



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

November 15, 2016

MEMORANDUM FOR: Captain Donn Pratt, NOAA
Master, NOAA Ship *Nancy Foster*

FROM: Captain Scott M. Sirois, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for NF-16-10
Miami ODMDS SPI/PCB Survey

Attached is the final Project Instruction for NF-16-10 Miami ODMDS SPI/PCB Survey, which is scheduled aboard NOAA Ship *Nancy Foster* during the period of November 29 to December 9, 2016. Of the 11 DAS scheduled for this project, 11 days are Other Agency funded. This project is estimated to exhibit a High Operational Tempo. Acknowledge receipt of these instructions via e-mail to OpsMgr.MOA@noaa.gov at Marine Operations Center-Atlantic.

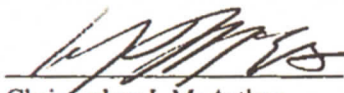


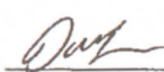


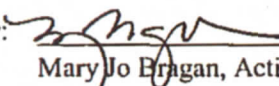
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

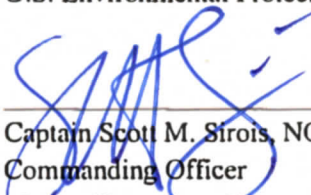
FINAL Project Instructions

Date Submitted: November 14, 2016
Platform: NOAA Ship *Nancy Foster*
Project Number: NF-16-10 (OMAO), 17-0012 (EPA/SESD)
Project Title: Miami ODMDS SPI/PCB Survey
Project Dates: November 29, 2016 to December 09, 2016.

Prepared by:  Dated: 11/14/16
Christopher J. McArthur
Chief Scientist
Water Protection Division
U.S. Environmental Protection Agency Region 4

Approved by:  Dated: 11/15/16
Wade Lehmann
Miami ODMDS Site Manager
Oceans, Wetlands and Streams Protection Branch
Water Protection Division
U.S. Environmental Protection Agency Region 4

Approved by:  Dated: 11/14/16
Mary Jo Bragan, Acting Chief
Oceans, Wetlands and Streams Protection Branch
Water Protection Division
U.S. Environmental Protection Agency Region 4

Approved by:  Dated: 11/16/16
Captain Scott M. Sirois, NOAA
Commanding Officer
Marine Operations Center - Atlantic

I. Overview

A. Brief Summary and Project Period

Under the Marine Protection, Research, and Sanctuaries Act (MPRSA), it is the U.S. Environmental Protection Agency's mission to manage Ocean Dredged Material Disposal Sites (ODMDSs) to ensure that the ocean disposal of dredged material does not adversely impact human health or the marine environment. There are two objectives to this survey: 1) map the disposal mound and apron of the 2013-15 disposal event to determine the effectiveness of the new release zone on keeping disposed material within the ODMDS boundaries; 2) determine if the disposal of 5 million cubic yards of new work material remediated the elevated copper and PCB sediment concentrations.

B. Days at Sea (DAS)

Of the 11 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 0 DAS are funded by a Line Office Allocation, 0 DAS are Program Funded, and 11 DAS are Other Agency funded. This project is estimated to exhibit a High Operational Tempo.

C. Operating Area (include optional map/figure showing op area)

The cruise will entail a transit from Charleston to Canaveral for mobilization and then from Canaveral to Miami for operations (figure 1). The operating area includes the areas offshore Miami and Fort Lauderdale, Florida (see figure 2).

D. Summary of Objectives

There are two objectives to this survey:

- 1) Map the disposal mound and apron of the 2013-15 disposal event to determine the effectiveness of the new release zone on keeping disposed material within the ODMDS boundaries. Mapping will utilize a Sediment Profile Imaging (SPI) camera as well as a Planview (PV) camera. The PV camera will also be utilized to document the creation of any hard-bottom essential fish habitat as a result of disposal activities. Approximately 75 primary SPI and PV stations will be photographed. Additional stations may be added based on preliminary analysis of the images.
- 2) Determine if the disposal of 5 million cubic yards of new work material remediated the elevated copper and PCB sediment concentrations. Approximately 60 sediment samples will be collected throughout and surrounding the ODMDS for laboratory physical and chemical analysis.

Additionally, as time permits, multibeam sonar and fishery acoustic surveys will be conducted of the Miami ODMDS. Additionally, benthic samples will be collected at 16 stations and one CTD cast will be conducted and water samples collected at three depths.

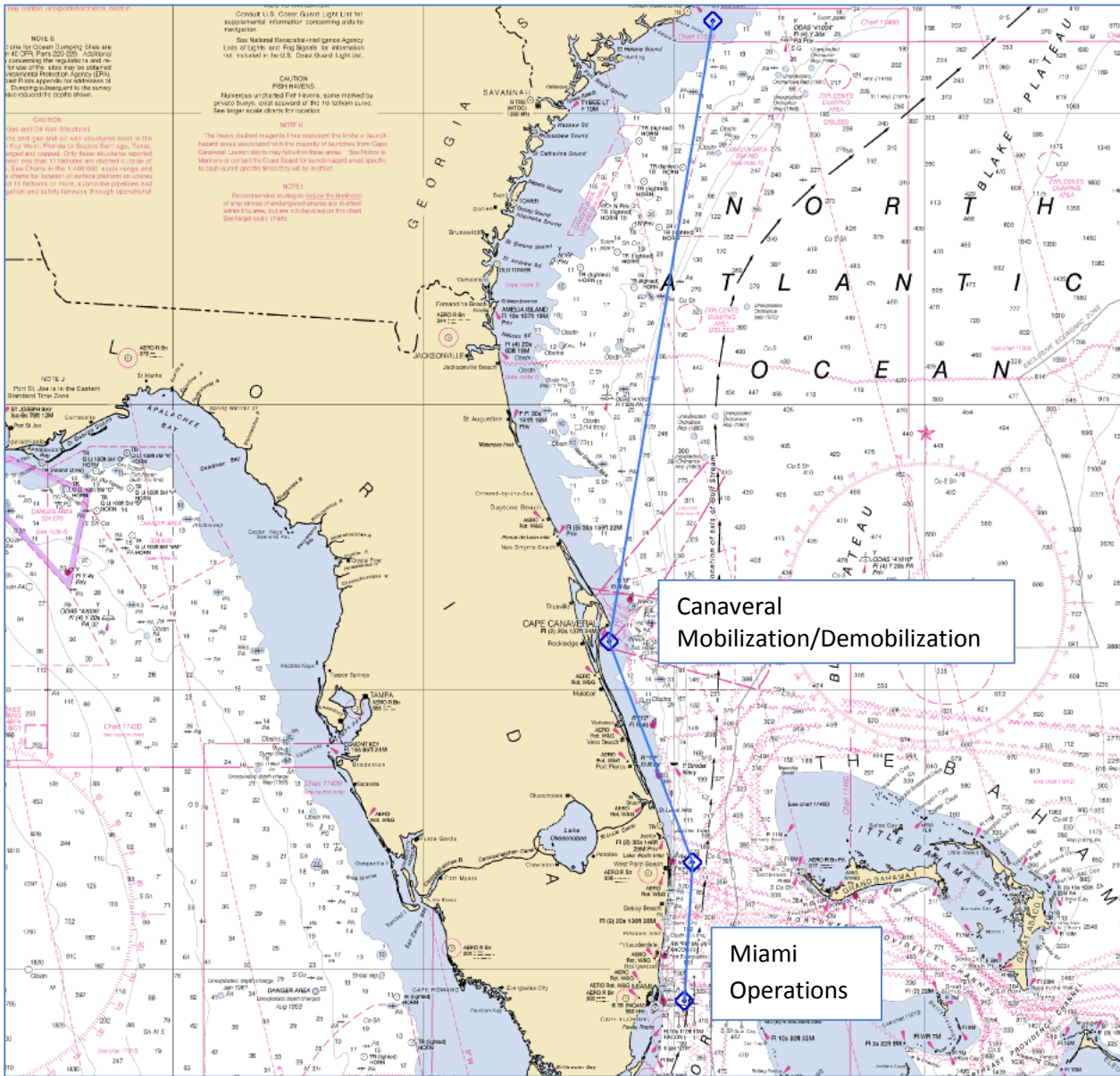


Figure 1: Transits

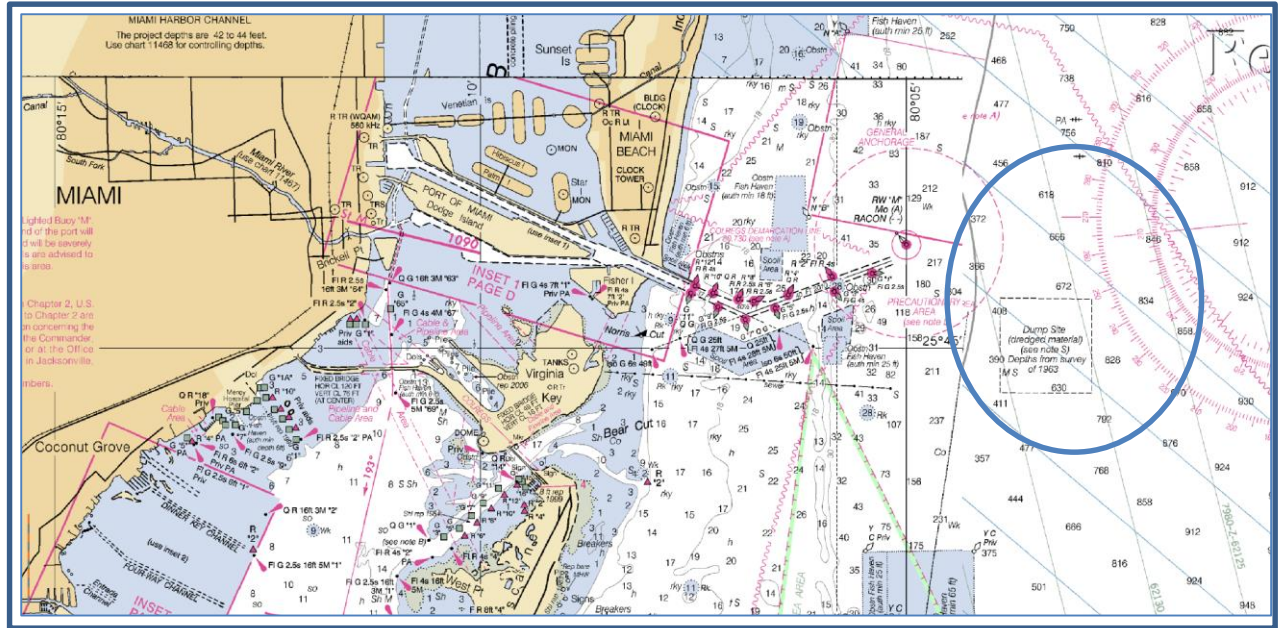


Figure 2: Project Area

E. Participating Institutions

U.S. Environmental Protection Agency; Battelle Memorial Institute

F. Personnel/Science Party: name, title, gender, affiliation, and nationality

| Name (Last, First) | Title | Date Aboard | Date Disembark | Gender | Affiliation | Nationality |
|------------------------|-------------------------|-------------|----------------|--------|-------------|-------------|
| Harper, Cecilia | Environmental Scientist | 12/01/16 | 12/08/16 | Female | EPA | USA |
| King, Mason | Environmental Scientist | 12/01/16 | 12/08/16 | Male | ORISE | USA |
| Lehmann, Daniel (Wade) | Toxicologist | 12/01/16 | 12/08/16 | Male | EPA | USA |
| Mansfield, Alex | Scientist | 12/01/16 | 12/08/16 | Male | Battelle | USA |
| McArthur, Christopher | Chief Scientist | 12/01/16 | 12/08/16 | Male | EPA | USA |
| Mills, Calista | Environmental Scientist | 12/01/16 | 12/08/16 | Female | EPA | USA |
| Parsons, Mel | Environmental Scientist | 12/01/16 | 12/08/16 | Male | EPA | USA |
| Platukye, Simona | Environmental Scientist | 12/01/16 | 12/08/16 | Female | EPA | USA |
| Ruiz, John | Physical Scientist | 12/01/16 | 12/08/16 | Male | EPA | USA |

| | | | | | | |
|-----------------|-------------------------|----------|----------|--------|-----|-----|
| Steve Blackburn | Environmental Scientist | 12/01/16 | 12/08/16 | Male | EPA | USA |
| Weiss, Lena | Environmental Scientist | 12/01/16 | 12/08/16 | Female | EPA | USA |

G. Administrative

1. Points of Contacts:

Chief Scientist: Christopher McArthur, U.S. EPA Region 4, 61 Forsyth Street, SW. Atlanta, GA 30303, 404-562-9391, mcarthur.christopher@epa.gov

Sediment Sampling Lead (candidate Chief Scientist): John Ruiz, U.S. EPA Region 4, 980 College Station Road, Athens, GA 30605, 706-355-8725, ruiz.john@epa.gov

Nancy Foster Operations Officer, LT Linh Nguyen, 1050 Register St., North Charleston, SC 29405, 843-991-6326, ops.nancy.foster@noaa.gov

2. Diplomatic Clearances

None Required.

3. Licenses and Permits

None Required.

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:

TRANSIT 1

29-30 November: NOAA Ship Nancy Foster transit from Charleston, SC to Canaveral, FL. Depart Charleston approximately 1000 on November 29. Arrive Canaveral approximately 1800 on November 30.

MOBILIZATION

30 November: 1800 Canaveral, FL. Science party boards

1 December: 0800-1400 Canaveral FL. Load and prepare equipment. Crane requested for loading SPI camera and sediment sampling grabs.

TRANSIT 2

1-2 December: 1400 Ship departs Canaveral. Continue preparing equipment. Required briefings and safety drills.

OPERATIONS

2-5 December: 1000 Ship arrives on station, Miami, FL. SPI, sediment sampling, and seafloor mapping.

6 December: Benthic grabs. Complete by 1600

TRANSIT 3

6-7 December: 1600 Ship departs survey operations offshore Miami, FL. Arrives at Canaveral by 1200 on December 7.

DEMOBILIZATION

7 December: 1200 Offload equipment. Crane requested for offloading SPI camera and sampling grabs.

8 December: 0800 Offload sediment samples.

TRANSIT 4

8-9 December: 0900 Ship departs Canaveral, FL for Charleston, SC. Ship arrives Charleston, SC 1700 hours on December 9.

B. Staging and Destaging:

Science crew will meet Nancy Foster after 1800 hour on 30 November in Canaveral, FL (USCG Base). Equipment will be loaded on 01 December in Canaveral, FL. De-staging will also occur in Canaveral, FL from 07 to 08 of December. Note that a back-up SPI system (described below) will

be shipped to Nancy Foster in Charleston for loading prior to departure. This system will be stored in crates until (if) needed.

C. Operations to be Conducted:

Sediment Profile Imaging (SPI)

SPI and PV image acquisition will occur simultaneously during 24 hour operations. Primary stations will be completed first. After initial review of data, secondary stations will be completed as necessary. Operations will require a ship's survey technician and a winch operator. It will also require a NMEA navigation (position and heading) feed into the wet lab. The SPI camera consists of a wedge-shaped prism with a Plexiglas faceplate; light is provided by an internal strobe all mounted in a large frame (Figure 3). The camera frame measures 68" x 26" x 36" and the base is approximately 5' x 5'. The whole system weighs approximately 1,000 lbs. A back-up system (same weight) will be loaded in Charleston and stored in crates on board and utilized if needed.

To collect SPI data, the survey vessel will be piloted to each target sampling location. Once within a pre-determined distance of the target location, the SPI camera will be deployed. For the present survey, 25 m will be established as the initial goal, but the EPA Chief Scientist in consultation with the Commanding Officer will have the flexibility to change this as necessary or desirable depending on the conditions actually encountered in the field.

For deployment of the SPI camera system, it is first attached to *Nancy Foster's* hydrowire through the block on the J-frame. The camera prism is mounted on an assembly that can be moved up and down by producing tension or slack on the winch wire. As the camera is lowered through the water, tension on the wire keeps the prism in the "up" position. Once the camera frame contacts the bottom, slack on the wire allows the prism to vertically descend into the seafloor.

The rate at which the optical prism penetrates into the sediments is controlled by a passive hydraulic piston. This allows the optical prism to descend at approximately 6 cm per second and minimizes disturbance to the sediment column. As the SPI prism penetrates into the seafloor, a magnetic switch is triggered, and a photograph of the sediment column is taken 15 seconds from the time of switch contact. This time delay allows for optimal penetration of the prism into the sediment.

As the camera is raised off the bottom, a wiper blade automatically cleans any sediment off of the prism faceplate. The digital camera is automatically ready to take another photograph, the strobes are recharged, and the camera can be lowered for another replicate image. Three replicates will be taken at each station. The instrument will be raised slightly off the bottom between replicates and will be retrieved and brought on deck between stations. At least three replicates will be taken at each station to insure a minimum of three quality replicate images at each station.

When the camera is brought to the surface, the frame count is verified and the camera prism penetration is estimated from a penetration indicator that measures the distance the prism fell relative to the camera base. If penetration is minimal, weight packs can be loaded to give the assembly increased penetration. If penetration is too great, adjustable stops (which control the distance the prism descends) can be lowered, and "mud" doors can be attached to each side of the frame to increase the bearing surface. Images have to be manually downloaded from the camera, which should take approximately 15 minutes. Initially, this will be done after every station in order to verify that everything is working correctly. Thereafter, downloads will occur approximately every two hours of operation.

Initial SPI stations are provided in Appendix A. Additional SPI stations may be added based on preliminary review of the images and sampled following sediment sampling.

Sediment Sampling

Sediment sampling will be conducted utilizing either a 0.1 m² Young Grab or a large Deep Ocean Van Veen during 24 hour operations. The Van Veen will only be used if current conditions prevent the Young Grab from obtaining quality samples. Due to the large size of the Van Veen, it will likely require the aft A-frame for deployment. The grab will be lowered to the seafloor and retrieved. A single grab meeting QA/QC requirements will be obtained from each station. A subsample from each grab sample will be obtained, mixed and subsampled for physical and chemical analysis. Samples will be stored in the refrigerator in the wet lab. Sediment sampling stations are provided in Appendix B.

Water Sampling

Water samples and a CTD cast will be conducted at station M11 on the last day. Water samples will be collected at three depths plus a duplicate. Approximately 3 liters of water will be collected at each depth and for the duplicate.

Benthic Macroinvertebrate Sampling

Macroinvertebrate samples will be collected at stations M01-M16 following completion of the sediment sampling. Samples will be sieved on board and preserved in NotoxHisto.

Seafloor Mapping: Multibeam sonar and fishery acoustic survey

Seafloor mapping of the Miami ODMDS will be conducted during night operations, time permitting. Survey locations will be refined by the Chief Scientist in consultation with the Ship's Survey Department based on available time. Mapping will use the ship's multibeam (Reson 7125 or Kongsberg EM710) to log bathymetry and backscatter and will be operated by the survey department with assistance from science party. Survey lines will be developed to ensure greater than 110% bottom coverage and any required cross lines.

D. Dive Plan

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program (<http://www.ndc.noaa.gov/dr.html>) and require the approval of the ship's Commanding Officer. (This statement must remain in all project instructions)

Dives are not planned for this project.

E. Applicable Restrictions

Conditions which preclude normal operations:

- High sea state presenting danger to crew and equipment during deployment/retrieval. Mitigation includes suspending operations until sea state subsides. Precision of drops could be reduced if it increases maneuverability of the ship in the seas.
- Strong currents could prevent obtaining quality sediment samples from the 0.1m² Young Grab. Additional weight or the large Deep Ocean Van Veen could be utilized instead.
- The SPI and/or Plan View camera could be damaged during deployment/recovery or could malfunction. A backup system will be available.

III. Equipment

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

| Equipment | Activity |
|---|---|
| Main Deck Crane | Loading/Unloading Equipment |
| Dynamic Position System | Ships Positioning on station |
| Port J-Frame | Sediment Grabs/SPI Camera/Neuston Net |
| Aft A-Frame | Sediment Grabs (large Deep Ocean Van Veen) if needed |
| Winch and Hydrowire | Sediment Grabs/SPI Camera/ Neuston Net |
| Kongsberg EM710 and Reson Seabat 7125 multibeam sonars, and Simrad split-beam EK-60 sonars. | Seafloor Mapping |
| Refrigerator Space | Sediment Sample Storage |
| NMEA RS232 GPS feed (position and heading) and remote nav monitor in the wet lab | Position logging |
| Seabird CTD/Rossette | Water Sampling/Profiling |
| Salt water on deck | Equipment wash-down between stations |
| Fresh water on deck | Equipment wash-down following operations |
| Ice Machine | Make Ice for Sample Preservation |

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

| Equipment | Activity |
|---|---------------------------|
| HYPACK data acquisition and navigation software | Sampling Location Logging |
| 0.1m ² Young Grab | Sediment Sampling |
| Deep Ocean Van Veen | Backup Sediment Sampling |
| Sample Containers | Sediment Sampling |
| SPI/PV Camera (2) | SPI Operations |
| Manta Neuston Net | Microplastics sampling |

The Deep Ocean Van Veen weighs approximately 800 lbs and should be stored on the back deck for possible use from the aft A-frame.



Figure 3: Deep Ocean Van Veen

An assembled SPI/PV system will be loaded in Canaveral. This system weighs approximately 1,000 lbs. A back-up SPI/PV system will be shipped to the Nancy Foster in Charleston:

- One pallet is (48"x40"x25"), ~200 lbs
- Second pallet is (48"x40"x25"), ~310 lbs
- Third pallet containing lead weights - 42x32x19; approximately 275 lbs
- Fourth pallet with SPI frame - 46x36x63; approximately 300 lbs

- Long wooden crate with frame “footprint”, protective cage, misc hardware - 72x12x24; approximately 400 lbs

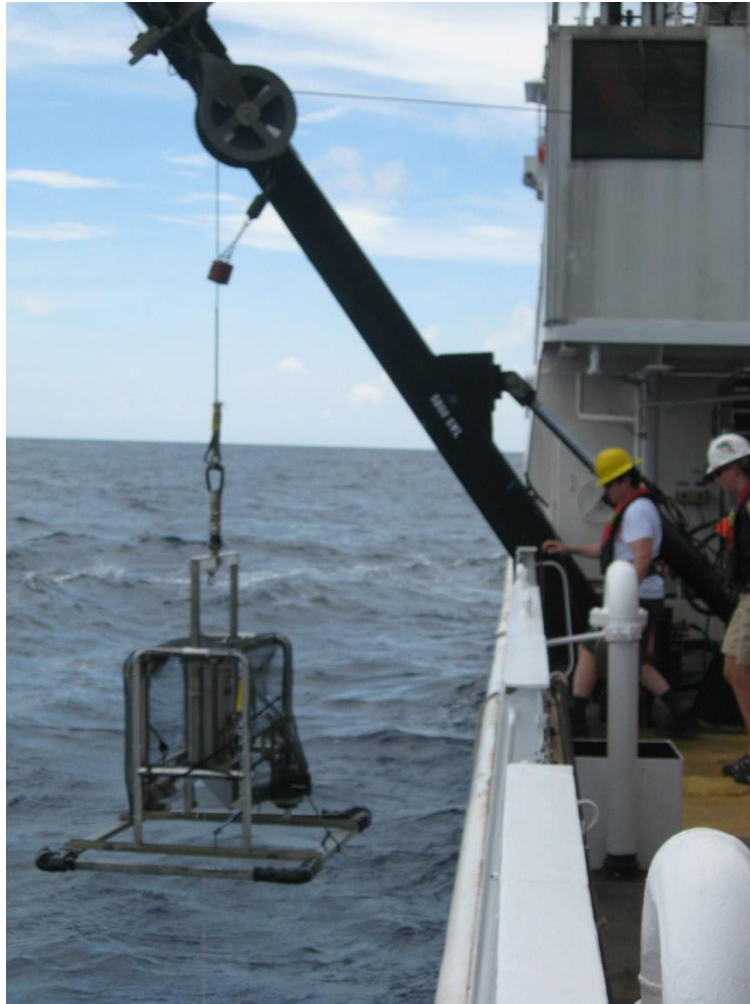


Figure 4: SPI/PV System

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 the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, or absorbents in amounts adequate to address spills of a size equal to the amount of

chemical brought aboard, and a chemical hygiene plan. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per FEC 07, the scientific party will include with their project instructions and provide to the CO of the respective ship 60 to 90 days before departure:

- A list of hazardous materials by name and anticipated quantity
- Include a chemical spill plan that addresses all of the chemicals the program is bringing aboard. This shall include:
 - Procedures on how the spilled chemicals will be contained and cleaned up.
 - A complete inventory (including volumes/amounts) of the chemical spill supplies and equipment brought aboard by the program. This must be sufficient to clean and neutralize all of the chemicals brought aboard by the program.
 - A list of the trained personnel that will be accompanying the project and the training they've completed.

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 of hazardous material indicating all materials have been used or 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 scientific chemicals is not permitted during projects aboard NOAA ships.

B. Inventory

| Chemical | Quantity | Use |
|--------------------------|----------------------|--|
| NOTOXHisto | 2 x 5 gallons | Macroinvertebrate tissue preservative |
| Nitric acid – 20% | 36 x 5 ml | Water sample metals preservative |

C. Chemical safety and spill response procedures

20% nitric acid used for preservative during the survey is dispensed in individual 5ml vials, therefore, it is anticipated that any spill that might occur would be small. Preservation will occur in the wet lab with absorbent mats beneath samples in case there are spills. Should an acid spill occur, the absorbent mat would be stored in a disposal bucket and taken back to the EPA laboratory for disposal. The area beneath the mat would be rinsed and cleaned with fresh water.

NOTOXHisto is a non-toxic tissue preservative. It is stored in cardboard reinforced plastic cube-containers. The preservative will be transferred to buckets containing sample for preservation outside on the quarterdeck area. Absorbent mats will be used under and around containers during transfer. Should a NOTOXHisto spill occur, absorbent mats would be used to thoroughly clean and dry the area surrounding the spill. Absorbent mats would then be stored in a disposal bucket and taken back to the EPA laboratory for disposal.

Material Safety Data Sheets (MSDS) are attached in Appendix C at the end of this document.

V. Additional Projects

A. Supplementary (“Piggyback”) Projects

Seafloor mapping if time permits.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

All samples and data collected are the responsibility of the Chief Scientist. An operational survey report will be developed and provided to EPA HQ within 21 days of survey completion. A Site Monitoring and Assessment Report will be written and provided to EPA HQ by 7/1/17. Seafloor mapping data will be collected and archived by NOAA personnel in accordance with NOAA policies. Copies of the data will be provided to EPA at the conclusion of the survey.

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 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. Ship Familiarization Meeting: The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and ship protocols, e.g., meals, watches, etiquette, drills, etc. A ship 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 hrs before or 7 days after the completion of the project to discuss the overall success and/or 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 <https://sites.google.com/a/noaa.gov/omao-intranet-dev/operations/marine/customer-satisfaction-survey> and provides a "Submit" button at the end of the form. It is also located at https://docs.google.com/a/noaa.gov/forms/d/1a5hCCkgIwaSII4DmrHPudAehQ9HqhRqY3J_FXqbJp9g/viewform. 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 provided 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 and clearances. 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 ships 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 ship 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 ships.

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.omaο.noaa.gov/learn/marine-operations/about/project-planning/health-screening>.

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 Executive 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. Flotation vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and flotation 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 and crocs) outside of 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 placed on 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 are 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

Foreign National access to the NOAA ship or Federal Facilities is not required for this project.

VIII. Appendices

- A. Figures, maps, tables, images, etc.
- B. Station/Waypoint List (coordinates in Latitude, Longitude: degree-minutes)
- C. MSDS

Appendix A: Station/Waypoint Maps

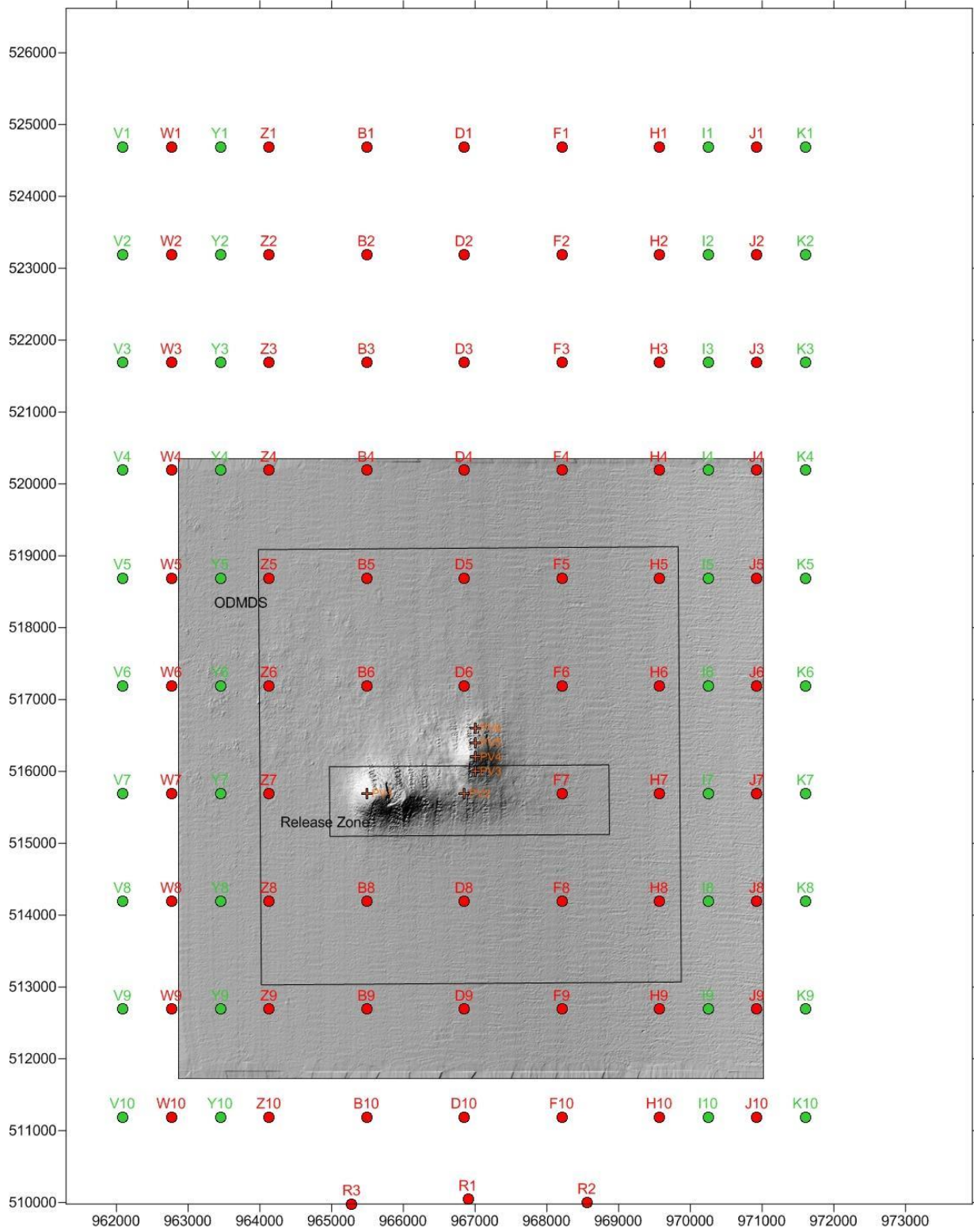


Figure 5: SPI/PV Stations (red are primary; green are secondary)

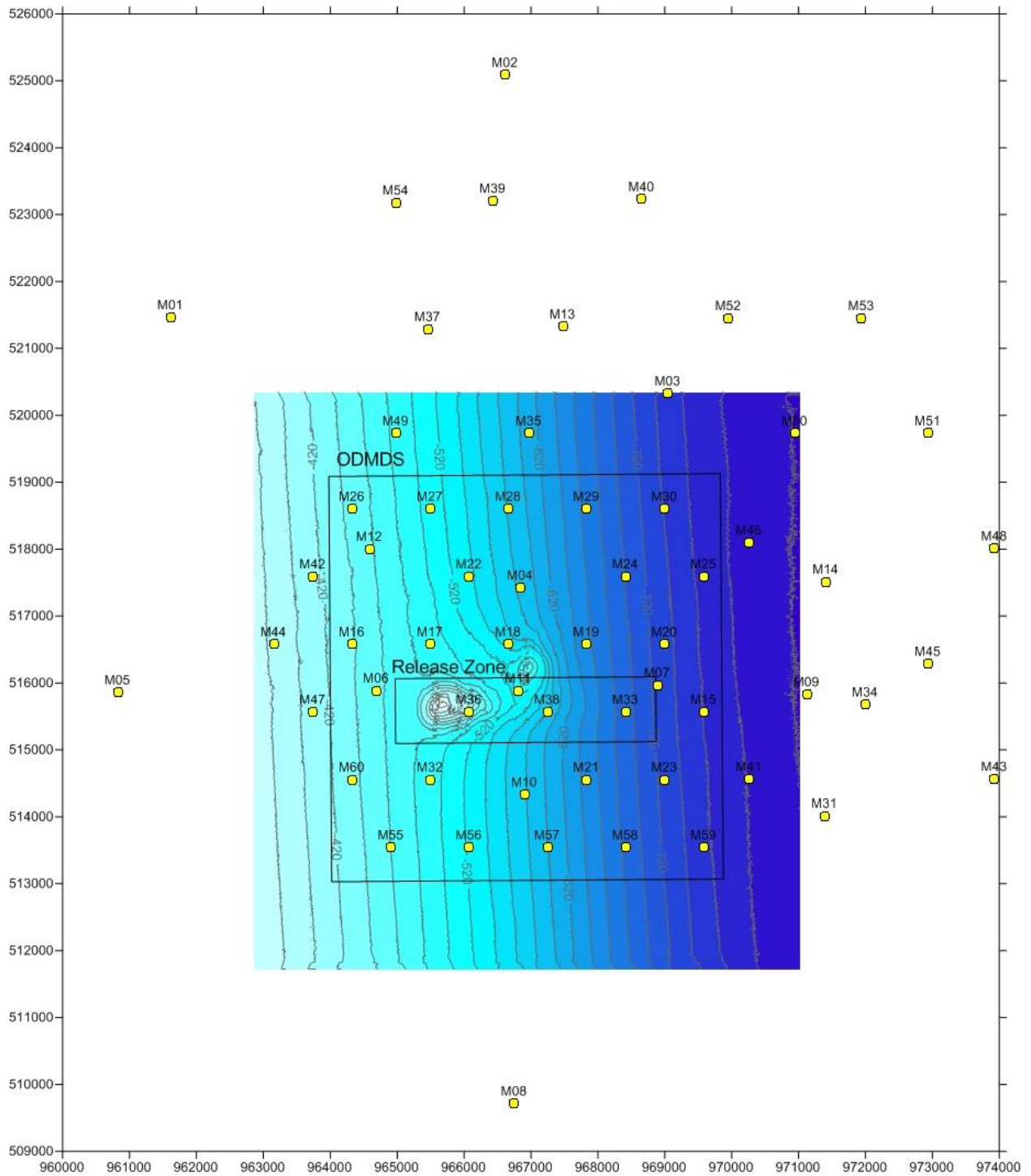


Figure 6: Sediment sampling stations

Appendix B: Station/Waypoint List

Table 1: SPI Primary Stations

| <i>Station</i> | <i>Latitude</i> | <i>Longitude</i> | <i>X</i> | <i>Y</i> |
|----------------|-----------------|------------------|----------|----------|
| W1 | 25 46.4491011 | 80 04.0990873 | 962769 | 524690 |
| W2 | 25 46.2015031 | 80 04.1010207 | 962769 | 523190 |
| W3 | 25 45.9539050 | 80 04.1029538 | 962769 | 521690 |
| W4 | 25 45.7063067 | 80 04.1048864 | 962769 | 520190 |
| W5 | 25 45.4587082 | 80 04.1068186 | 962769 | 518690 |
| W6 | 25 45.2111096 | 80 04.1087504 | 962769 | 517190 |
| W7 | 25 44.9635109 | 80 04.1106818 | 962769 | 515690 |
| W8 | 25 44.7159120 | 80 04.1126128 | 962769 | 514190 |
| W9 | 25 44.4683130 | 80 04.1145433 | 962769 | 512690 |
| W10 | 25 44.2207138 | 80 04.1164734 | 962769 | 511190 |
| Z1 | 25 46.4475102 | 80 03.8511531 | 964129 | 524690 |
| Z2 | 25 46.1999125 | 80 03.8530952 | 964129 | 523190 |
| Z3 | 25 45.9523146 | 80 03.8550368 | 964129 | 521690 |
| Z4 | 25 45.7047166 | 80 03.8569780 | 964129 | 520190 |
| Z5 | 25 45.4571184 | 80 03.8589188 | 964129 | 518690 |
| Z6 | 25 45.2095201 | 80 03.8608591 | 964129 | 517190 |
| Z7 | 25 44.9619217 | 80 03.8627991 | 964129 | 515690 |
| Z8 | 25 44.7143231 | 80 03.8647386 | 964129 | 514190 |
| Z9 | 25 44.4667244 | 80 03.8666777 | 964129 | 512690 |
| Z10 | 25 44.2191255 | 80 03.8686163 | 964129 | 511190 |
| B1 | 25 46.4459122 | 80 03.6032193 | 965489 | 524690 |
| B2 | 25 46.1983148 | 80 03.6051699 | 965489 | 523190 |
| B3 | 25 45.9507172 | 80 03.6071201 | 965489 | 521690 |
| B4 | 25 45.7031195 | 80 03.6090699 | 965489 | 520190 |
| B5 | 25 45.4555216 | 80 03.6110192 | 965489 | 518690 |

| | | | | |
|------------|----------------------|----------------------|---------------|---------------|
| <i>B6</i> | <i>25 45.2079236</i> | <i>80 03.6129682</i> | <i>965489</i> | <i>517190</i> |
| <i>B8</i> | <i>25 44.7127272</i> | <i>80 03.6168647</i> | <i>965489</i> | <i>514190</i> |
| <i>B9</i> | <i>25 44.4651287</i> | <i>80 03.6188124</i> | <i>965489</i> | <i>512690</i> |
| <i>B10</i> | <i>25 44.2175302</i> | <i>80 03.6207596</i> | <i>965489</i> | <i>511190</i> |
| <i>D1</i> | <i>25 46.4443072</i> | <i>80 03.3552858</i> | <i>966849</i> | <i>524690</i> |
| <i>D2</i> | <i>25 46.1967101</i> | <i>80 03.3572450</i> | <i>966849</i> | <i>523190</i> |
| <i>D3</i> | <i>25 45.9491128</i> | <i>80 03.3592038</i> | <i>966849</i> | <i>521690</i> |
| <i>D4</i> | <i>25 45.7015153</i> | <i>80 03.3611621</i> | <i>966849</i> | <i>520190</i> |
| <i>D5</i> | <i>25 45.4539178</i> | <i>80 03.3631201</i> | <i>966849</i> | <i>518690</i> |
| <i>D6</i> | <i>25 45.2063201</i> | <i>80 03.3650775</i> | <i>966849</i> | <i>517190</i> |
| <i>D8</i> | <i>25 44.7111242</i> | <i>80 03.3689912</i> | <i>966849</i> | <i>514190</i> |
| <i>D9</i> | <i>25 44.4635261</i> | <i>80 03.3709474</i> | <i>966849</i> | <i>512690</i> |
| <i>D10</i> | <i>25 44.2159278</i> | <i>80 03.3729032</i> | <i>966849</i> | <i>511190</i> |
| <i>F1</i> | <i>25 46.4426951</i> | <i>80 03.1073527</i> | <i>968209</i> | <i>524690</i> |
| <i>F2</i> | <i>25 46.1950983</i> | <i>80 03.1093205</i> | <i>968209</i> | <i>523190</i> |
| <i>F3</i> | <i>25 45.9475013</i> | <i>80 03.1112878</i> | <i>968209</i> | <i>521690</i> |
| <i>F4</i> | <i>25 45.6999042</i> | <i>80 03.1132547</i> | <i>968209</i> | <i>520190</i> |
| <i>F5</i> | <i>25 45.4523069</i> | <i>80 03.1152212</i> | <i>968209</i> | <i>518690</i> |
| <i>F6</i> | <i>25 45.2047095</i> | <i>80 03.1171873</i> | <i>968209</i> | <i>517190</i> |
| <i>F7</i> | <i>25 44.9571119</i> | <i>80 03.1191529</i> | <i>968209</i> | <i>515690</i> |
| <i>F8</i> | <i>25 44.7095142</i> | <i>80 03.1211181</i> | <i>968209</i> | <i>514190</i> |
| <i>F9</i> | <i>25 44.4619164</i> | <i>80 03.1230829</i> | <i>968209</i> | <i>512690</i> |
| <i>F10</i> | <i>25 44.2143184</i> | <i>80 03.1250472</i> | <i>968209</i> | <i>511190</i> |
| <i>H1</i> | <i>25 46.4410760</i> | <i>80 02.8594200</i> | <i>969569</i> | <i>524690</i> |
| <i>H2</i> | <i>25 46.1934795</i> | <i>80 02.8613963</i> | <i>969569</i> | <i>523190</i> |
| <i>H3</i> | <i>25 45.9458828</i> | <i>80 02.8633722</i> | <i>969569</i> | <i>521690</i> |
| <i>H4</i> | <i>25 45.6982860</i> | <i>80 02.8653477</i> | <i>969569</i> | <i>520190</i> |
| <i>H5</i> | <i>25 45.4506890</i> | <i>80 02.8673228</i> | <i>969569</i> | <i>518690</i> |
| <i>H6</i> | <i>25 45.2030919</i> | <i>80 02.8692974</i> | <i>969569</i> | <i>517190</i> |

| | | | | |
|------------|----------------------|----------------------|-----------------|-----------------|
| <i>H7</i> | <i>25 44.9554946</i> | <i>80 02.8712716</i> | <i>969569</i> | <i>515690</i> |
| <i>H8</i> | <i>25 44.7078972</i> | <i>80 02.8732453</i> | <i>969569</i> | <i>514190</i> |
| <i>H9</i> | <i>25 44.4602996</i> | <i>80 02.8752186</i> | <i>969569</i> | <i>512690</i> |
| <i>H10</i> | <i>25 44.2127020</i> | <i>80 02.8771915</i> | <i>969569</i> | <i>511190</i> |
| <i>J1</i> | <i>25 46.4394499</i> | <i>80 02.6114876</i> | <i>970929</i> | <i>524690</i> |
| <i>J2</i> | <i>25 46.1918537</i> | <i>80 02.6134725</i> | <i>970929</i> | <i>523190</i> |
| <i>J3</i> | <i>25 45.9442573</i> | <i>80 02.6154570</i> | <i>970929</i> | <i>521690</i> |
| <i>J4</i> | <i>25 45.6966607</i> | <i>80 02.6174410</i> | <i>970929</i> | <i>520190</i> |
| <i>J5</i> | <i>25 45.4490640</i> | <i>80 02.6194246</i> | <i>970929</i> | <i>518690</i> |
| <i>J6</i> | <i>25 45.2014672</i> | <i>80 02.6214078</i> | <i>970929</i> | <i>517190</i> |
| <i>J7</i> | <i>25 44.9538703</i> | <i>80 02.6233906</i> | <i>970929</i> | <i>515690</i> |
| <i>J8</i> | <i>25 44.7062731</i> | <i>80 02.6253729</i> | <i>970929</i> | <i>514190</i> |
| <i>J9</i> | <i>25 44.4586759</i> | <i>80 02.6273548</i> | <i>970929</i> | <i>512690</i> |
| <i>J10</i> | <i>25 44.2110785</i> | <i>80 02.6293362</i> | <i>970929</i> | <i>511190</i> |
| <i>R1</i> | <i>25 44.0271000</i> | <i>80 03.3646002</i> | <i>966902.7</i> | <i>510046.4</i> |
| <i>R2</i> | <i>25 44.0176998</i> | <i>80 03.0625002</i> | <i>968560.7</i> | <i>510001.4</i> |
| <i>R3</i> | <i>25 44.0179002</i> | <i>80 03.6601998</i> | <i>965281.2</i> | <i>509979.1</i> |

Table 2: Planview Only Stations

| <i>Station</i> | <i>Latitude</i> | <i>Longitude</i> | <i>X</i> | <i>Y</i> |
|----------------|----------------------|----------------------|---------------|---------------|
| <i>PV1</i> | <i>25 44.9603255</i> | <i>80 03.6149167</i> | <i>965489</i> | <i>515690</i> |
| <i>PV2</i> | <i>25 44.9587222</i> | <i>80 03.3670346</i> | <i>966849</i> | <i>515690</i> |
| <i>PV3</i> | <i>25 45.0097140</i> | <i>80 03.3391078</i> | <i>967000</i> | <i>516000</i> |
| <i>PV4</i> | <i>25 45.0427270</i> | <i>80 03.3388468</i> | <i>967000</i> | <i>516200</i> |
| <i>PV5</i> | <i>25 45.0757401</i> | <i>80 03.3385857</i> | <i>967000</i> | <i>516400</i> |
| <i>PV6</i> | <i>25 45.1087531</i> | <i>80 03.3383246</i> | <i>967000</i> | <i>516600</i> |

Table 3:SPI Secondary Stations

| <i>Station</i> | <i>Latitude</i> | <i>Longitude</i> | <i>X</i> | <i>Y</i> |
|----------------|----------------------|----------------------|---------------|---------------|
| <i>Y1</i> | <i>25 46.4483065</i> | <i>80 03.9751201</i> | <i>963449</i> | <i>524690</i> |
| <i>Y2</i> | <i>25 46.2007087</i> | <i>80 03.9770579</i> | <i>963449</i> | <i>523190</i> |
| <i>Y3</i> | <i>25 45.9531107</i> | <i>80 03.9789952</i> | <i>963449</i> | <i>521690</i> |
| <i>Y4</i> | <i>25 45.7055125</i> | <i>80 03.9809322</i> | <i>963449</i> | <i>520190</i> |
| <i>Y5</i> | <i>25 45.4579142</i> | <i>80 03.9828687</i> | <i>963449</i> | <i>518690</i> |
| <i>Y6</i> | <i>25 45.2103158</i> | <i>80 03.9848047</i> | <i>963449</i> | <i>517190</i> |
| <i>Y7</i> | <i>25 44.9627172</i> | <i>80 03.9867404</i> | <i>963449</i> | <i>515690</i> |
| <i>Y8</i> | <i>25 44.7151184</i> | <i>80 03.9886756</i> | <i>963449</i> | <i>514190</i> |
| <i>Y9</i> | <i>25 44.4675196</i> | <i>80 03.9906104</i> | <i>963449</i> | <i>512690</i> |
| <i>Y10</i> | <i>25 44.2199205</i> | <i>80 03.9925448</i> | <i>963449</i> | <i>511190</i> |
| <i>I1</i> | <i>25 46.4402639</i> | <i>80 02.7354537</i> | <i>970249</i> | <i>524690</i> |
| <i>I2</i> | <i>25 46.1926675</i> | <i>80 02.7374344</i> | <i>970249</i> | <i>523190</i> |
| <i>I3</i> | <i>25 45.9450709</i> | <i>80 02.7394146</i> | <i>970249</i> | <i>521690</i> |
| <i>I4</i> | <i>25 45.6974742</i> | <i>80 02.7413943</i> | <i>970249</i> | <i>520190</i> |
| <i>I5</i> | <i>25 45.4498774</i> | <i>80 02.7433737</i> | <i>970249</i> | <i>518690</i> |
| <i>I6</i> | <i>25 45.2022804</i> | <i>80 02.7453526</i> | <i>970249</i> | <i>517190</i> |
| <i>I7</i> | <i>25 44.9546833</i> | <i>80 02.7473310</i> | <i>970249</i> | <i>515690</i> |
| <i>I8</i> | <i>25 44.7070860</i> | <i>80 02.7493091</i> | <i>970249</i> | <i>514190</i> |
| <i>I9</i> | <i>25 44.4594886</i> | <i>80 02.7512867</i> | <i>970249</i> | <i>512690</i> |
| <i>I10</i> | <i>25 44.2118911</i> | <i>80 02.7532638</i> | <i>970249</i> | <i>511190</i> |
| <i>K1</i> | <i>25 46.4386342</i> | <i>80 02.4875215</i> | <i>971609</i> | <i>524690</i> |
| <i>K2</i> | <i>25 46.1910381</i> | <i>80 02.4895107</i> | <i>971609</i> | <i>523190</i> |
| <i>K3</i> | <i>25 45.9434419</i> | <i>80 02.4914995</i> | <i>971609</i> | <i>521690</i> |
| <i>K4</i> | <i>25 45.6958455</i> | <i>80 02.4934878</i> | <i>971609</i> | <i>520190</i> |

| | | | | |
|-----|---------------|---------------|--------|--------|
| K5 | 25 45.4482489 | 80 02.4954757 | 971609 | 518690 |
| K6 | 25 45.2006523 | 80 02.4974632 | 971609 | 517190 |
| K7 | 25 44.9530554 | 80 02.4994502 | 971609 | 515690 |
| K8 | 25 44.7054585 | 80 02.5014368 | 971609 | 514190 |
| K9 | 25 44.4578614 | 80 02.5034230 | 971609 | 512690 |
| K10 | 25 44.2102641 | 80 02.5054087 | 971609 | 511190 |
| V1 | 25 46.4498940 | 80 04.2230545 | 962089 | 524690 |
| V2 | 25 46.2022958 | 80 04.2249837 | 962089 | 523190 |
| V3 | 25 45.9546975 | 80 04.2269124 | 962089 | 521690 |
| V4 | 25 45.7070990 | 80 04.2288408 | 962089 | 520190 |
| V5 | 25 45.4595005 | 80 04.2307687 | 962089 | 518690 |
| V6 | 25 45.2119017 | 80 04.2326962 | 962089 | 517190 |
| V7 | 25 44.9643028 | 80 04.2346233 | 962089 | 515690 |
| V8 | 25 44.7167038 | 80 04.2365500 | 962089 | 514190 |
| V9 | 25 44.4691047 | 80 04.2384762 | 962089 | 512690 |
| V10 | 25 44.2215054 | 80 04.2404021 | 962089 | 511190 |

Table 4: Sediment Sampling Stations

| Station | X (ft) | Y (ft) | Lat (DM) | Long (DM) |
|----------------|---------------|---------------|-----------------|------------------|
| M01 | 961615 | 521463 | 25 45.9178000 | 80 04.3137001 |
| M02 | 966617 | 525086 | 25 46.5100000 | 80 03.3971000 |
| M03 | 969050 | 520324 | 25 45.7211001 | 80 02.9597999 |
| M04 | 966842 | 517422 | 25 45.2446000 | 80 03.3660001 |
| M05 | 960824 | 515855 | 25 44.9930001 | 80 04.4650000 |
| M06 | 964691 | 515884 | 25 44.9933001 | 80 03.7602000 |
| M07 | 968890 | 515967 | 25 45.0019999 | 80 02.9946999 |
| M08 | 966753 | 509712 | 25 43.9720000 | 80 03.3924000 |
| M09 | 971122 | 515828 | 25 44.9764999 | 80 02.5879999 |
| M10 | 966905 | 514331 | 25 44.7343001 | 80 03.3585999 |
| M11 | 966814 | 515883 | 25 44.9907000 | 80 03.3732000 |
| M12 | 964588 | 518002 | 25 45.3430000 | 80 03.7761000 |
| M13 | 967477 | 521325 | 25 45.8881080 | 80 03.2451810 |

| | | | | |
|------------|--------|--------|---------------|---------------|
| <i>M14</i> | 971410 | 517510 | 25 45.2537410 | 80 02.5333990 |
| <i>M15</i> | 969583 | 515565 | 25 44.9348899 | 80 02.8688759 |
| <i>M16</i> | 964326 | 516577 | 25 45.1080921 | 80 03.8256853 |
| <i>M17</i> | 965494 | 516577 | 25 45.1067204 | 80 03.6127647 |
| <i>M18</i> | 966663 | 516577 | 25 45.1053436 | 80 03.3998443 |
| <i>M19</i> | 967831 | 516577 | 25 45.1039615 | 80 03.1869242 |
| <i>M20</i> | 968999 | 516577 | 25 45.1025743 | 80 02.9740043 |
| <i>M21</i> | 967831 | 514554 | 25 44.7699833 | 80 03.1895720 |
| <i>M22</i> | 966079 | 517589 | 25 45.2730219 | 80 03.5049877 |
| <i>M23</i> | 968999 | 514554 | 25 44.7685964 | 80 02.9766621 |
| <i>M24</i> | 968415 | 517589 | 25 45.2702575 | 80 03.0791375 |
| <i>M25</i> | 969583 | 517589 | 25 45.2688675 | 80 02.8662128 |
| <i>M26</i> | 964326 | 518600 | 25 45.4420711 | 80 03.8230665 |
| <i>M27</i> | 965494 | 518600 | 25 45.4406991 | 80 03.6101359 |
| <i>M28</i> | 966663 | 518600 | 25 45.4393219 | 80 03.3972056 |
| <i>M29</i> | 967831 | 518600 | 25 45.4379395 | 80 03.1842756 |
| <i>M30</i> | 968999 | 518600 | 25 45.4365519 | 80 02.9713458 |
| <i>M31</i> | 971391 | 514012 | 25 44.6763069 | 80 02.5414030 |
| <i>M32</i> | 965494 | 514554 | 25 44.7727415 | 80 03.6153927 |
| <i>M33</i> | 968415 | 515565 | 25 44.9362795 | 80 03.0817907 |
| <i>M34</i> | 971999 | 515677 | 25 44.9504049 | 80 02.4283980 |
| <i>M35</i> | 966970 | 519730 | 25 45.6254598 | 80 03.3397311 |
| <i>M36</i> | 966079 | 515565 | 25 44.9390433 | 80 03.5076210 |
| <i>M37</i> | 965459 | 521288 | 25 45.8844069 | 80 03.6131150 |
| <i>M38</i> | 967247 | 515565 | 25 44.9376640 | 80 03.2947057 |
| <i>M39</i> | 966431 | 523204 | 25 46.1994990 | 80 03.4334160 |
| <i>M40</i> | 968657 | 523230 | 25 46.2012009 | 80 03.0275779 |
| <i>M41</i> | 970263 | 514564 | 25 44.7687658 | 80 02.7462646 |
| <i>M42</i> | 963742 | 517589 | 25 45.2757659 | 80 03.9308838 |
| <i>M43</i> | 973930 | 514564 | 25 44.7643613 | 80 02.0779718 |
| <i>M44</i> | 963157 | 516577 | 25 45.1094599 | 80 04.0388189 |
| <i>M45</i> | 972935 | 516286 | 25 45.0498199 | 80 02.2568955 |
| <i>M46</i> | 970263 | 518094 | 25 45.3514822 | 80 02.7416081 |
| <i>M47</i> | 963742 | 515565 | 25 44.9417866 | 80 03.9334973 |
| <i>M48</i> | 973930 | 518008 | 25 45.3328791 | 80 02.0733759 |
| <i>M49</i> | 964981 | 519730 | 25 45.6278037 | 80 03.7022053 |
| <i>M50</i> | 970947 | 519730 | 25 45.6207269 | 80 02.6147847 |
| <i>M51</i> | 972935 | 519730 | 25 45.6183379 | 80 02.2523127 |
| <i>M52</i> | 969953 | 521452 | 25 45.9061752 | 80 02.7937504 |
| <i>M53</i> | 971941 | 521452 | 25 45.9037932 | 80 02.4312636 |
| <i>M54</i> | 964981 | 523174 | 25 46.1963249 | 80 03.6977354 |

| | | | | |
|------------|--------|--------|---------------|---------------|
| <i>M55</i> | 964910 | 513542 | 25 44.6064381 | 80 03.7231592 |
| <i>M56</i> | 966079 | 513542 | 25 44.6050644 | 80 03.5102536 |
| <i>M57</i> | 967247 | 513542 | 25 44.6036855 | 80 03.2973482 |
| <i>M58</i> | 968415 | 513542 | 25 44.6023013 | 80 03.0844431 |
| <i>M59</i> | 969583 | 513542 | 25 44.6009120 | 80 02.8715382 |
| <i>M60</i> | 964326 | 514554 | 25 44.7741128 | 80 03.8283034 |

Appendix C
Material Safety Data Sheets

Reviewed October 2011

Section 1. Identity

Product Name: **NOTOXhisto**

| Cat# | Description | | SDL Prod ID |
|--------|-----------------------------|--------------|-------------|
| 614-01 | NOTOXhisto | 1 gallon/pkg | 00344 |
| 614-05 | NOTOXhisto 5 gallon | 5 gallon/pkg | 00345 |
| 614-15 | NOTOXhisto 15 ML Containers | 50 vials/pkg | 00347 |
| 614-30 | NOTOXhisto 30 ML Containers | 50 vials/pkg | 00351 |
| 614-60 | NOTOXhisto 60 ML Containers | 50 vials/pkg | 00353 |
| 614-90 | NOTOXhisto 90 ML Containers | 50 vials/pkg | 00354 |

Manufacturer/Supplier: Scientific Device Laboratory, 411 Jarvis Avenue, Des Plaines, IL 60018
Phone 847-803-9495

Emergency Information: In case of a chemical emergency, spill, fire, exposure or accident contact Scientific Device Laboratory (847) 803-9495 or CHEMTREC 1-800-424-9300 or 703-527-3887

Section 2. Hazardous Ingredients/Identity Information

Components: Aqueous alcoholic solution with other hydroxylated compounds. (90% non aromatic alcohols)
Product consists of an aqueous solution of stabilizing chemicals.

Section 3. Physical/Chemical Characteristics

Boiling Point: 165°F
Flash Point 118°F
Specific Gravity: 1.044
Vapor Pressure (mmHg): N/A
Vapor Density (AIR=1): N/A
Melting Point: N/A
Evaporation Rate: vd >1
Solubility in H₂O: soluble
Appearance: clear
Odor: none
Consists of: aqueous solution of stabilizing chemicals

Section 4. Fire and Explosion Hazard Data

Flash point: 118°F
Flammable limits: unknown
LEL/UEL: N/A
Extinguishing medium: water
Special Fire Fighting Procedures: none found
Unusual Fire and Explosion Hazards: none known

Section 5. Reactivity Data

Stability: stable
Condition to avoid: swallowing
Reagent incompatibility: not known
Hazardous decomposition or By-products: none known

Hazardous polymerization: does not occur
Conditions to avoid: freezing or mixing with organic solvents

Section 6. Health Hazard Data

Routes of entry: ingestion: unknown
Inhalation unknown
Skin: unknown
Ingestion: avoid ingestion
Health Hazards: none known in final concentration
Carcinogenicity: none known
Signs and symptoms of exposure: unknown
Medical conditions aggravated by exposure: unknown
Emergency First Aid Procedures: skin contact: wash hands or area thoroughly for 15 minutes with water and soap. Respiratory: Wash with water

Section 7. Precautions for Safe Handling and Use

Steps to be taken if material is spilled: clean with cloth - Discard in flame retardant receptacle.
Waste Disposal Method: no special treatment, can be discarded down drain barring any local restrictions for alcohol
Precautions to be taken in Handling and Storage: store at room temperature
Other Precautions: none

Section 8. Control Measures

Respiratory Protection: mask preferred
Ventilation: respiratory mask suggested
Protective Gloves: chemical resistant gloves
Protective Clothing: Chemical resistant
Work/Hygiene Practices: good general microbiology techniques
Eye Protection: chemical safety goggles

Section 9. Transportation

UN 1987 Alcohol N.O.S. (Aqueous Ethanol Solutions) Class 3 Group III

Scientific Device Laboratory (SDL) will not be responsible for damages of any kind resulting from the use or reliance upon such information. No representations, or warranties either express or implied of merchantability, fitness for a particular purpose or of any other nature are made hereunder with respect to the information set forth herein or to the product to which the information refers. All statements made hereinto are provided in good faith and is believed to be correct as of the date hereof. However SDL makes no representation to the comprehensiveness of such information. It is expected that individuals receiving the information will exercise their independent judgment in determining it appropriate use.

Revision History

| CR NUMBER | REVISION |
|-----------|----------|
| 0908-001 | 00 |
| 0211-001 | 01 |
| 0511-001 | 02 |
| 0911-007 | 03 |



| | |
|---------------------|---|
| Health | 3 |
| Fire | 0 |
| Reactivity | 0 |
| Personal Protection | |

Material Safety Data Sheet Nitric Acid, 20% w/w MSDS

| Section 1: Chemical Product and Company Identification | |
|--|---|
| Product Name: Nitric Acid, 20% w/w Catalog Codes: SLN1942 CAS#: Mixture. RTECS: Not applicable. TSCA: TSCA 8(b) inventory: Nitric acid, 70%; Water Cl#: Not applicable. Synonym: Chemical Name: Not applicable. Chemical Formula: Not applicable. | Contact Information: Sciencelab.com, Inc. 14025 Smith Rd. Houston, Texas 77396 US Sales: 1-800-901-7247 International Sales: 1-281-441-4400 Order Online: ScienceLab.com CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300 International CHEMTREC, call: 1-703-527-3887 For non-emergency assistance, call: 1-281-441-4400 |

| Section 2: Composition and Information on Ingredients | | |
|---|-----------|-------------|
| Composition: | | |
| | | |
| Name | CAS # | % by Weight |
| Water | 7732-18-5 | 86 |
| Nitric acid, fuming | 7697-37-2 | 14 |
| Toxicological Data on Ingredients: Nitric acid, fuming: VAPOR (LC50): Acute: 67 ppm 4 hour(s) [Rat]. | | |

| Section 3: Hazards Identification |
|---|
| <p>Potential Acute Health Effects: Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant), of ingestion, of inhalation. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.</p> <p>Potential Chronic Health Effects: Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant), of ingestion, of inhalation. Non-sensitizer for skin. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist</p> |

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. Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:

If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on the victim's exposed skin, such as the hands : Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive to explosive in presence of reducing materials, of combustible materials, of organic materials.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:

Corrosive liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage**Precautions:**

Keep locked up Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Never add water to this product In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as reducing agents, combustible materials, metals, alkalis. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage:

May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package. Corrosive materials should be stored in a separate safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection**Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

Nitric acid, fuming TWA: 2 CEIL: 4 (ppm) TWA: 5 CEIL: 10 (mg/m3) Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Disagreeable and choking. (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.

Color: Clear Colorless.

pH (1% soln/water): Acidic.

Boiling Point: The lowest known value is 82.6°C (180.7°F) (Nitric acid, fuming). Weighted average: 97.56°C (207.6°F)

Melting Point: May start to solidify at -41.6°C (-42.9°F) based on data for: Nitric acid, fuming.

Critical Temperature: Not available.

Specific Gravity: Weighted average: 1.05 (Water = 1)

Vapor Pressure:

The highest known value is 45 mm of Hg (@ 20°C) (Nitric acid, fuming). Weighted average: 21.38 mm of Hg (@ 20°C)

Vapor Density: The highest known value is 0.62 (Air = 1) (Water).

Volatility: Not available.

Odor Threshold: The highest known value is 0.29 ppm (Nitric acid, fuming)

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility: Easily soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances:

Extremely reactive or incompatible with alkalis. Highly reactive with metals. Reactive with reducing agents, combustible materials. Slightly reactive to reactive with organic materials, acids.

Corrosivity:

Highly corrosive in presence of steel, of aluminum, of zinc, of copper. Corrosive in presence of stainless steel(304). Slightly corrosive to corrosive in presence of stainless steel(316). Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute toxicity of the vapor (LC50): 479 ppm 4 hour(s) (Rat) (Calculated value for the mixture).

Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.

Other Toxic Effects on Humans: Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 8: Corrosive liquid.

Identification: : Nitric acid, solution (Nitric acid, fuming) : NA2031 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:

Pennsylvania RTK: Nitric acid, 70% Massachusetts RTK: Nitric acid, 70% TSCA 8(b) inventory: Nitric acid, 70%; Water SARA 302/304/311/312 extremely hazardous substances: Nitric acid, 70% SARA 313 toxic chemical notification and release reporting: Nitric acid, 70% CERCLA: Hazardous substances.: Nitric acid, 70%;

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):

CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):

R26- Very toxic by inhalation. R35- Causes severe burns.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 0

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 11:00 AM

Last Updated: 05/21/2013 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.