ER-SOP-20273, R0

INSPECTING AND RETREIVING STORM WATER SAMPLES FROM GLOBAL WATER WS750 SAMPLERS

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Procedure Owner: Steven Veenis	Signature: /s/ Steve Veenis	Date: 7/14/2015

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1. PURPOSE AND SCOPE

This procedure describes the process for inspecting Global Water WS750 storm water samplers and retrieving storm water samples from locations at Los Alamos National Laboratory (LANL) where storm water sampling activities are conducted. This procedure applies to the LANL project technical staff and subcontractor personnel conducting sampler operation and maintenance activities at storm water sampler stations.

2. BACKGROUND

Global Water WS750 samplers may be used in a variety of applications across the Laboratory to collect storm water runoff. Global Water Samplers coupled with sample actuators can be used at Individual Permit (IP) Site Monitoring Areas (SMAs), Regional PCB Background Study locations, Consent Order-driven storm water monitoring stations, environmental surveillance stations, and other projects such as the Aluminum Study and the Urban Study. Global Water samplers are designed to automatically collect water when the water surface is high enough to trigger an actuator to fill sample bottles. Field team members are required to inspect the sampling station while retrieving water samples and at other intervals determined by the individual project or as directed by work orders issued by project personnel.

A LANL Project Leader is the primary person with responsibility for the steps in this procedure. Several Field Team Members (LANL personnel or subcontractor personnel) may be appointed with responsibility for a subset of sampling stations defined as a route.

3. REFERENCES

Manufacturer's Manual for Global Water WS750 Sampler, Operation overview
Manufacturer's Manual for PDA/Global Logger II Software
EP-DIV-SOP-10008, Installing, Setting up, and Operating Storm Water Samplers
EP-DIV-GUIDE, How to Perform Technical Quality Control and Data Entry in Maintenance Connection
EP-DIR-AP-10003, Records Management Procedure for ADEP Employees

4. TRAINING PREREQUISITES

Personnel performing this procedure will be familiar with the most current versions of the following procedures:

- EP-DIR-AP-10003, Records Management Procedure for ADEP Employees
- EP-DIV-SOP-10008, Installing, Setting up, and Operating Storm Water Samplers

If the work will require any on-site excavation activities, obtain an Excavation Permit in accordance with ISD-101-.017.0, Excavation/Fill/Soil Disturbance Permit Process.

5. PRECAUTIONS AND LIMITATIONS

This procedure is used with an approved Integrated Work Document (IWD) and/or other safety documents as required. Review IWDs for facility specific requirements, training, precautions and access controls.

If subsequent rain events occur before all sampler locations have been visited after the first rain event, finish the route to collect the first-event samples (safety permitting).

Inspections may be discontinued during periods or conditions that make sampler locations dangerous for worker safety or prevent personnel from safely accessing sampler locations (e.g., weather-related events such as flash floods, flooding, lightning, wildfires, hail, icy roads, deep snow, high winds, red flag conditions, and LANS operations).

6. EQUIPMENT AND TOOLS

- Global Water WS750
- One 1-gal glass bottle
- One 1-gal polypropylene bottle
- Two Charged batteries (Unit battery and spare)
- Distilled water
- Copy of this procedure
- Copy of Integrated Work Document (IWD)
- Appropriate tools in tool box
- Appropriate gloves
- Tubing: Intake and Pump
- Plastic wire “zip” ties
- Backpacks (if needed)
- *Leatherman* type tool
- Radio
- Pager
- Cell phone (Government cell phone only in secure areas)
- Necessary access and station keys
- Rebar and rebar caps
- Hose clamps
- 2-3 lbs. sledge hammer
- Label and lock for unit
- Issued Work order
- Personal Digital Assistant (PDA) equipped w/Volt Meter

<u>Additional Equipment for Retrieving Storm Water Samples</u>

- Coolers with ice or Blue Ice®
- IP Project Maps

6. EQUIPMENT AND TOOLS (continued)

- Nitrile gloves
- Replacement sample bottles (glass and plastic) with lids
- Marker pen (permanent, waterproof)
- *Wypall* Towels
- De-ionized water
- Ball point pen
- Zip lock bags
- Safety glasses with side shields

7. STEP-BY-STEP PROCESS DESCRIPTION

7.1 Preparing for Fieldwork

Subcontract Manager or LANL Field Team Member

[1] Receipt of a work order indicates that sampler has been approved by the Field Team Lead. Ensure that work is scheduled to be completed by the target date appearing on the work order(s).

[2] Distribute work order(s) to Field Team Member(s).

[3] Inform the Field Operations designee of the schedule for sampler inspection work and locations up to a week (preferred) before but no later than the day before (for minor changes) to be added to the appropriate plan of the day.

[4] Conduct pre-job briefing with field personnel using the current Integrated Work Document. Obtain worker signatures on new or newly-revised IWDs. Two people are required for field work. Work should only be done during daylight hours. Extended work hours, if needed, must be approved by a supervisor.

[5] For work at locations operated by Weapons Facility Operations or Nuclear Environmental Sites, notify the appropriate access control before traveling to those locations. The IWD Part II will address specific requirements and training for these locations.

Field Team Member

[6] Obtain any necessary additional paperwork before conducting this work, including IWD's, and excavation permits (if necessary).

[7] Gather the required equipment (see section 6.0) for the work to be done.

7.1 Preparing for Fieldwork (continued)

[8] Set watch(s) to the precise Mountain Standard Time (MST) (not daylight saving time). This time can be found at www.time.gov (select the Mountain Time Zone – Arizona, Non-Navajo, no daylight saving option). This step is to ensure the sampler clock can be synchronized to the current local time.

7.2 Inspecting the Sampler

Field Team Member

[1] If conditions prevent a sampler inspection, document the conditions on the work order and notify the STR or designee within 24 hours. Multiple attempts can be documented on the original inspection work order up to the target date. After the target date, return work order to the Tracking and Reporting (TR) Team for reissuance (if necessary).

[2] **Item 1** on work order (see example in Attachment 1): Enter the date and time inspection is initiated and the names and Z numbers of the field personnel performing the work in the upper right corner of the work order. List the route lead first. If more than two personnel conduct the work, enter the additional names in the "Addition Notes" section (**Item 16**).

[3] Remove the lock from the sampler and open the front door.

[4] **Item 2**: Verify and document the sampler is ON and its condition upon arrival by checking the "Yes" or "No" box. Explain any non-functional status in the third column.

[5] **Item 3**: Verify and document the indication light above the ON/OFF toggle switch is illuminated by checking the "Yes" or "No" box. Explain any non-functional status in the third column.

[6] **Item 4**: If sample bottles are empty, check "Yes", draw a line through page 2 of the work order, and initial and date the strike-through.

If sample bottles were filled, retrieve the water according to the steps in Section 7.3 and return to next step below.

[7] **Item 5**: Verify and document the sampler is set to the correct Mountain Standard Time +/- no more than 1 minute by checking "Yes" or "No" box. If the sampler is set incorrectly, reprogram for the correct Mountain Standard Time. Describe the work performed and correction applied (e.g. "Global Water datalogger clock was X minutes slow") in third column. If two samplers are deployed at a location, ensure each is set to within one minute of the other.

7.2 Inspecting the Sampler (continued)

[8] **Item 6**: Verify and document that equipment, manufacturer, model, serial number, specification and configuration match the work order header on page 1 by checking the "Yes" or "No". If the equipment deployed does not match the equipment listed on the work order, ensure you are at the correct location. If the location is verified, check "No" and update inaccurate information in the third column. If more space is needed, continue notes in the "Additional Notes" section.

[9] **Item 7**: Verify and document power supply function. Use the PDA to check the voltage of the battery and record the voltage in the third column. Check "Yes" or "No" to indicate if battery voltage is acceptable upon departure from the station (generally ≥11.7 V but may vary by configuration).

If maintenance is necessary and can be performed at the time of inspection, describe the work performed in third column. If more space is needed, continue notes in the "Additional Notes" section.

If maintenance cannot be completed at the time of inspection, then describe the condition in third column, and follow up with description of work needed at **Item 14**.

[10] **Item 8**: Verify and document the battery was replaced by checking the "Yes" or "No" box. If battery was replaced record the final voltage in the third column.

[11] **Item 9**: Verify and document the sample tubing passed a pump test upon departure from the station by checking the "Yes" or "No" box.

Check the condition of sample tubing and pump tubing. Push "Test Pump 1" and "Test Pump 2" buttons on the control panel to ensure pumps are functioning properly. If maintenance (e.g., clearing the tube, replacing the tube) is necessary and can be performed at the time of inspection, describe the work performed in third column. If more space is needed, continue notes in the "Additional Notes" section.

If maintenance cannot be completed at the time of inspection, then describe the condition in third column, and follow up with description of work needed at **Item 14**.

[12] **Item 10**: Verify all cable and electrical connections are attached and secure upon departure from the site by checking the "Yes" or "No" box.

If maintenance (e.g., tightening connection, replacing cables) is necessary and can be performed at the time of inspection, describe the work performed in third column. If more space is needed, continue notes in the "Additional Notes" section.

If maintenance cannot be completed at the time of inspection, then describe the condition and work needed in third column, and follow up with description of work needed at **Item 14**.

7.2 Inspecting the Sampler (continued)

[13] **Item 11**: Verify and document that programming is correct for the Global Water with the PDA by checking the "Yes" or "No" box. Describe any work performed in the third column.

[14] **Item 12**: Verify and document that the intake tubing is clear and free of any debris or materials that may block or prevent water from being collected by checking the "Yes" or "No" box. Describe any work performed in the column.

[15] **Item 13**: Verify and document any maintenance completed while on site that is not previously documented on work order (e.g. clearing or replacing tubing, repositioning intake) by checking the "Yes" or "No" box. Describe any work performed in the third column.

Maintenance items may include (but are not limited to) site clearing, resetting line position, additional equipment installations, or sampler diagnostics or repair.

Check the physical condition of the sampler including the actuator and intake line for correct location and height in the channel. If maintenance is necessary and can be performed at the time of inspection, perform the work and describe in the third column. If more space is needed, continue notes in the "Additional Notes" section.

[16] **Item 14**: Verify and document any maintenance needed that could not be completed while on site by checking the "Yes" or "No" box. Describe any needed maintenance in the third column. If more space is needed, continue notes in the "Additional Notes" section. A separate work order for the station maintenance will be issued by the TR team.

Maintenance items may include (but are not limited to) battery replacement, tubing replacement, site clearing, or sampler diagnostics or repair.

[17] **Item 15**: Document that water was retrieved by checking the "Yes" or "No" box. If water was collected but not retrieved document the reason in the third column.

[18] **Item 16**: Document any additional notes or site information in the "Additional Notes" section.

[19] Ensure the unit is "On". Replace and secure the front door of the Global water sampler with the lock.

[20] **Item 21**: Have another field crew member review the completed work order(s) for accuracy and completeness and sign and date "Reviewed by Signature" line on page 2 of work order.

7.2 Inspecting the Sampler (continued)

[21] **Item 22**: The lead field crew member will review the work order(s) for accuracy and certify that the information submitted is "true, accurate, and complete" by signing and dating "Lead Signature" line on page 1.

Subcontract Manager or LANL Field Team Member

[22] Return completed original work orders to the Tracking and Reporting (TR) Team by noon the first business day following completion of the work.

If original work orders must remain with collected samples (Section 7.4), return photocopies of work orders to the TR Team by noon the day following completion of field work. Stamp or write "Copy" on the work order returned.

7.3 Retrieving Storm Water Samples

Field Team Member

[1] Don nitrile gloves and safety glasses.

[2] **Item 17**: Record the bottle type, date, time, and volume the Global Water collected for each bottle.

[3] Follow the Flow Chart for Sample Retrieval (Attachment 2), and refer to the "Earliest Sample Collect Date" in header on work order page 1.

If the "Earliest Sample Collect Date" field is empty OR the Global Water sample collection date is ON or AFTER that date, samples may be retrieved per the volume requirements given on work order. Continue with step 4 below.

If the Global Water sample collection date is BEFORE the "Earliest Sample Collect Date":

- Indicate "not a measurable storm event" in "Additional Notes" section, **Item 16**.
- Record total volume retrieved as "0" in **Item 19**.
- Return all water to the ground at the station.

[4] Remove filled and partially-filled bottles.

[5] Hobo datalogger, if present, should be retrieved from its sample bottle and placed in a plastic bag. Label the outside of the bag with the sample collection date, time, and station number. Return water from this sample bottle to the ground at the station.

7.3 Retrieving Storm Water Samples (continued)

[6] **Items 18 and 19**: Add up total volume of water collected and confirm the collected volume of water in glass and poly matches the required volume in the header of the work order page 2. The volume of water required to complete a sample set varies by station.

[7] For samples retrieved, place lids onto the sample bottles and securely seal.

[8] Write the date and time collected, station number, and the initials of each individual who collected each retrieved sample bottle. Obtain the sample collection date and time from the PDA.

[9] Return any excess water that exceeded the maximum amount required to the ground at the station. Note "not retrieved" in the "Comments" column next to the bottle(s) affected.

[10] **Item 19**: Record the total volume (estimate to the tenth of a liter) of sample retrieved in glass containers and the total volume of sample retrieved in polyethylene containers.

[11] Wipe dry all retrieved sample bottles and place in a cooler with enough blue ice (or equivalent) to maintain the required preservation temperature. Do not use dry ice unless approved in writing by IP Project Lead.

[12] Protect plastic containers from possible puncturing and glass containers from breakage with cushioning material as needed. Ensure the drainage hole at the bottom of the cooler is sealed in case of sample container leakage. If the sample requestor deems it necessary, place sufficient absorbent material in the cooler to absorb all liquid in the event of sample bottle breakage.

[13] **Item 20**: Record the date and time sample cooling was initiated. Provide initials of the person initiating cooling.

7.4 Delivering Samples

**If samples were not retrieved proceed to Section 8.*

Field Team Member

[1] Transport retrieved samples to the IP Storm Water Processing Facility in a government vehicle or approved subcontractor vehicle only.

[2] Samples must remain under the positive control of the individual(s) who has retrieved them.

[3] **Item 23**: Relinquish samples to the Sample Processor by signing "Relinquished By".

7.5 Perform Review and Acceptance

Subcontract Manager or LANL Field Team Member

[1] Conduct an internal review of forms for errors. Correct errors as necessary.

[2] Return completed original forms to the TR Team by noon the following business day after completion of the field work.

TR Team

[3] Process each form according to EP-DIV-GUIDE, How to Perform Technical Quality Control and Data Entry in Maintenance Connection.

8. RECORDS PROCESSING

Field Team Member

[1] Ensure that documents generated by the performance of this procedure are processed as follows:

Record Identification	Record Type Determination	Protection/Storage Methods	Processing Instructions
20273-1, Global Water Sampler Inspection and Sample Retrieval	Record	N/A	When complete, submit the work order(s) to the Stormwater Tracking and Reporting Team

Stormwater TR Team

[2] Ensure that documents generated by the performance of this procedure are processed as follows:

Record Identification	Record Type Determination	Protection/Storage Methods	Processing Instructions
20273-1, Global Water Sampler Inspection and Sample Retrieval	Record	N/A	When the records are ready for final disposition, the record is transferred to Records Management in accordance with EP-DIR-AP-10003, *Records Management Procedure for ADEP Employees.*

9. ATTACHMENTS

Attachment 1, Example of Global Water Sampler Inspection and Sample Retrieval Form
Attachment 2, Flow Chart for Sample Retrieval

APPENDIX 1

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EXAMPLE OF GLOBAL WATER SAMPLER INSPECTION AND SAMPLE RETRIEVAL FORM

SOP-20273-1 **Global Water Sampler Inspection and Sample Retrieval**

Work Order ID: REG-45568 **Project ID: P-ES-3772**

Regional Studies : ACID-ROM-2(a) : RA090101

Project: Test project for sampler inspection new procedures

Route:

Target Date: 4/24/2015

Earliest Sample Collect Date: 8/17/2012

Next Scheduled Battery Replacement:

Bottle Set Configuration

Trip level 14 Day Hold Time

Program

1 Date:_____ Time:_____

Name/Z#:_____

Name/Z#:_____

22 Lead Signature:_____

"I confirm the information as recorded is true, accurate and complete."

Equipment	MFG	Model	Serial No.
Global Water Sampler	Global Water	GL-500	092295335

Sampler Inspection Tasks		
ON ARRIVAL		
Is sampler ON and functioning properly upon arrival?	❒Yes ❒No	2
Is indication light above ON/OFF toggle switch illuminated?	❒Yes ❒No	3
Are all sample bottles empty?	❒Yes ❒No	4
Is PDA and datalogger time <1 min (MST) and do both have the same time?	❒Yes ❒No	5
ON DEPARTURE		
Is equipment configuration correct? (Refer to equipment list above).	❒Yes ❒No	6
Record battery voltage. Is voltage acceptable?	❒Yes ❒No	7
Was battery replaced?	❒Yes ❒No	8
Does sampler pass the pump test?	❒Yes ❒No	9
Are electrical connections secure?	❒Yes ❒No	10
Is sampler programmed and configured to sample?	❒Yes ❒No	11
Is sampler intake tubing clear/free of debris?	❒Yes ❒No	12
If any maintenance completed, check Yes: Describe.	❒Yes ❒No	13
If any follow-on maintenance is required, check Yes: Describe.	❒Yes ❒No	14
Was sample volume retrieved?	❒Yes ❒No	15
Additional Notes: 16		

APPENDIX 1

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EXAMPLE OF GLOBAL WATERSAMPLER INSPECTION AND SAMPLE RETRIEVAL FORM (continued)

SOP-20273-1 **Global Water Sampler Inspection and Sample Retrieval**

Work Order ID: REG-45568 **Project ID: P-ES-3772**

Complete if sample bottles contain water OR to record displayed message

18 Glass Bottles: 1 L-Min 2 L-Max | Poly Bottles: 0 L-Min 0 L-Max

Bottle #	Bottle Type	Date	Time	Volume	Comments
17 1	❒P ❒G				
2	❒P ❒G				

	Date	Time	Init
20 Cooling by:			
Filtration by:			
Preservation by:			

19 Total Volume Retrieved Glass (liters): | Total Volume Retrieved Poly (liters):

21 Reviewed By Signature: | Date:

Relinquished by Signature	Date:	Time:	Received by Signature	Date:	Time:
23					

LANL PERSONNEL USE ONLY (Initials and dates)

Accepted _____ Tech QC _____ FTL _____

APPENDIX 2

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FLOW CHART FOR SAMPLE RETRIEVAL