


APPENDIX SECTION

APPENDIX 1


The following example forms are provided in this appendix:

1. **MONITORING SITE LOCATION - INFORMATION COLLECTION & SUMMARY INSTRUCTIVE:** This instructive provides guidelines of relevant information that must be collected from each site-location. The instructive can be used to organize the information to ease subsequent analysis.
2. **SITE ASSESSMENT FORM:** This form details all information to be collected during site assessment to be used in site selection process and/or data quality clarification.
3. **SITE INFORMATION FORM:** This form details all information to be collected relevant to the site in terms of location, direction, safety, contacts, etc.
4. **STATION INFORMATION FORM:** This form details the information relevant of the station. The information can be used to reconstruct the station in case something happens (*i.e.* hurricane) or to provide a brief description of the station, *i.e.* in the Reserve web page.

	MONITORING SITE LOCATION - INFORMATION COLLECTION & SUMMARY INSTRUCTIVE			
	Identification Number	Revision	Effective Date	Pages
				Page 1 of

The purpose of this instructive is to provide a guideline of relevant information that must be collected from each site location. The instructive can be used to organize the information to ease subsequent analysis.

1. Project Name.
2. Detail the monitoring objectives.
3. Detail key data quality requirements.
4. Translation of objectives and requirements into field characteristics.
5. Attach maps used to mark preliminary site locations.
6. Specify preliminary site locations. Names or labels to be used.
7. List descriptive and relevant information of each site:
 - 7.1 Environmental Factors
 - 7.1.1 Mixing conditions. List Rivers, streams, and other sources that can affect mixing. Distance from the site location and other relevant information.
 - 7.1.2 Possible turbulence problems.
 - 7.1.3 Structures or other sources that can cause variable flow conditions.
 - 7.1.4 Tidal range or maximum and minimum water levels and flows.
 - 7.1.5 Wave action information.
 - 7.1.6 Sediment type.
 - 7.1.7 Relevant water physical properties.
 - 7.1.8 Type of relevant vegetation that can affect monitoring quality data.
 - 7.1.9 Type of relevant animals that can affect monitoring quality data.
 - 7.1.10 Possible areas that can cause run-off problems.
 - 7.1.11 Any relevant information about biofouling.
 - 7.1.12 Human activities or impacts that could affect monitoring quality data.
 - 7.1.13 Upstream activities or potential debris sources that could produce hazards to monitoring sites.
 - 7.2 Accessibility and Safety Issues
 - 7.2.1 State if there are any relevant laws that could affect site location.
 - 7.2.2 State if there are any potential problems to access these sites year round: weather factors, need of special access authorization, permits, other.
 - 7.2.3 Describe preliminary access data. How these sites will be accessed? (car, boat, directions, distance, *etc.*).
 - 7.2.4 List any necessary contact information.
 - 7.2.5 List any special requirements that must be met to access any particular site.
 - 7.2.6 State any relevant survey information.
 - 7.2.7 State any relevant data transfer information (*e.g.* potential problems).
 - 7.2.8 List obvious safety issues to be considered.
 - 7.3 Community Issues
 - 7.3.1 Describe community activities that could impact monitoring.
 - 7.3.2 State if community acceptance of site location/monitoring activities must be obtained.
8. Describe possible problems or concerns that can appear.
9. Specify major funding and budget considerations.

	SITE ASSESSMENT FORM		
	Identification Number	Revision	Effective Date
			Pages Page 1 of 2


Project Name	
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1. LOCATION-DIRECTIONS-ACCESS

Site name		Station ID	
Site different from site specified in MONITORING SITE LOCATION			NO YES
If YES describe New Information			

2. SITE DESCRIPTION

ENVIRONMENTAL FACTORS	
Mixing Issues. Any streams or rivers close to site. Distance to site.	
Turbulence/Bubbles	
Structures that can cause variable flow	
Water velocity or flow conditions	
Water depth	
Approximate width	
Tidal or water level issues	
Wave action	
Type of soil	
Description of floor surface (i.e. slope)	
Sediment accumulation?	
Run-off influence?	
Description of vegetation	
Human Impacts (Description of human activities in the sampling area)	
Possible environmental Hazards	
Other	
ACCESSIBILITY	
Survey	
Data Transfer	
SAFETY	
Any safety issue to consider	
COMMUNITY	
Community issues to consider	
STATION CHARACTERISTICS	
Any considerations for station structure and maintenance	
Any other relevant information	

	SITE ASSESSMENT FORM		
	Identification Number	Revision	Effective Date
			Page 2 of 2

3. ASSESSMENT ACTIVITIES

3.1 ACTIVITIES AND MEASUREMENTS

Activity/Measurement	Result or reference where to find the results	Responsible

3.2 PROBLEMS AND SOLUTIONS

Potential Problem	Solution Characteristics or Ideas

SITE ASSESSMENT FORM

Purpose: The purpose of this form is to record all relevant information during the site assessment.

Form structure and fine-tuning: Even though the form has a certain structure, the assessment team can add or delete sections to personalize the form to their needs and make it user friendly. For example, if several sites are in the same river, there is no need to fill one form for each site. The additional information can be added under each section as required. If a section is deleted, the title must be kept and a note of N/A (not applicable) must be added in order to assure the information was considered.

1. LOCATION-DIRECTION-ACCESS

The information in this section is intended to add any useful new information found during the assessment and/or in case a new site must be selected.

- Site name & Station ID: Station name and ID used for identification.
- New Information: All new information to located and access the new site must be detailed.

For example, to access the site it was found that a new gate must be open; or landmarks are added to complement the driving direction in the water, other factor may influence the access in the future, e.g. vegetation, ice formation.

2. SITE DESCRIPTION

2.1 ENVIRONMENTAL FACTORS

- Factor & Description: Each relevant factor must be assessed and significant information recorded. It must be stated if future assessments are needed for any particular factor. For example, the site assessment is performed during a dry season, and high impact run-off areas are detected; therefore, possible assessment during raining period may be needed.

All possible impacts (*i.e.* human activities) identified during planning or through the assessment must be evaluated; documenting location, description, magnitude and possible risk or links associated between the activity and water quality.

2.2 ACCESSIBILITY

- Detail if the station can be surveyed and if it is possible to transfer data, *i.e.* via telemetry.

2.3 SAFETY

- Safety issues previously addressed are no longer an issue, and/or new safety issues must be taken into consideration.

2.4 COMMUNITY

- It is possible that some community issues previously addressed are not so and must be recorded, and/or new issues must be taken into consideration.

2.5 STATION CHARACTERISTICS

- What station would work must be recorded. For example, during planning it was decided to construct the station using a fixed structure. During site assessment, it is evaluated that the fixed station will not work given community issues and the best station will be a buoyant one.

2.6 ANY OTHER RELEVANT INFORMATION

- During site assessment the planning decisions are evaluated against the real settings; therefore, new relevant information may appear.


3. ASSESSMENT ACTIVITIES

3.1 NECESSARY ACTIVITIES AND MEASUREMENTS

- Activity/M Measurement: Describe the activity or measurement to be performed.
- Result or reference where to find the results: Record the result of the activity/measurement or identify where the results are stored. The information must be recorded in such a way that the tracking of this information is easily accessed.
- Responsible: Name of the person responsible for the activity

3.2 PROBLEMS AND SOLUTIONS

- Potential Problem: Record the problem, new or old.
- Solution Characteristics or Ideas: Describe the solution or ideas to solve the problems

	SITE INFORMATION FORM			
	Identification Number	Revision	Effective Date	Pages
				Page 1 of 2

Project Name	
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1. LOCATION

1.1 Site name				1.2 Station ID	
1.3 Site is marked in map	YES	NO	1.4 Map name or title		
1.5 Name of the waterbody or watershed					
1.6 Latitude			1.7 Longitude		
1.8 Describe where the site is located (water, pier, marina, etc.)					

2. DIRECTIONS & ACCESS


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2.1 ROAD DIRECTIONS

2.1.1 Address				2.1.3 County	
2.1.2 State				2.1.4 Zip Code	
2.1.5 Description of how to reach the location (if needed attach photocopy of road map)					
2.1.6 Specify if there is any important landmarks or information that will help find or get to the site.					

2.2 WATER DIRECTIONS

2.2.1 Need to use boat ramp	YES	NO	2.2.2 Boat ramp proprietor	Public access	Private
2.2.3 Hours of operation			2.2.4 Fee	2.2.5 Ramp type	Concrete Dirt
2.2.6 Contact				2.2.7 Telephone	
2.2.8 Directions from boat ramp to site					
2.2.9 Need navigation map			YES	NO	
2.2.10 Need to cross any bridge that needs to be open			YES	NO	
2.2.11 Need to contact in advance to open bridge			YES	NO	
2.2.12 Contact				2.2.13 Telephone	
2.2.14 Tides or other precautions to consider					

	SITE INFORMATION FORM			
	Identification Number	Revision	Effective Date	Pages
				Page 2 of 2

2.3 IMPORTANT ACCESS INFORMATION			
2.3.1 Need special permit to access station	YES	NO	
2.3.2 Contact Name		email	
		email	
2.3.3 Telephone		2.3.4 Fax	
2.3.5 Need to do or get anything to access site (keys, call, etc.)			
2.3.6 Hours or schedule when site is accessible			
2.3.7 Any comments how to access the station			
2.3.8 Parking			
2.3.9 Toll		2.3.10 Traffic & Access concerns	
2.3.11 Restrooms			

3. EQUIPMENT

3.1 VEHICLES			
3.1.1 Need truck 4 by 4	YES	NO	
3.1.2 What type of vessel/s are needed			
3.2 WORKING GEAR			
3.2.1 Detail the working gear needed			

4. COMMUNICATION AND SAFETY

4.1 Cellular phone service			
4.2 Hospital		4.3 Address	4.4 Telephone
4.5 Fire/Rescue phone		4.6 Address	
4.7 Safety considerations			

SITE INFORMATION FORM

Purpose: The purpose of this form is to provide all relevant information of the monitoring site.

Form structure and fine-tuning: Even though the form has a certain structure, sections of this form can be added or delete to personalize it. For example, if several sites are in the same river, there is no need to fill one form for each site. The additional information can be added under each section as required. If a section is deleted, the title must be kept and a note of N/A (not applicable) must be added in order to assure the information was considered.

1. LOCATION

The information in this section is intended to locate the site as clearly as possible.

- 1.1 Site name Station name
- 1.2 Station ID: ID used for identification
- 1.3 Site is marked in map: A map is very helpful in locating sites.
- 1.4 Map name or title: Provide the name/s of the maps used.
- 1.5 Name of the waterbody or watershed: For example, Poropotank River in the York River watershed.
- 1.6 Latitude: provide the latitude in decimal degrees (as often found as an option on GPS) and in degrees, minutes, and seconds (for printed maps), or degrees and decimal minutes.
- 1.7 Longitude: provide the longitude in decimal degrees (as often found as an option on GPS) and in degrees, minutes, and seconds (for printed maps), or degrees and decimal minutes.
- 1.8 Describe where the site is located: a brief description where the site is located.

2. DIRECTIONS & ACCESS

The information in this section is intended to give precise directions of how to get to the site and what accessibility considerations must be taken.

2.1 ROAD DIRECTIONS

Address: Street address (if there is one).

State: Name of the State where the site is located

County: Name of the County where the site is located.

Zip Code: Zip code (if there is one)

Description of how to reach location: Provide as much information as possible of how to reach the site by car. If location is not familiar, include distance from highways, roads, detail street names, etc. It will be helpful to attach a map showing major streets, roads. If no map is available, a hand draw map will do it.

Specify if there is any important landmarks or information that will help find or get to the site: In some places it will be helpful to specify landmarks to give orientations (e.g. church, gas station, etc.) or any other information (e.g. stop in Grammy Store and ask for directions).

2.2 WATER DIRECTIONS

- Boat ramp proprietor (need to use boat ramp): If a boat ramp is needed, it is important to know if it is privately own or for public access.
- Contact & Telephone: Name of the persons and telephones if needed to access the ramp.
- Directions from boat ramp to site: Describe directions of how to get to the site from the boat ramp. A navigation map may be useful to locate the site. All navigation relevant information must be included; for example, if the station is located in a river that has many low water areas, these must be marked to alert the field crew.
- Contact & Telephone (need to contact in advance to open bridge): Name and telephones of person responsible of bridge operation.
- Tides or other precaution to consider: It is a good practice to get information of the ramp accessibility, what is the maximum depth at average low waters? (to have an idea of the type of boat that can be launched), parking availability, etc.

2.3 IMPORTANT ACCESS INFORMATION

- Contact & Telephone: Name and telephone of the person/s in charge of giving access to the site.
- Need to do or get anything to access site: Describe what actions must be taken to access the site. For example, get a key from a special place, open gates, call someone to open a gate, etc.
- Hours or schedule when site is accessible: State if there is a special time frame when the site is accessible (i.e. the park close at 16:00).

- Parking & Toll: Describe if there are any parking issues (*i.e.* the boat ramp in summer can be full. Parking alternative). If there are tolls, state each fee.
- Traffic or Access Concerns: State if there are any traffic concerns. For example, rush hours tips; if there are dirt roads that after rain are hard to travel hauling a boat; construction; possible closure given hunting; animal migration, etc.

3. EQUIPMENT

3.1 VEHICLES

- Need truck 4 by 4: Describe if a special truck is needed, for example, a truck 4 by 4 with a closed trunk to take gear.
- What type of vessel/s are needed: Describe type of vessels needed.


3.2 WORKING GEAR

- Detail the working gear needed: List all the necessary gear needed. Basic gear can be described as a general group (*i.e.* weather gear), however, specific gear, as sampling equipment, must be described in detail.

4. COMMUNICATION AND SAFETY

This section describes which cellular accessibility and emergency information.

- Cellular phone service: It is important to know what companies cover (if any) the site area in order to know what type of communication device to carry.
- Hospital Information & Fire Rescue Information: Information of emergency facilities near the site.
- Safety considerations: Describe if there is any contaminant (*i.e.* animal waste, sewage discharge), poisonous plants, or other safety considerations to be aware off.

	STATION INFORMATION			
	Identification Number	Revision	Effective Date	Pages
				Page 1 of 1

Project Name	
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1. STATION INFORMATION

1.1 Site name						
1.2 Type of water body						
1.3 Date installed				1.4 Time installed		
1.5 Latitude			1.6 Longitude			
1.7 Type of Configuration						
BUOYANT		FIXED STRUCTURE				
Surface Buoy Stationary Structure Subsurface	Existing Structure	Pier	Bridge	Piling	Wall	Other:
	Designed Structure	Pile	PVC	Wood	Tower	Other:
	On river & stream bank					
1.8 Information of the Guard-Pipe						
1.8.1 Guard-Pipe length				1.8.2 Distance from bolts to bottom		
1.8.3 Length of the rope use to hang the sensor inside the guard pipe (including couplings or knots)				1.8.4 Length of the rope use to hang the replacement sensor outside the guard pipe (including couplings or knots)		
1.8.5 Description of the Locking Safety System						
1.9 Configuration Information						
1.9.1 Basic description of the structure						
1.9.2 Survey data						
1.9.3 Other relevant information						

2. FIGURES OF SITE/STATION

STATION INFORMATION FORM

Purpose: The purpose of this form is to provide relevant information of the station.

Form structure and fine-tuning: Even though the form has a certain structure, sections of this form can be added or delete to personalize it.

1. STATION INFORMATION

1.1 Site name: Station or site name

1.2 Type of water body: provide the name of the water body where the station is located, e.g. James River Oligohaline.

1.3 Date: provide the date the station was installed.

1.4 Time installed: provide the time the station was installed.

1.5 Latitude: provide the latitude in decimal degrees (as often found as an option on GPS) and in degrees, minutes, and seconds (for printed maps), or degrees and decimal minutes.

1.6 Longitude: provide the longitude in decimal degrees (as often found as an option on GPS) and in degrees, minutes, and seconds (for printed maps), or degrees and decimal minutes.

1.7 Type of configuration: a briefly description of the type of station. For example, existing structure – pier.

1.8 Information of the guard-pipe: the idea of this section is to include all relevant information of the guard-pipe in case it needs to be rebuilt.

1.9 Configuration Information: provide information of the station configuration.

1.9.1 Basic description of the structure: provide a brief description of the station configuration. For example, if the station is located on a pier, description of the pier, dimension, relative location of the station on the pier, etc. are detailed.

1.9.2 Survey data: provide detail information of the survey data.

The information included in 1.7 and 1.8 will vary depending on the type of station. A rule of thumb is to include all the information that will be needed to reconstruct the station to achieve same monitoring depth.

2. FIGURES OF SITE/STATION

APPENDIX 5

Even though the 1.75" U-bolts are less expensive than the 8.75" U-bolts; there are some disadvantages in using them:

- It requires an on-land construction step.
- The station deployment process is more cumbersome.
- One pipe per column can only be used; no extension pipes can be employed if a higher penetration depth is required.

An example of securing the tower system to the PVC pipes using 1.75" U-bolts follows:

