PONTOON BOAT USE

Purpose

This Water Quality & Hydrology Group procedure describes processes and guidelines to be followed when conducting sediment sampling using a pontoon boat at reservoirs.

Scope

This procedure applies to all RRES-WQH staff and contract personnel who conduct work on the boat.

In this procedure

This procedure addresses the following major topics:

Hazard Control Plan

The hazard evaluation associated with this work is documented in Attachment 1: Initial risk = **medium**. Residual risk = **low**. Work permits required: **none**.

First authorization review date is one year from group leader signature below; subsequent authorizations are on file in group office.

Signatures

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Approved by. M. Alexander, Team Leader	Date: 9/27/04
Approved by. S. Rae, RRES-WQH Safety Committee Chair	Date: Oct. 2004
Approved by. S. Rae, RRES-WQH Group Leader	Date: Oct. 2004

General Information About This Procedure

Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Hazard Control Plan	4
2	Trip Plan for Boating	1
3	Pontoon Boat Checklist	1
4	USGS Type E Heavy Duty Crane, E-53 Sounding Reel and Ponar Sediment Sampling Procedure	3

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
1	3/96	New document.
2	8/97	Annual review
3	8/01	Annual review
4	6/04	Annual review
5	9/04	Level 2 Resumption Walkdown Changes; eliminated raft procedures

Who requires training to this procedure

All RRES-WQH staff and contract personnel, and all persons accompanying them, will have read this Procedure before using the boat.

Training method

The training requirements are on-the-job training by a previously trained individual. This training will be documented in accordance with the procedure for training (RRES-WQH-QP-024, *Training*).

The person who is designated ***Trip Leader*** by the RRES-WQH Group Leader or Operations Team Leader, must also complete the following additional training:

- For **boating Trip Leaders**, the training method for this procedure shall include a minimum of 8 hours of boater safety training by approved instruction. Classes conducted by the State of New Mexico or the Coast Guard Auxiliary shall satisfy this training requirement.

General Information About This Procedure

Prerequisites

In addition to training to this procedure, *every* member of the boat crew must demonstrate to the *Trip Leader* current training for the following prior to participating in a boat trip:

- Standard Red Cross First Aid
- Adult Cardiopulmonary Resuscitation (CPR)
- Training as specified in:
  - RRES-WQH-SOP-002, *General Field Work*
  - RRES-WQH-SOP-003, *Vehicle Operation*
  - RRES-WQH-SOP-004, *Radio and Cellular Phone Use*
  - RRES-ES-Field, *General Field Safety for All*
  - RRES-ES-Driving, *Driving and Towing Safety for All Employees*

And, *most importantly*, all boat crew must be competent and confident swimmers in good physical condition and fit for duty. Persons not meeting these qualifications shall notify the *Trip Leader* in advance of any boat activity. Trip Leader shall consult with the Group Leader if there is a concern about a team member's fitness for duty.

In addition, comprehension of and authorization to RRES-WQH-SOP-002, *General Field Work,* and RRES-ES-Field, *General Field Safety for All,* is required.

References

The following documents are referenced in this procedure:

- LANL-RRES-WQH-SOP-024, *Training*
- LANL-RRES-WQH-SOP-003, *Vehicle Operation*
- LANL-RRES-WQH-SOP-002, *General Field Work*
- LANL-RRES-WQH-SOP-012, *Sediment Sampling*
- LANL-RRES-WQH-SOP-047, *Spring and Surface Water Sampling*
- LANL-RRES-ES-Field, *General Field Safety for All*
- LANL-RRES-ES-Driving, *Driving and Towing Safety for All Employees*
- U.S. Coast Guard Boating Manual: Federal Requirements and Safety Tips for Recreational Boats
- State of NM Boating Safety Manual.

Note

Actions specified within this procedure, unless preceded with "should" or "may," are to be considered mandatory guidance (i.e., "shall").

Background

Need for boat

As part of the environmental surveillance program at Los Alamos National Laboratory, the sampling of surface water and sediments helps to determine background levels of potential environmental contaminants and to detect any above-background concentrations potentially caused by Laboratory activities.

Water and sediment samples are collected along the Rio Grande and at Cochiti, Abiquiu, Heron, El Vado and Rio Grande Reservoirs.

Safety concerns

Primary health and safety concerns are bodily injuries, drowning and hypothermia resulting from boat accidents.

Additional hazards associated with field work are addressed in:

- RRES-WQH-SOP-002, *General Field Work*
- RRES-WQH-SOP-003, *Vehicle Operation*
- RRES-ES-Field, *General Field Safety for All*
- RRES-ES-Driving, *Driving and Towing Safety for All Employees*

Hazards specific to boat operation include collisions, running aground, lightning strikes, falling overboard, and prolonged exposure to cold water.

Hazards specific to sampling lake sediments include finger/hand injury while operating the ponar grab sampler, crane, cable and winch.

Review the Hazard Control Plan, Attachment 1 to this procedure.

Boat description

RRES-WQH currently uses an 18.5 ft pontoon boat with a 75 hp two-cycle outboard motor for water and sediment sampling. The boat has a maximum capacity of 6 persons or 900 pounds. The boat is transported on a tandem-axle trailer equipped with running lights, safety chains, and requires a 2 5/16 in. ball for towing.

Using the boat

Boating equipment list

- Type III Coast Guard approved personal floatation device (PFD) for each person on the boat
- Type IV Coast Guard approved PFD (life ring) with 30 ft of rope
- Coast Guard approved fire extinguisher
- Coast Guard approved distress flag
- Paddle
- Anchor and anchor line
- Boat registration and owner's manuals
- Copies of appropriate IWD/Work Authorization & SOP's
- Worker authorization for all participants
- Distress whistle or air horn
- Adequate fuel and injector oil in proper storage containers
- Tool kit
- Key for boat
- Spare battery
- Depth finder
- HSR-2 approved first aid kit
- Satellite phone
- GPS navigational unit
- Appropriate sampling supplies and documents
- Sampling PPE
- Appropriate decon containers and water supply
- Appropriate clothing and personal gear (sun protection, cold/wet weather protection, drinking water)
- Rope (towing, utility)
- Bailing bucket
- Sample retrieval assembly with ponar grab sampler
- Waste bags or receptacle

Note: See Attachment 3 for **Pontoon Boat Checklist**

Using the boat, continued

Pre-trip preparations for boating activities

Prior to any boating activity, a Trip Leader shall be designated by the RRES-WQH Group Leader. The Trip Leader shall be responsible for the following pre-trip preparations:

Step	Action
1	Review training records of all trip participants for compliance with the procedures. All participants will be familiarized with the potential hazards of boating. Trip participants will be instructed to practice the two-person rule during boat trips by working in pairs at all times.
2	Conduct a field inspection of the following boat equipment: • Gas is fresh and is stored in a proper container with spark arrestor • Gas and oil has been mixed per the outboard motor manufacturer's specifications • Batteries-main & spare, fully charged • Fire extinguisher, fully charged • Navigation lights, working condition • PFD's, good condition and of sufficient quantity • Boat registration is current and valid
3	Conduct a field inspection of the following trailer equipment: • Ball hitch and safety chains • Trailer running lights • Trailer tire pressure • Spare tire and jack • Trailer registration is current and valid • Trailer lock with key
4	Ensure that at least one person has experience in towing and backing trailers and in loading and unloading the boat at the water. A spotter must be present to assist the driver during backing, loading, and unloading operations. Comprehension of RRES-WQH-SOP-003, *Vehicle Operation*, and RRES-ES-Driving, *Driving and Towing Safety for All Employees,* with emphasis on trailer towing is required.
5	Ensure that the boat's maximum capacity of 900 pounds is not exceeded.

Using the boat, continued

Monitor weather

Monitor weather forecasts prior to launching boat trips. If high winds, rain, snow, and/or thunderstorms are predicted and hazardous conditions exist, the Trip Leader shall postpone/reschedule the event.

Submit trip plan

Prior to departure, submit **for approval** a Trip Plan (Attachment 2) to the RRES-WQH Office. For multi-day trips, leave with the supervisor or designee a detailed itinerary and the plans for checking in.

When leaving Los Alamos County, you must be placed on official Laboratory travel status. Complete the appropriate travel documentation and submit to the Group Office.

If your time of return will be after 5:00 p.m., make arrangements to check in with your supervisor or Point-of-Contact when you return.

Begin work

Upon arrival at put in site and prior to boarding and launching of watercraft, the Trip Leader(s) shall conduct a safety briefing and emergency plan review. Special conditions may exist (e.g., use of insect repellant) which may be addressed at this time or during the coarse of the work period.

— Life jackets must be worn at all times when aboard the boat! —

Sample collection

Sampling surface water, sediments and springs shall be conducted under the following SOP's

- RRES-WQH-SOP-002, General Field Work
- RRES-WQH-SOP-012, Sediment Sampling
- RRES-WQH-SOP-047, Spring and Surface Water Sampling
- Sampling Crane and Winch Procedure – Attachment 4.

In Case of Emergency

In case of injury

Activities involving boat use are usually conducted at remote locations outside of the Los Alamos emergency response area. Local police, State Police, ambulance, and hospital/clinic contact numbers must be identified and included in the Trip Plan and Hazard Control Plan. Many sampling locations are outside of cell phone/radio signal/satellite range.

In case of injury of a worker while in the field, perform the following steps:

Step	Action
1	Safety First. Make sure the area is safe for you and injured co-worker.
2	Notify EM&R (667-6211) or 911.
3	Administer first aid as appropriate.
4	If injuries allow safe transport, aid in transport of injured person to nearest hospital or Occupational Medicine Group (ESH-2) medical station.

NOTE: When dialing 911 on a cellular phone, be aware that the call **will not** reach the Los Alamos Police Department or Los Alamos Fire Department dispatch. Have the 911-dispatch relay necessary information to the appropriate local police or state police.

Reference RRES-WQH-SOP-002, *General Field Work*, and RRES-ES-Field, *General Field Safety for All,* for additional information.

Boating accident

Notify the local authorities and the RRES-WQH Office in a timely fashion. The RRES-WQH Group Leader will notify appropriate Laboratory organizations such as the RRES Division Office, or Laboratory Emergency Management Response (EM&R).

Records Resulting from This Procedure

Records The following records are generated as a result of this procedure:

- Approved Trip Plan

Click here to record self-study training to this document.

HAZARD CONTROL PLAN

Scope

The work to be performed is described in the procedure RRES-WQH-SOP-013, *Pontoon Boat Use.*

Potential hazards

Potential hazards associated with the work are:

A. Slips, trips, and falls
B. Injury resulting from vehicle operation or accident
C. Pinch points from accidental contact from moving equipment
D. Lifting injury
E. Drowning
F. Hypothermia, hyperthermia, sun exposure
G. Lightning strikes
H. Other hazards as described in RRES-WQH-SOP-002, *General Field Work*, Attachment 1, and RRES-ES-Field, *General Field Safety for All,* Attachment 1.

Initial risk level

For each hazard, list the likelihood and severity, and the resulting initial risk level (before any work controls are applied, a determined according to LIR300-00-01, section 7.2)

Overall *initial* risk: ☐ Minimal ☐ Low ☒ Medium ☐ High

Operational requirements

List applicable Laboratory, facility, or activity operation requirements directly related to the work:

☐ None ☒ List: Work Permits required? ☐ No ☒ List:

Mitigating hazards

Describe how the hazards listed above will be mitgated (e.g., safety equipment, administrative controls, etc.):

A. Slips, trips, and falls
   - Be observant and walk cautiously in areas and on surfaces - of concern.
   - Minimize threat of slick surfaces.
   - Use appropriate footwear.
   - Use hand rails.
   - Keep work areas and walkways free of materials, debris, and obstructions.

B. Injury resulting from vehicle operation or accident
   - Strictly comply with LIR402-1320-01, *Implementation Requirements for Vehicular Safety,* RRES-WQH-SOP-003, *Vehicle Operation*, RRES-ES-Driving, *Driving and Towing Safety for All Employees*

HAZARD CONTROL PLAN, continued

Mitigating hazards (continued)

C. Pinch points from accidental contact with moving equipment
- Secure all equipment during transport.
- Two-person rule will apply during all loading, unloading, launching, docking and trailering operations.
- Comply with requirements for conducting work as described in RRES-WQH-SOP-002, *General Field Work*, and RRES-ES-Field, *General Field Safety for All.*

D. Lifting injury
- Use mechanical devices (hand trucks, and carts) to lift or move heavy loads when appropriate.
- Evaluate the load: consider the size, weight, and shape of the object.
- Do not lift more than can be handled comfortably; get help if necessary.
- Set feet solidly shoulder-width apart with one foot slightly ahead of the other for good balance and stability.
- Keep back as straight as possible.
- Bend at the hips.
- Never turn at the waist or twist to change direction or to put down an object.
- Turn whole body, including your feet, and crouch to lower the object.

E. Drowning
- Must be competent and confident swimmers in good physical condition and fit for duty.
- Must wear a Type III coast guard approved PFD (personal flotation device) at all times on the water.
- In the event of a person falling overboard:
  - Toss the person a life saving device or floating cushion, time is essential
  - If underway, slow the boat and keep the person in view
  - Approach the person from downwind
  - Signal other nearby boats to be aware of person in water
- In the event the victim is injured, a rescuer - with PFD and safety line attached - may enter the water to assist the victim.
- Always turn off the motor when alongside someone in the water.

HAZARD CONTROL PLAN, continued

Mitigating hazards (continued)

F. Hypothermia, hyperthermia, sun exposure

- Hypothermia:
  - — Dress warm and stay dry.
  - — Put on rain gear before it starts to rain or snow.
  - — Put on additional clothes before starting to shiver.
- Hyperthermia:
  - — Drink water in moderate amounts regularly---do not wait until you are thirsty.
  - — Avoid alcohol, caffeine, and soda---these liquids are not water substitutes.
  - — Wear lightweight clothing and a wide-brimmed hat.
  - — Schedule activities that require the most exertion in early morning or late afternoon, if possible.
- Sun exposure:
  - — Wear sunscreen on all exposed skin to avoid skin damage.
  - — Wear sunglasses with polarized lenses to protect eyes, reduce glare, and improve vision, especially when working on water or snow.

G. Lightning strikes

See Lightning Hazards Section of RRES-WQH-SOP-002, *General Field Work,* and RRES-ES-Field, *General Field Safety for All.*

- If a determination is made to shut down operations while on the water:
  - — Proceed immediately to the nearest docking point
  - — Secure the watercraft
  - — Disembark
  - — Seek shelter
- Do not attempt to load, unload, trailer, etc. until lightning danger has passed.

Training

List knowledge, skills, ability, and training necessary to safely perform this work (check one or both):

☒ Group-level orientation and training to this procedure.

☒ Other → See training prerequisites on procedure page 3.

Wastes, residual materials

Are there any wastes and/or residual materials? (check one) ☒None ☐List:

HAZARD CONTROL PLAN, continued

Residual risk Consider the administrative and engineering controls to be used, the residual risk level (as determined according to LIR300-00-01, section 7.3.3) is (check one):

☐ Minimal ☒ Low ☐ Medium (requires approval by Division Director)

Emergency actions Emergency actions to take in event of control failures or abnormal operation (check one):

☐ None ☐ List:

Step	Action
1	Administer first aid.
2	Contact the RRES-WQH group office.
3	Contact EM&R at 667-6211.

Controlled copies are considered authorized. Work will be performed to controlled copies only. This plan and procedure will be revised according to RRES-WQH-QP-023, *Preparation, Review, and Approval of Procedures*, and distributed according to RRES-WQH-QP-021, *Document Distribution*.

TRIP PLAN FOR BOATING

Date(s) of Event:

Scope of Work:

Trip Participants:

Name	Assignment	Contact Information

Itinerary: (Dates, Departure and Arrival Times, Lodging)

Check in Plan:

Phone Numbers:		
Emergency- 911 or 667-6211		
Group Leader:	Office:	Home:
Deputy Group Leader:	Office:	Home:
Team Leader:	Office:	Home:
Group Office:	Office:	
Group Office:	Office:	
Police:		
Sheriff:		
Hospital/Clinic:		
Ambulance:		
Other:		

Notes:

PONTOON BOAT CHECKLIST

_____ FUEL and OIL
- ─ Unleaded Gasoline minimum octane rating 87.
- ─ Motor oil, TC-W3 only.

_____ Gas Credit Card
_____ Battery/charge + backup
_____ Depth finder operational
_____ Trailer brake and signal lights
_____ Keys - boat & truck
_____ Trailer hitch padlock & key
_____ Trailer spare tire
_____ Jack
_____ Safety tow chains
_____ Grease trailer hubs before and after each use
_____ Tools
_____ Extra spark plugs, Plug wrench, small wire brush
_____ Spare prop and Prop wrench
_____ Spare drive belt
_____ Tow rope
_____ Anchor and line
_____ Utility rope
_____ GPS, navigational aids
_____ Fire Extinguisher
_____ Personal Flotation Device's
_____ Ring or Cushion (Type IV) flotation device
_____ Pool Rod
_____ Whistle or air horn
_____ Paddle
_____ Bailing bucket
_____ First Aid kit
_____ Drinking water
_____ Sunscreen
_____ Flashlight batteries, spares
_____ Phone, battery charged, power adapter
_____ Nalgene wash tanks
_____ Carboy with DI decon water supply
_____ Tarp
_____ Bungees, Tie downs
_____ Camera
_____ Sampling assembly
_____ Ponar sampler (pre-cleaned)
_____ Sampling supplies (cooler, ice, scoops, bowls, nitrile gloves, sample containers etc.)

USGS Type E Heavy Duty Crane, E-53 Sounding Reel and Ponar Sediment Sampling Procedure

DESCRIPTION

The Type E crane is used when heavy sediment samplers are required. The Type E crane is collapsible, and is made from aluminum stock with stainless steel bolts and stainless steel shafts. The reel mount is drilled to install a Type A-55, B-56 or E-53 sounding reel which clamps to the crane assembly. This crane is usually used for samplers from 100 pounds (45 kg) and up. The approximate weight of the crane is 60 pounds (27 kg.)

The E-53 Sounding Reel is used to position sample collection equipment and is mounted on the crane. The reel has an effective drum circumference of 2 feet (61 cm) and has 165 feet (50.3 m) of 0.125 inch (0.32 cm) cable or 200 feet (61 m) of 0.10 inch (0.254 cm) cable. It is equipped with a USGS-type computing depth indicator. It comes with a friction brake which is controlled by a permanently attached crank on the right side of the reel, which is located on the end of the jack shaft next to the double "V" drive pulley. A hand crank which is fitted to the pulley end of the jack shaft is used for retrieving the sampler.

The Wildco® Ponar Type Grab sampler is used for collecting bottom materials such as sand, gravel and clay. It can be used in streams, lakes reservoirs and the ocean. This modified Van Veen type self-tripping sampler has center hinged jaws and a spring loaded pin that releases when the sampler makes impact with the bottom. The top is covered with a stainless steel screen with neoprene rubber flaps which allows water to flow through for a controlled descent. The ponar is constructed of stainless steel with zinc plated steel arms and weights. A pin prevents premature closing. The ponar is 150mm x 150mm (6" x 6") and weighs 11 kg (24 lbs.) Sample volume is 2400ml.

STORAGE AND TRANSPORT

- The sampling crane shall remain mounted on the boat at all times.
- Detach ponar and store clean. Lock sampling jaws in open position by carefully adjusting the hinged arms to align the pin holes. Insert the standard pin in the aligned pin holes.
- During transport/trailering to the site, the sampling crane must remain in the collapsed position and secured with bungee tie-down cords or other appropriate restraints. While navigating on the lake the crane may be collapsed or left in sampling position dependant on water and wind conditions.

GENERAL OPERATION

This procedure requires two people, a crane and reel operator and a ponar handler. The crane and reel operator may use leather gloves for positioning and handling the crane. The ponar handler shall use nitrile sampling gloves. At all times use caution avoiding injury from pinch points or dropping the sampler.

CRANE SET UP

Raise the sampling crane arm by grasping the handle cross bar and lifting. A levering foot bar is provided for ease in lifting. Brace the sampling crane arm by connecting the two upper brackets into position.

CABLE and PONAR PREPARATION AND USE

1. Retract the sampling crane, by grasping the hand bar with both hands and gently pulling back. Slowly lock assembly in place by depressing the foot bar. Keep hands, fingers, and feet away from pinch points.
2. Using the handle on the right side of the reel to control the clutch, slowly un-spool approx. three feet of cable guiding cable clip forward over the brass cable wheel and the two black rubber cable wheels.
3. Position the ponar on the floor of the boat and attach the cable clip to the ponar connector tab. Adjust cable length to reach ponar. Do not attempt to attach the ponar to the cable by lifting it. Replace the standard pin with the spring loaded pin and hold in place. Suspend the ponar so that it is weighted. The ponar is tripped when it comes to rest on a solid surface or lake bottom.
4. After the ponar sampler is attached, the crane operator will extend the sampling crane arm by grasping the hand bar and pushing the assembly forward. Pull the foot bar, locking the assembly into place.
5. To lower the Ponar sampler, stand on the right hand side of the sampling crane, and slowly shift the clutch handle (right side of reel) forward engaging the clutch and allowing the sampler to contact the surface of the water in a controlled manner. Zero the depth indicator. Release the sampler and cable into the lake by fully engaging the clutch. The winch and sampler assembly work by gravity so the sampler must be allowed to “free fall”. During the deployment of the sampler keep all objects clear of the left reel hand crank.
6. Once the sampler has reached the bottom of the lake, read and record the depth from the depth indicator.
7. Fully disengage the clutch and retrieve the sampler from the bottom of the lake using the left reel hand crank to reel it in. Once the sampler reaches the surface, engage the clutch and fully retract

the sampling crane. Next engage the clutch to allow for the Ponar sampler to be placed over the sample preparation receptacle.

8. Once over the sample preparation receptacle, the ponar handler will position the sampler, open the sampling jaws and extract the sample.
9. If required, the ponar sampler will be deployed multiple times using the above procedure until an adequate volume of sample is retrieved. For specific sediment sampling instructions refer to RRES-WQH-HCP-012, Sediment Sampling.
10. When sample collection is completed, prepare the assembly for transport.