetone	TWA: 500 ppm STEL: 750 ppm	(Vacated) TWA: 750 ppm (Vacated) TWA: 1800 mg/m ³ (Vacated) STEL: 2400 mg/m ³ (Vacated) STEL: 1000 ppm TWA: 1000 ppm TWA: 2400 mg/m ³	IDLH: 2500 ppm TWA: 250 ppm TWA: 590 mg/m ³

Component	Quebec	Mexico OEL (TWA)	Ontario TWAEV
Acetone	TWA: 500 ppm TWA: 1190 mg/m ³ STEL: 1000 ppm STEL: 2380 mg/m ³	TWA: 1000 ppm TWA: 2400 mg/m ³ STEL: 1260 ppm STEL: 3000 mg/m ³	TWA: 500 ppm STEL: 750 ppm

Legend

8. Exposure controls / personal protection

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures

Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations

and safety showers are close to the workstation location. Use explosion-proof electrical/ventilating/lighting/equipment.

Personal Protective Equipment

8. Exposure controls / personal protection

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

8. Exposure controls / personal protection

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

8. Exposure controls / personal protection

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

8. Exposure controls / personal protection

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	sweet
Odor Threshold	19.8 ppm
pH	7
Melting Point/Range	-95 °C / -139 °F
Boiling Point/Range	56 °C / 132.8 °F
Flash Point	-20 °C / -4 °F
Method -	Closed cup
Evaporation Rate	5.6 (Butyl Acetate = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	12.8 vol %
Lower	2.5 vol %
Vapor Pressure	247 mbar @ 20 °C
Vapor Density	2.0
Relative Density	0.790
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available

8. Exposure controls / personal protection

9. Physical and chemical properties

Autoignition Temperature	465 °C / 869 °F
Decomposition Temperature	> 4°C
Viscosity	0.32 mPa.s @ 20 °C
Molecular Formula	C3 H6 O
Molecular Weight	58.08
Refractive index	1.358 - 1.359

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions.
Conditions to Avoid	Heat, flames and sparks. Incompatible products. Keep away from open flames, hot surfaces and sources of ignition.
Incompatible Materials	Strong oxidizing agents, Strong reducing agents, Strong bases, Peroxides, Halogenated compounds, Alkali metals, Amines
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO ₂), Formaldehyde, Methanol
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

10. Stability and reactivity

11. Toxicological information

Acute Toxicity

10. Stability and reactivity

11. Toxicological information

Product Information Component Information

10. Stability and reactivity

11. Toxicological information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Acetone	5800 mg/kg (Rat)	> 15800 mg/kg (rabbit) > 7400 mg/kg (rat)	76 mg/l, 4 h, (rat)

Toxicologically Synergistic Products

10. Stability and reactivity

11. Toxicological information

Carbon tetrachloride; Chloroform; Trichloroethylene; Bromodichloromethane; Dibromochloromethane; N-nitrosodimethylamine; 1,1,2-Trichloroethane; Styrene; Acetonitrile, 2,5-Hexanedione; Ethanol; 1,2-Dichlorobenzene

10. Stability and reactivity

11. Toxicological information

Delayed and immediate effects as well as chronic effects from short and long-term exposure

10. Stability and reactivity

11. Toxicological information

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

10. Stability and reactivity

11. Toxicological information

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Acetone	67-64-1	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)

10. Stability and reactivity

11. Toxicological information

STOT - repeated exposure

10. Stability and reactivity

11. Toxicological information

Kidney Liver spleen Blood

10. Stability and reactivity

11. Toxicological information

Aspiration hazard

10. Stability and reactivity

11. Toxicological information

No information available

10. Stability and reactivity

11. Toxicological information

Symptoms / effects, both acute and Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting:

10. Stability and reactivity

11. Toxicological information

Acetone

Revision Date 12-Mar-2014

delayed **May cause pulmonary edema: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting**

Endocrine Disruptor Information **No information available**

Other Adverse Effects **Neurotoxic effects have occurred in experimental animals.**

12. Ecological information

Ecotoxicity

.

12. Ecological information

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Acetone	NOEC = 430 mg/l (algae; 96 h)	Oncorhynchus mykiss: LC50 = 5540 mg/l 96h Alburnus alburnus: LC50 = 11000 mg/l 96h Leuciscus idus: LC50 = 11300 mg/L/48h Salmo gairdneri: LC50 = 6100 mg/L/24h	EC50 = 14500 mg/L/15 min	EC50 = 8800 mg/L/48h EC50 = 12700 mg/L/48h EC50 = 12600 mg/L/48h

Persistence and Degradability **Persistence is unlikely based on information available.**

Bioaccumulation/ Accumulation **No information available.**

Mobility **Will likely be mobile in the environment due to its volatility.**

12. Ecological information

Component	log Pow
Acetone	-0.24

13. Disposal considerations

Waste Disposal Methods **Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.**

12. Ecological information

13. Disposal considerations

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Acetone - 67-64-1	U002	-

14. Transport information

DOT

UN-No	UN1090
Proper Shipping Name	ACETONE
Hazard Class	3
Packing Group	II

TDG

UN-No	UN1090
Proper Shipping Name	ACETONE
Hazard Class	3
Packing Group	II

IATA

UN-No	UN1090
Proper Shipping Name	ACETONE
Hazard Class	3
Packing Group	II

IMDG/IMO

UN-No	UN1090
Proper Shipping Name	ACETONE
Hazard Class	3
Packing Group	II

12. Ecological information

13. Disposal considerations

14. Transport information

15. Regulatory information

12. Ecological information

13. Disposal considerations

14. Transport information

15. Regulatory information

International Inventories

12. Ecological information

13. Disposal considerations

14. Transport information

Acetone

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Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Acetone	X	X	-	200-662-2	-		X	X	X	X	X

Legend: X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA. F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA. S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) **Not applicable**

SARA 313 **Not applicable**

SARA 311/312 Hazardous Categorization

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	Yes
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act **Not applicable**

Clean Air Act **Not applicable**

OSHA Occupational Safety and Health Administration Not applicable

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Acetone	5000 lb	-

California Proposition 65 **This product does not contain any Proposition 65 chemicals**

State Right-to-Know

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Acetone	X	X	X	-	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N

DOT Severe Marine Pollutant N

U.S. Department of Homeland Security

This product contains the following DHS chemicals:

Component	DHS Chemical Facility Anti-Terrorism Standard
Acetone	2000 lb STQ

Other International Regulations

Mexico - Grade

Serious risk, Grade 3

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class

**B2
Flam
mable
liquid
D2B
Toxic
mater
ials**



16. Other information

Prepared By

Regulatory

**Affair
s
Ther
mo
Fishe
r
Scient
ific**

Email: EMSDS.RA@thermofisher.com

Creation Date

28-Apr-2009

Revision Date

12-Mar-2014

Print Date

12-Mar-2014

Revision Summary

This document has been updated to comply with the US OSHA HazCom 2012

Standard

replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer

The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of SDS



Material Safety Data Sheet Mercuric Chloride Solutions

Section 1 - Chemical Product and Company Identification

MSDS Name:

Mercuric Chloride Solutions

Catalog Numbers:

LC16600, LC16620

Synonyms:

None

Company Identification:

LabChem Inc
200 William Pitt Way Pittsburgh,
PA 15238

Company Phone Number:

(412) 826-5230

Emergency Phone Number:

(800) 424-9300

CHEMTREC Phone Number:

(800) 424-9300 or 011-703-527-3887

Section 2 – Composition, Information on Ingredients

CAS#	Chemical Name:	Percent
7732-18-5	Water	balance
7487-94-7	Mercuric chloride	5-6.5

Section 3 - Hazards Identification

Emergency Overview

Appearance: clear, colorless solution

Danger! May be fatal if swallowed or absorbed through the skin. May cause eye and skin irritation and possible burns. May cause respiratory and digestive tract irritation. May cause kidney damage, allergic skin reaction, and central nervous system effects. May impair fertility and cause harm to the unborn child.

Target Organs: kidneys, central nervous system, reproductive system.

Potential Health Effects

Eye:

May cause severe eye irritation and possible burns. May cause ulceration of the conjunctiva and cornea. Exposure to mercury or mercury compounds can cause discoloration on the front surface of the lens, which does not interfere with vision.

Skin:

May be fatal if absorbed through the skin. Causes severe skin irritation and possible burns. May cause allergic contact dermatitis.



Material Safety Data Sheet Mercuric Chloride Solutions

Ingestion:

May be fatal if swallowed. Causes gastrointestinal irritation and possible burns with nausea, vomiting and diarrhea. May cause muscle tremor and impaired motor function. May cause cardiac disturbances.

Inhalation:

May cause central nervous system effects including vertigo, anxiety, depression, muscle incoordination, and emotional instability. May cause gastrointestinal effects including gum and mouth inflammation, jaw necrosis, and loosening of the teeth. May cause burns to the respiratory tract. Acute exposure to high concentrations of mercury vapors may cause severe respiratory tract irritation.

Chronic:

Chronic exposure to mercury may cause permanent central nervous system damage, fatigue, weight loss, tremors, and personality changes. Prolonged ingestion may cause metallic taste, gingivitis, pyorrhea with loosening teeth, gastrointestinal tract disorders, kidney and liver disorders. Prolonged or repeated skin contact may cause dermatitis. May cause reproductive and fetal effects. Chronic ingestion may cause accumulation of mercury in body tissues. Laboratory experiments have resulted in mutagenic effects. May be rapidly transferred across the placenta and cause adverse fetal effects.

Section 4 - First Aid Measures

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids until no evidence of chemical remains. Get medical aid at once.

Skin:

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid at once.

Ingestion:

Give conscious victim 2-4 cupfuls of milk or water. Get medical aid at once.

Inhalation:

Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid at once.

Notes to Physician:

The concentration of mercury in whole blood is a reasonable measure of the body-burden of mercury and thus is used for monitoring purposes. Persons with kidney disease, chronic respiratory disease, liver disease, or skin disease may be at increased risk from exposure to this substance.

Antidote:

The use of Dimercaprol, BAL (British Anti-Lewisite), or d-Penicillamine as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media:

For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam.



Material Safety Data Sheet
Mercuric Chloride Solutions

Autoignition Temperature:

No information found.

Flash Point:

No information found.

NFPA Rating:

CAS# 7732-18-5: Health- 0, Flammability- 0, Instability- 0.

CAS# 7487-94-7: Health- 4, Flammability- 0, Instability- 0.

Explosion Limits:

Lower: n/a Upper: n/a

Section 6 - Accidental Release Measures

General Information:

Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spills with absorbent (vermiculite, sand, fuller's earth) and place in suitable containers labeled for later disposal. Keep out of sewers and drains.

Section 7 - Handling and Storage

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only with adequate ventilation. Extreme care should always be taken to prevent skin and gastrointestinal absorption because these routes of entry can greatly increase the total body burden and are often overlooked in occupational settings.

Storage:

Store in a tightly closed container. Keep away from food and drinking water. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Facilities using or storing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits:

Chemical Name:	ACGIH	NIOSH	OSHA
Water	None of the components are on this list.	None of the components are on this list.	None of the components are on this list.
Mercuric chloride	0.025 mg/m ³ TWA (as Hg) (listed under Mercury inorganic compounds)	0.05 mg/m ³ TWA (vapor, as Hg) (listed under Mercury compounds) 0.1 mg/m ³ IDLH (as Hg) (listed under Mercury compounds)	None of the components are on this list.

OSHA Vacated PELs:

None.



Personal Protective Equipment

Eyes:

Do not wear contact lenses when working with chemicals. Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State:	Clear liquid
Color:	Colorless
Odor:	Odorless
pH:	4-5
Vapor Pressure:	No information found.
Vapor Density:	No information found.
Evaporation Rate:	No information found.
Viscosity:	No information found.
Boiling Point:	> 212°F (> 100°C)
Freezing/Melting Point:	< 32°F (< 0°C)
Decomposition Temperature:	No information found.
Solubility in water:	Soluble
Specific Gravity/Density:	1.2
Molecular Formula:	No information found.
Molecular Weight:	No information found.

Section 10 - Stability and Reactivity

Chemical Stability:

Stable under normal temperatures and pressures.

Conditions to Avoid:

Incompatible materials.

Incompatibilities with Other Materials:

Strong oxidizing agents, strong bases, ammonia, copper, iron, silver salts, potassium, antimony, sodium, lead, hypophosphites, formates, sulfites, phosphates, albumin, gelatin, alkalis, alkaloid salts, lime water, arsenic, bromides, borax, carbonates, reduced iron, infusions of cinchona, columbo, oak bark or senna, tannic acid, metallic halides, vegetable astringents.

Hazardous Decomposition Products:

Mercury, mercury oxides.

Hazardous Polymerization:

Has not been reported.



Section 11 - Toxicological Information

RTECS:

CAS# 7732-18-5: ZC0110000.

CAS# 7487-94-7: OV9100000.

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg.

CAS# 7487-94-7:

Oral, mouse: LD50 = 6 mg/kg

Oral, rat: LD50 = 1 mg/kg Skin,

rat: LD50 = 41 mg/kg.

Carcinogenicity:

CAS# 7732-18-5: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65.

CAS# 7487-94-7: Listed as Group 3 (Not classifiable as to carcinogenicity) by IARC.

Epidemiology:

See entry in the Documentation of the Threshold Limit Values and Biological Exposure Indices issued by ACGIH.

Teratogenicity:

Mercuric chloride has been embryotoxic, fetotoxic, and teratogenic in experimental animals, and has affected fertility in male mice. Inorganic mercury has been implicated in male impotence, menstrual disorders, and spontaneous abortions in humans.

Reproductive:

Data clearly indicate that mercury can affect both male & female reproductive outcomes. It has not been possible to unequivocally determine a safe exposure level for protection of reproduction function in either male or female workers, particularly since many studies didn't adequately evaluate dermal exposure. Those planning to have children should keep their exposure to mercury as low as possible by engineering controls, personal protective equipment for skin & respiratory tract, & good personal hygiene.

Mutagenicity:

No information found

Neurotoxicity:

No information found

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 0.903 mg/L; 24 Hr; Unspecified Fish:

Fathead Minnow: LC50 = 0.037 mg/L; 48 Hr; Unspecified

Fish: Bluegill/Sunfish: LC50 = 0.16 mg/L; 96 Hr; Static at 13.5-16.2°C (pH 7.1-7.3) Water

flea Daphnia: LC50 = 0.093 mg/L; 48 Hr; Unspecified

Section 13 - Disposal Considerations

Dispose of in accordance with Federal, State, and local regulations.



Material Safety Data Sheet Mercuric Chloride Solutions

Section 14 - Transport Information

US DOT

Shipping Name: Mercury compounds, liquid, n.o.s. (Mercuric chloride)
Hazard Class: 6.1
UN Number: UN2024
Packing Group: PG II

Section 15 - Regulatory Information

US Federal

TSCA:

CAS# 7732-18-5 is listed on the TSCA Inventory. CAS# 7487-94-7 is listed on the TSCA Inventory.

SARA Reportable Quantities (RQ):

None of the components are on this list.

CERCLA/SARA Section 313:

This material contains Mercury(II) chloride (listed as Mercury compounds), 5-6.5%, (CAS# 7487- 94-7), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

OSHA - Highly Hazardous:

None of the components are on this list.

US State

State Right to Know:

Mercuric chloride can be found on the following state Right-to-Know lists: New Jersey, Florida, Pennsylvania, Massachusetts, California (listed as Mercury compounds).

California Regulations:

WARNING: This product contains Mercury(II) chloride, listed as 'Mercury compounds', a chemical known to the state of California to cause birth defects or other reproductive harm.

European/International Regulations

Canadian DSL/NDSL:

CAS# 7732-18-5 is listed on Canada's DSL List. CAS# 7487-94-7 is listed on Canada's DSL List.

Canada Ingredient Disclosure List:

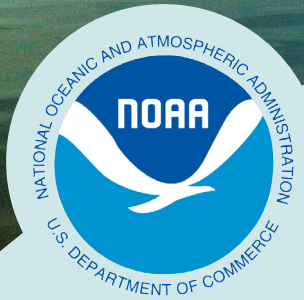
CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List. CAS# 7487-94-7 is listed on Canada's Ingredient Disclosure List.

Section 16 - Other Information

MSDS Creation Date: February 17, 1998

Revision Date: October 11, 2011

Information in this MSDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc. assumes no liability resulting from the use of this MSDS. The user must determine suitability of this information for his application.



NOAA FISHERIES

Pre-cruise Actions

1. Whether onboard a NOAA, chartered, or partner vessel, prior to the cruise, communicate, and coordinate with vessel crew about established protected species incidental take reporting and handling procedures.
2. Ensure regional pertinent protected resources staff are in the PSIT email alert notification list.
3. The NMFS cruise Chief Scientist or Designee shall contact the appropriate Regional Stranding Network and query about additional numbers or specific contacts to reach in case of an incidental take of a marine mammal.

Contact

For any PSIT* or NMFS protected species incidental research take protocol queries, contact:

Dr. Mridula Srinivasan, NMFS
Office of Science and Technology
301.427.8179
mridula.srinivasan@noaa.gov

Procedures & Actions for Incidental Takes of Marine Mammals in Research & Monitoring Activities

(applies to surveys on NOAA and charter vessels and partner surveys)

Context

While research conducted by NOAA or through NOAA sponsorship is undertaken to support NOAA's various missions, these activities must still comply with applicable statutes and regulations, including those relating to takes of marine mammals under the Marine Mammal Protection Act. When NOAA activities cause a take of a marine mammal, the cruise senior scientist or designee, should take the following actions.

Key Actions

1. Notify the geographically appropriate Regional Stranding Network Coordinator (contact information in this document) immediately following the incidental take of a marine mammal.
2. Regional Stranding Network Coordinator will immediately contact the Office of Law Enforcement (OLE).
3. For live injured/uninjured marine mammals, priority should be to release the animal before notifying Regional Stranding Networks.
4. For dead animals, maximum efforts should be made to retain carcass and coordinate transfer to the Regional Stranding Network.
5. If Coordinators are unreachable, collect pertinent Protected Species Incidental Take (PSIT) information and release animal or retain carcass if logistically feasible.
6. In all cases, within 48 hours of any take, designated NMFS staff shall submit take-related information to the **PSIT Main – NOAA** (website: www.st.nmfs.noaa.gov/finss/psit/psitMain.jsp). Attach narrative, photos, and completed data forms.

*PSIT – Protected Species Incidental Take Database

What to Do with a **Live, Injured or Uninjured** Marine Mammal?

If a live, injured or uninjured marine mammal is incidentally captured, the animal should be released immediately. In the event of a large entangled whale, immediately call your regional entanglement response network.

1. Considering human safety, work from the vessel as quickly and carefully as possible to free the animal from the gear. Ensure the animal can continue to breathe while freeing from the gear.
2. If it can be done immediately without further harming the animal, photograph the animal (dorsal and ventral sides including dorsal fin, flanks, head/jaw) prior to and after removal of gear and collect required PSIT information. Research/biological sampling of marine mammals is not permitted without an appropriate Take Authorization.
3. If animal is NOT brought aboard the vessel and taking photos is not an option, provide a comprehensive summary of the incident following requirements described under 'PSIT narrative' in this document.
4. Notify Regional Stranding Network Coordinator immediately after the incident.
5. **Submit take information to PSIT within 48 hours and attach any forms, photos, and narrative to the take record within a week of the event.**

What to Do with a **Dead** Marine Mammal?

1. Notify Regional Stranding Network Coordinator about the take of a dead marine mammal.
2. Based on any prior discussions with the Regional Stranding Network and importantly, after considering logistics and human safety, make all efforts to haul animal aboard the vessel and retained for pickup by the local Regional Stranding Network. Develop a plan with Regional Stranding Network Coordinator for carcass pickup and subsequent necropsy.

If the animal cannot be hauled aboard or picked up by the Regional Stranding Network Coordinator, as a last resort, release animal after necessary information is collected as described below.

3. Photos of the carcass should be taken: dorsal fin, ventral side, and flank for marine mammals, as well as signs of entanglement, scars, and injuries. This also includes collecting required PSIT data and morphometric measurements.
4. Submit take information to PSIT within 48 hours and attach any forms, photos, and narrative to the take record within one week of the event.
5. Research/biological sampling of marine mammals is not permitted without an appropriate Take Authorization.

What to Do with **All** Marine Mammals?

In addition to the required PSIT information (date, gear, location, etc.) please complete a narrative which includes the following information. A completed narrative is essential for serious injury determinations.

1. Animal Condition (include photos)

Code 1 Live Animal	Code 2 Fresh Dead	Code 3 Moderate Decomposition	Code 4 Advanced Decomposition
---------------------------------	--------------------------------	--	--

2. Mention if animal escaped or was released.
3. Indicate if the animal or other marine mammals were seen in the vicinity of the vessel during fisheries operations.
4. Animal condition post-release: Describe any observed injuries, the condition and behavioral state of released or injured animal (e.g., no obvious injuries and animal swam away vigorously, did not swim away vigorously, animal surfaced to breathe, animal sank to bottom, or blood in water observed).
5. If gear was still attached to animal after release, describe how the gear was cut and approximately how much gear is left and where it is still entangled/injured.
6. Provide comprehensive photographic evidence (if possible) and written description of live/dead or injured animal. Provide pictures of how the animal was entangled in the gear, and any gear-related interactions such as wounds or constrictions.
7. Decision-making: Include rationale for any discretionary decisions taken by Chief Scientist/crew.
8. Describe possible causes for incidental capture of the animal and any additional mitigation measures that were taken, or might be taken to prevent similar captures in the future.

Regional Stranding Response Coordinator 24/7 Hotline Numbers

(for marine mammals) are provided below. The relevant number should be included in your cruise plan and posted on the ship for easy access.

For all non-marine mammal takes, designated personnel shall report takes to PSIT within 48 hours of take.

Northeast Region	1.866.755.6622
Southeast Region	1.877.433.8299
Western Region	1.866.767.6114
Pacific Islands Region	1.888.256.9840
Alaska Region	1.877.925.7773
	<p>NMFS Stranding Coordinators Aleria Jensen 907.586.7248 and Barbara Mahoney 907.271.3448 (cell – after hours 907.360.3481)</p> <p>General NMFS Protected Resources Office Line 907.586.7235 Kate Wynne (NMFS Kodiak) 907.486.1517</p>

Entanglement Response Network Numbers

Southeast Region	1.877.433.8299 or 1.877.942.5343
Northeast Region	1.866.755.6622 For large whale entanglements can also contact USCG via Channel 16.
Western Region	1.877.767.9425 (877-SOS-WHALE)
Pacific Islands Region	1.888.256.9840
Alaska Region	1.877.925.7773

APPENDIX B

Sea turtle and resuscitation measures as found at 50 CFR 223.206(d)(1).

(d) (1) (i) Any specimen taken incidentally during the course of fishing or scientific research activities must be handled with due care to prevent injury to live specimens, observed for activity, and returned to the water according to the following procedures.

(A) Sea turtles that are actively moving or determined to be dead as described in (d)(1)(i)(C) of this section must be released over the stern of the boat. In addition, they must be released only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels.

(B) Resuscitation must be attempted on sea turtles that are comatose, or inactive, as determined in paragraph (d)(1) of this section by:

(1) placing the turtle on its bottom shell (plastron) so that the turtle is right side up, and elevating its hindquarters at least 6 inches (15.2 cm) for a period of 4 up to 24 hours. The amount of the elevation depends on the size of the turtle; greater elevations are needed for larger turtles. Periodically, rock the turtle gently left to right and right to left by holding the outer edge of the shell (carapace) and lifting one side about 3 inches (7.6 cm) then alternate to the other side. Gently touch the eye and pinch the tail (reflex test) periodically to see if there is a response.

(2) sea turtles being resuscitated must be shaded and kept damp or moist but under no circumstance be placed into a container holding water. A water-soaked towel placed over the head, neck, and flippers is the most effective method in keeping a turtle moist.

(3) sea turtles that revive and become active must be released over the stern of the boat only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels. Sea turtles that fail to respond to the reflex test or fail to move within 4 hours (up to 24, if possible) must be returned to the water in the same manner as that for actively moving turtles.

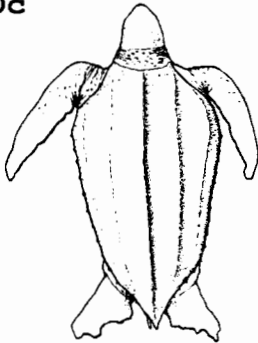
(C) A turtle is determined to be dead if the muscles are stiff (rigor mortis) and/or the flesh has begun to rot; otherwise the turtle is determined to be comatose or inactive and resuscitation attempts are necessary.

APPENDIX C

Identification Key for Sea Turtles and Sturgeon Found in Northeast U.S. Waters

SEA TURTLES

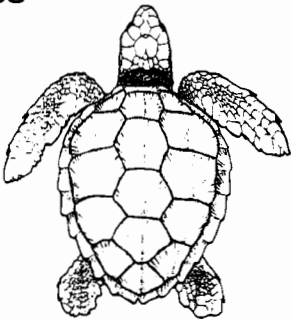
Dc



Leatherback (*Dermochelys coriacea*)

Found in open water throughout the Northeast from spring through fall. Leathery shell with 5-7 ridges along the back. Largest sea turtle (4-6 feet). Dark green to black; may have white spots on flippers and underside.

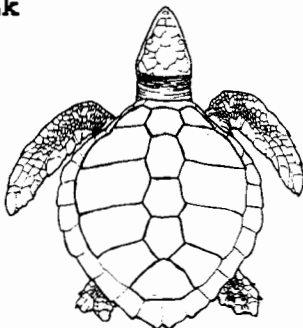
Cc



Loggerhead (*Caretta caretta*)

Bony shell, reddish-brown in color. Mid-sized sea turtle (2-4 feet). Commonly seen from Cape Cod to Hatteras from spring through fall, especially in southern portion of range. Head large in relation to body.

Lk

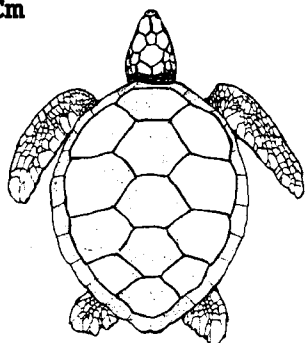


Kemp's ridley (*Lepidochelys kempi*)

Most often found in Bays and coastal waters from Cape Cod to Hatteras from summer through fall. Offshore occurrence undetermined. Bony shell, olive green to grey in color. Smallest sea turtle in Northeast (9-24 inches). Width equal to or greater than length.

APPENDIX C, continued (Identification Key)

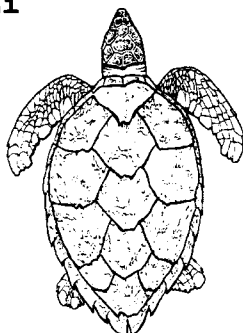
Cm



Green turtle (*Chelonia mydas*)

Uncommon in the Northeast. Occur in Bays and coastal waters from Cape Cod to Hatteras in summer. Bony shell, variably colored; usually dark brown with lighter stripes and spots. Small to mid-sized sea turtle (1-3 feet). Head small in comparison to body size.

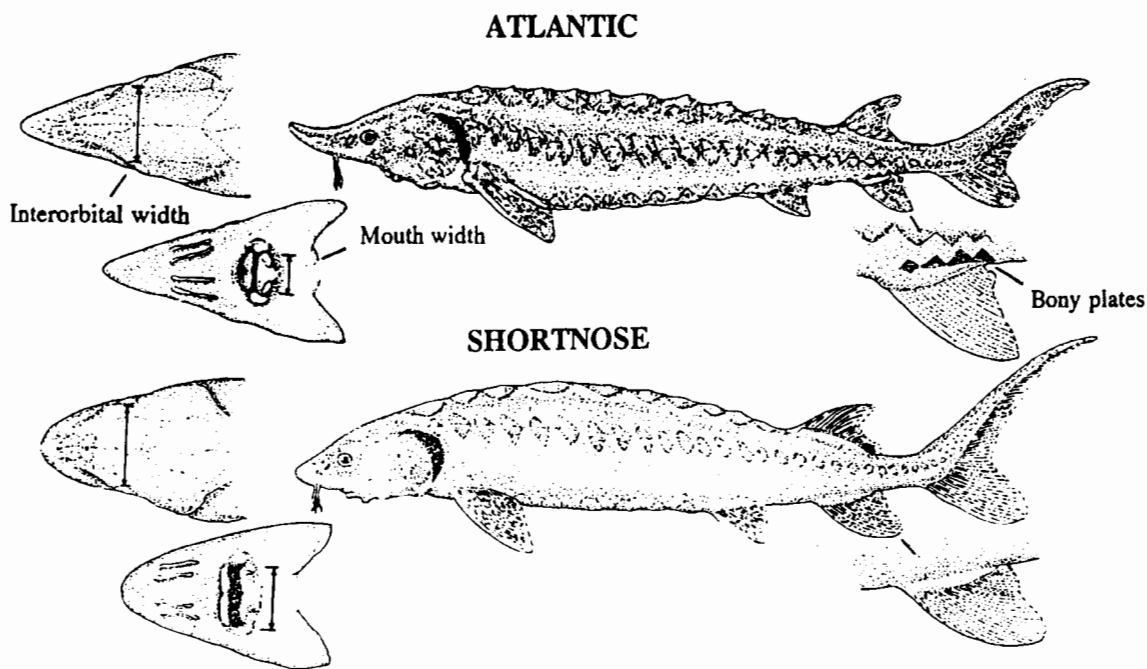
Ei



Hawksbill (*Eretmochelys imbricata*)

Rarely seen in Northeast. Elongate bony shell with overlapping scales. Color variable, usually dark brown with yellow streaks and spots (tortoise-shell). Small to mid-sized sea turtle (1-3 feet). Head relatively small, neck long.

APPENDIX C continued
Sturgeon Identification



Distinguishing Characteristics of Atlantic and Shortnose Sturgeon

Characteristic	Atlantic Sturgeon, <i>Acipenser oxyrinchus</i>	Shortnose Sturgeon, <i>Acipenser brevirostrum</i>
Maximum length	> 9 feet/ 274 cm	4 feet/ 122 cm
Mouth	Football shaped and small. Width inside lips < 55% of bony interorbital width	Wide and oval in shape. Width inside lips > 62% of bony interorbital width
*Pre-anal plates	Paired plates posterior to the rectum & anterior to the anal fin.	1-3 pre-anal plates almost always occurring as median structures (occurring singly)
Plates along the anal fin	Rhombic, bony plates found along the lateral base of the anal fin (see diagram below)	No plates along the base of anal fin
Habitat/Range	Anadromous; spawn in freshwater but primarily lead a marine existence	Freshwater amphidromous; found primarily in fresh water but does make some coastal migrations

* From Vecsei and Peterson, 2004

APPENDIX D

Procedure for obtaining fin clips from sturgeon for genetic analysis

Obtaining Sample

1. Wash hands and use disposable gloves. Ensure that any knife, scalpel or scissors used for sampling has been thoroughly cleaned and wiped with alcohol to minimize the risk of contamination.
2. For any sturgeon, after the specimen has been measured and photographed, take a one-cm square clip from the pelvic fin.
3. Each fin clip should be placed into a vial of 95% non-denatured ethanol and the vial should be labeled with the species name, date, name of project and the fork length and total length of the fish along with a note identifying the fish to the appropriate observer report. All vials should be sealed with a lid and further secured with tape. Please use permanent marker and cover any markings with tape to minimize the chance of smearing or erasure.

Storage of Sample

1. If possible, place the vial on ice for the first 24 hours. If ice is not available, please refrigerate the vial. Send as soon as possible as instructed below.

Sending of Sample

1. Vials should be placed into Ziploc or similar resealable plastic bags. Vials should be then wrapped in bubble wrap or newspaper (to prevent breakage) and sent to:

Julie Carter
NOAA/NOS – Marine Forensics
219 Fort Johnson Road
Charleston, SC 29412-9110
Phone: 843-762-8547

- a. Prior to sending the sample, contact Russ Bohl at NMFS Northeast Regional Office (978-282-8493) to report that a sample is being sent and to discuss proper shipping procedures.

APPENDIX E

Incident Report: ESA Listed Species Take

Photographs should be taken and the following information should be collected from all listed fish and sea turtles (alive and dead) collected.

Observer's full name: _____

Reporter's full name: _____

Species Identification: _____

Type of Gear and Length of deployment:

Date animal observed: _____ Time animal observed: _____

Date animal collected: _____ Time animal collected: _____

Environmental conditions at time of observation (i.e., tidal stage, weather):

Water temperature (°C) at site and time of observation: _____

Describe location of animal and how it was documented (i.e., observer on boat):

Sturgeon Information:

Species _____

Fork length (or total length) _____ Weight _____

Condition of specimen/description of animal

Fish Decomposed: NO SLIGHTLY MODERATELY SEVERELY

Fish tagged: YES / NO *Please record all tag numbers.* Tag # _____

Photograph taken: YES / NO

(please label *species, date, geographic site* and *vessel name* when transmitting photo)

Genetics Sample taken: YES / NO

Genetics sample transmitted to: _____ on ____ / ____ /2012

APPENDIX E continued

Sea Turtle Species Information: *(please designate cm/m or inches.)*

Species _____ Weight (kg or lbs) _____

Sex (circle): Male Female Unknown How was sex determined? _____

Straight carapace length _____ Straight carapace width _____

Curved carapace length _____ Curved carapace width _____

Plastron length _____ Plastron width _____

Tail length _____ Head width _____

Condition of specimen/description of animal _____

Existing Flipper Tag Information

Left _____ Right _____

PIT Tag # _____

Miscellaneous:

Genetic biopsy taken: YES NO

Photos Taken: YES NO

Is this a Recapture: YES NO

Turtle Release Information:

Date _____ Time _____

Lat _____ Long _____

State _____ County _____

Remarks: (note if turtle was involved with tar or oil, gear or debris entanglement, wounds or mutilations, propeller damage, papillomas, old tag locations, etc.)



Standard Conditions Special Purpose - Salvage Permits 50 CFR 21.27

All of the provisions and conditions of the governing regulations at 50 CFR part 13 and 50 CFR 21.27 are conditions of your permit. Failure to comply with the conditions of your permit could be cause for suspension of the permit. The standard conditions below are a continuation of your permit conditions and must remain with your permit. If you have any questions regarding these conditions, refer to the regulations or, if necessary, contact your migratory bird permit issuing office. For copies of the regulations and forms, or to obtain contact information for your issuing office, visit: <http://www.fws.gov/migratorybirds/mbpermits.html>.

1. This permit does not authorize personal use of any migratory bird(s) salvaged under the authority of this permit.
2. You must tag each migratory bird specimen you collect or salvage. Each tag must include
 - (a) the date and location where the specimen was collected or salvaged, and
 - (b) the name of the person who collected or salvaged the the specimen.The permit number under which the specimen was collected or salvaged must be recorded in the permanent accession record.
3. All migratory birds salvaged under this permit must be deposited with the repository designated on the face of this permit within six (6) months of acquisition and/or by December 31 of that calendar year.
4. Salvaged migratory birds, including parts, nests, and nonviable eggs unsuitable for donation must be completely destroyed by burial or incineration.
5. If you encounter a migratory bird with a Federal band issued by the U.S. Geological Survey Bird Banding Laboratory, Laurel, MD, report the band number to 1-800-327-BAND or www.reportband.gov.
6. This permit does not authorize salvage of specimens on Federal lands without additional prior written authorization from the applicable Federal agency, or on State lands or other public or private property without prior written permission or permits from the landowner or custodian.
7. A subpermittee is an individual to whom you have provided written authorization to conduct some or all of the permitted activities in your absence. Subpermittees must be at least 18 years of age. As the permittee, you are legally responsible for ensuring that your subpermittees are adequately trained and adhere to the terms of your permit. You are responsible for maintaining current records of who you have designated as a subpermittee, including copies of designation letters you have provided. Other individuals, including those under the age of 18, may conduct the permitted activities only if you or a designated subpermittee are present.
8. You and any subpermittees must carry a legible copy of this permit and display it upon request when exercising its authority. Subpermittees must also carry your written subpermittee designation letter.
9. You must maintain records as required by 50 CFR 13.46 and 50 CFR 21.27. All records relating to the permitted activities must be kept at the location indicated in writing by you to the migratory bird permit issuing office.
10. Acceptance of this permit authorizes the U.S. Fish and Wildlife Service to inspect any wildlife held, and to audit or copy any permits, books, or records required to be kept by the permit and governing regulations.
11. You may not conduct the activities authorized by this permit if doing so would violate the laws of the applicable State, county, municipal or tribal government or any other applicable law.



DEPARTMENT OF THE INTERIOR
 U.S. FISH AND WILDLIFE SERVICE
 Migratory Bird Permit Office
 P.O. Box 779 - Hadley, MA 01035-0779
 Tel: 413-253-8643 Fax: 413-253-8424
 Email: permitsR5MB@fws.gov

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

NORTHEAST FISHERIES SCIENCE CENTER
 U.S. DEPARTMENT OF COMMERCE
 NATIONAL MARINE FISHERIES SERVICE
 166 WATER STREET
 WOODS HOLE, MA 02543
 U.S.A.

2. AUTHORITY-STATUTES
 16 USC 703-712

REGULATIONS
 50 CFR Part 13
 50 CFR 21.27

3. NUMBER
MB043513-0

4. RENEWABLE
 YES
 NO

5. MAY COPY
 YES
 NO

6. EFFECTIVE
 04/01/2015

7. EXPIRES
 03/31/2018

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*
 AMY MARTINS
 CHIEF, FISHERIES SAMPLING BRANCH

9. TYPE OF PERMIT
 SPECIAL PURPOSE - SALVAGE

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED

Includes the waters of the U.S. Northeastern Continental Shelf or the Northwest Atlantic Ocean, including the Gulf of Maine and Georges Bank, in addition to the waters off the States of Rhode Island south to North Carolina, from three miles from the coastline extending to the edge on the Continental Shelf, and including the waters of the northern Middle Atlantic Bight and the southern Middle Atlantic Bight.
 TEL: 508-495-2266

11. CONDITIONS AND AUTHORIZATIONS:

- A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.
- B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL, TRIBAL, OR OTHER FEDERAL LAW.
- C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

D. You are authorized to salvage migratory birds (except species listed as threatened or endangered under the Endangered Species Act; see 50 CFR 17.11) found dead that you had no part in the killing or death thereof. Any dead bald eagles or golden eagles salvaged must be reported within 48 hours to the National Eagle Repository at (303) 287-2110 and to the issuing migratory bird permit office at our fax number 413-253-8424. The Repository will provide directions for shipment of these specimens.

For a list of threatened and endangered species in your state, visit the U.S. Fish and Wildlife Service's Threatened and Endangered Species System (TESS) at: <http://www.fws.gov/endangered>.

E. You are authorized to salvage abandoned (unoccupied) migratory bird nests and nonviable eggs outside the nesting season, except for nests and eggs of bald eagles or golden eagles and threatened or endangered species.

F. All salvaged migratory bird specimens must be deposited with Northeast Fisheries Science Center, Woods Hole, MA for educational or scientific use only.

G. You may not salvage and must immediately report to the U.S. Fish and Wildlife Service Office of Law Enforcement any dead or injured migratory birds that appear to have been poisoned, shot, electrocuted, have collided with industrial power generation equipment, or were otherwise killed or injured as the result of potential criminal activity. See FWS OLE contact information below.

ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS

ANNUAL REPORT DUE 1/31 of each year (even if you had NO ACTIVITY)
 Annual Report Form can be found at: www.fws.gov/forms/3-202-9.pdf
 Application Form can be found at: www.fws.gov/forms/3-200-13.pdf

ISSUED BY

TITLE
 CHIEF, MIGRATORY BIRD PERMIT OFFICE - REGION 5

DATE
 03/09/2015

H. Any person who is

- (1) employed by or under contract to you for the activities specified in this permit, or
- (2) otherwise designated a subpermittee by you in writing, may exercise the authority of this permit.

I. You and any subpermittees must comply with the attached Standard Conditions for Special Purpose Salvage Permits. **These standard conditions are a continuation of your permit conditions *and must remain with your permit.***

For suspected illegal activity, immediately contact USFWS Law Enforcement at: Chelsea, MA 617-889-6616

Marine Mammal Data Collection Sheet

****Ensure the animal can continue to breathe, if conducting any disentanglement operations. Also, ALWAYS wear gloves when handling marine mammals; it is for your health and safety.****

Station #: _____

Species Name: _____

Condition at Capture (check one):

Alive uninjured Alive injured Fresh dead Decomposed Unresponsive

If the animal is brought on board and determined to be dead, if feasible, the specimen should be retained on board until the vessel reaches port and collected by the local Regional Stranding Coordinator

If the animal is NOT brought aboard the vessel, and taking photos is not an option, provide a comprehensive summary of the incident under the Protected Species Incidental Take (PSIT) Narrative on Page 4 of this form. Also, please complete narrative, regardless of whether the marine mammal is dead/alive or on board/not on board.

If the animal is brought on board ALIVE, and it is both safe and feasible to do so, use a CAMERA to obtain the following photos both PRIOR TO and AFTER freeing animal from any gear:

TOP of Animal

PHOTOS of any gear entanglement (if applicable)

PHOTOS of entire dorsal side:

While Entangled , After Disentanglement

PHOTOS of dorsal fin:

While Entangled , After Disentanglement

PHOTOS of head/jaw:

While Entangled , After Disentanglement

PHOTOS of flanks (sides):

While Entangled , After Disentanglement

PHOTOS of any injuries (if applicable):

While Entangled , After Disentanglement

UNDERSIDE of Animal (if able to safely and gently turn animal over)

PHOTOS of any gear entanglement (if applicable)

PHOTOS of entire ventral (bottom) side:

While Entangled , After Disentanglement

PHOTOS of any injuries or unique markings/scars (if applicable)

While Entangled , After Disentanglement

If the animal is DEAD, use a CAMERA to obtain the following:

TOP of Carcass

PHOTOS of any gear entanglement (if applicable)

(Continued on Back)

PHOTOS of entire dorsal side

PHOTOS of dorsal fin

PHOTOS of head/jaw

PHOTOS of flanks (sides)

PHOTOS of any injuries or unique markings/scars (if applicable)

(Continued on Back)

UNDERSIDE of Carcass (if safe and feasible to turn over carcass)

PHOTOS of any gear entanglement (if applicable)

PHOTOS of entire ventral (bottom) side

PHOTOS of any injuries or unique markings/scars (if applicable)

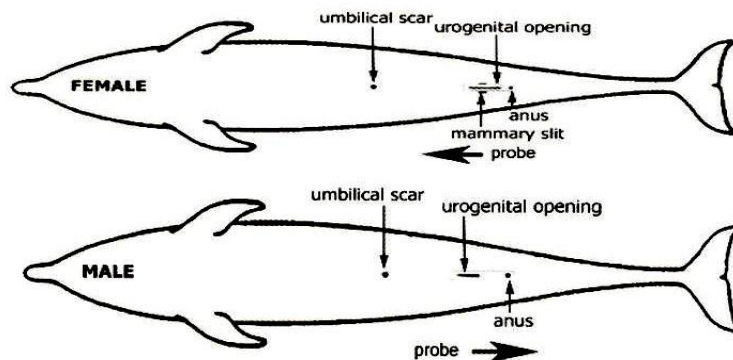
For Dead Cetaceans (Whales, Dolphins, and Porpoises)

Determine the sex of the animal, and use a MEASURING TAPE and SCALE to obtain the following for:

A. TL Length, snout to fluke notch (cm): _____

B. Girth at Axilla/circumference, right behind flippers (cm): _____

Sex (circle one): Male Female Unknown Unexamined



Dead Cetaceans:

Probe the urogenital opening: female = direction of the opening will be forward; males = direction of the opening will be toward the back (fluke).

- If you are examining the animal and are unsure of the sex in any way, please choose "unknown". However, if you are uncomfortable with trying to examine the animal in any way, simply choose "unexamined".

Weight (kg): _____

Continued on Page 3

For Pinnipeds (Seals)

Determine the sex of the animal, and use a MEASURING TAPE and SCALE to obtain the following for:

- A. Total Length, snout to tip of tail (cm):
- B. Girth at Axilla/circumference, right behind flippers (cm):

Sex (circle one): Male Female Unknown Unexamined

Examine the urogenital opening by stretching the rear flippers taut and very wide apart at the base of the tail, looking inside the outer openings.

- Females will have two, distinct, inner openings (anal and vaginal). The mammary teats (two) are posterior to the umbilical scar in females; finding the mammary teats can be difficult, however.
- Males will only have one opening at the base of the tail (anal). The penile opening is located along the ventral midline between the umbilical scar and the anus; finding the penile opening can be difficult, however.
- If you are examining the animal and are unsure of the sex in any way, please choose “unknown”. However, if you are uncomfortable with trying to examine the animal in any way, simply choose “unexamined”.

Weight (kg): _____

Condition During Release/Escape (check one):

- Alive uninjured Alive injured Fresh dead Decomposed Unresponsive

Species Death Condition (if applicable)

- Fresh dead Moderate decomposition Advanced decomposition
 Mummified or skeletal remains

(Continued on Back)

Turtle Data Collection Sheet

Station #: _____

Species (check one):

Green Hawksbill Kemp's Ridley Leatherback Loggerhead

Condition at Capture (check one):

Alive uninjured Alive injured Fresh dead Decomposed Unresponsive

If the animal is brought on board and determined to be dead, if feasible, the specimen should be retained on board until the vessel reaches port and collected by the local Regional Stranding Coordinator

Use a MEASURING TAPE and CAMERA to obtain the following:

TOP of Animal

- PHOTOS** of entire animal
- PHOTOS** of carapace
- PHOTOS** of head (both top and side views)
- PHOTOS** of all flippers

Curved carapace length, notch to notch (cm): _____

Straight carapace length (cm): _____

Curved carapace width (cm): _____

Straight carapace width (cm): _____

Head width (cm): _____

Tail length (cm): _____

UNDERSIDE of Animal (if able to safely and gently turn over turtle)

- PHOTOS** of plastron ("belly" shell)

Plastron length (cm): _____

Plastron width (cm): _____

Use a CAMERA to obtain the following, if applicable:

- PHOTOS** of any injuries
- PHOTOS** of unusual markings

PIT Tags

Scan for PIT tags, but DO NOT insert a new one.

PIT tag already present? (circle one): YES or NO

If YES

Tag #: _____

(Continued on back)

External Tags

Look for external tags, but DO NOT apply any new ones.

External tag/s already present? (circle one): YES or NO

If YES:

Where is/are external tag/s located?: _____

Tag #: _____

Use a SCALE to obtain the following:

Weight (kg): _____

Condition at Release (check one):

Alive uninjured Alive injured Fresh dead Decomposed Unresponsive

Species Death Condition (if applicable):

Fresh dead Moderate decomposition Advanced decomposition

Mummified or skeletal remains

Sturgeon Data Collection Sheet

*****IMPORTANT: Assign staff to GENTLY run saltwater over live sturgeon's gills while collecting data*****

Station # : _____

Species (check one): Atlantic sturgeon Shortnose sturgeon

Condition at Capture (check one):

Alive uninjured Alive injured Fresh dead Decomposed Unresponsive

Note: If sturgeon is dead and not badly decomposed, freeze animal for transport back to NMFS for necropsy AFTER collecting data on this form. If sturgeon is dead and badly decomposed, dispose of carcass at sea AFTER collecting as much data as possible on this form. In all dead sturgeon cases, the Dead Sturgeon Salvage Form (see electronic, at-sea resources folder) must also be completed by Chief Scientist within 30 days of investigation.

Use a MEASURING TAPE and a CAMERA to obtain the following:

Total length (cm): _____

Fork length (cm): _____

- PHOTOS** of entire side view, including measuring tape
- PHOTOS** of side scutes between caudal and anal fins
- PHOTOS** of dorsal fin to caudal fin

Use CALIPERS, a CAMERA, and a RULER to obtain the following:

Inside mouth width (mm): _____

- PHOTOS** of inside mouth width, including calipers

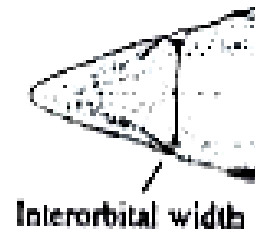
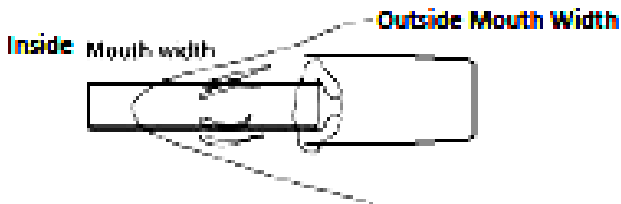
Outside (labial furrows) mouth width (mm): _____

- PHOTOS** of outside mouth width, including calipers

Head width of underside, inline with mouth (mm): _____

- PHOTOS** of ventral view of head, centered and including ruler across middle of mouth

Interorbital (between the eyes) head width (mm): _____



(Continued on Back)

PIT Tags

Scan the animal for PIT Tags. For live animals, if no tags present, insert new PIT tag just below skin along the dorsal mid-line anywhere from posterior edge of the 4th dorsal scute to the posterior edge of the dorsal fin.

PIT tag found? (circle one): YES or NO

If NO:

New PIT tag inserted? (circle one): YES or NO

PIT tag #: _____

If YES:

PIT tag #: _____

External Tags

Look for external tags. For live animals, if no tags present, insert new T-bar tag through base of dorsal fin.

External tag present? (circle one): YES or NO

If NO:

New external tag applied? (circle one): YES or NO

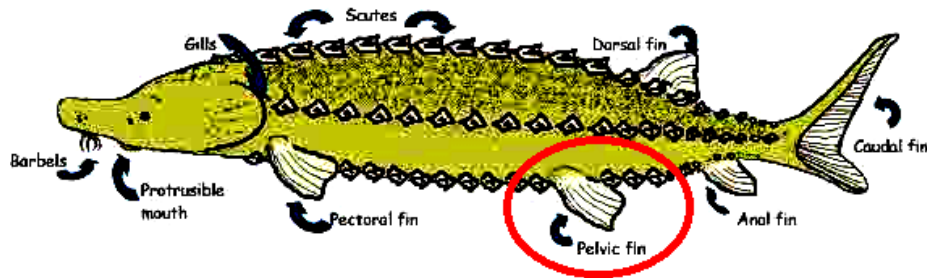
External tag #: _____

If YES:

External tag #: _____

Fin clips

- Wash hands and use disposable gloves
- Ensure knife, scalpel, or scissors have been cleaned and wiped with alcohol
- Take 1 cm² clip from the **PELVIC FIN**



- Place fin clip into vial of 95% non-denatured ethanol
- Using permanent marker, label with species name, date, station number, project name & fork length of animal
- Tape vial lid shut and place tape over labeled info (to minimize smearing)
- Store vial in fridge

Fin clip taken? (circle one): YES or NO

If YES:

Vial #: _____

Use a SCALE to obtain the following:

Total Weight (kg): _____

Condition at Release (check one):

- Alive uninjured Alive injured Fresh dead Decomposed Unresponsive