



# Bulletin 28: Wet Site Guidelines

Updated: March 21, 2024

This operational guideline supplements [Bulletin 26: Treatment of Archaeological Materials](#)

## 1. Purpose

This document establishes the minimum standards for general excavation, handling, and interim care methods for artifacts recovered from wet site contexts under the authority of *Heritage Conservation Act* (HCA) permits, as administered by the Archaeology Branch (the Branch).

As each wet site encountered is unique, additional methods may be deemed appropriate on a case-by case basis. In addition to the archaeological methods herein, references have been provided that may be useful when planning wet site excavations. When wet sites are anticipated or encountered, appropriate methods for excavation, transportation, cleaning, short-term storage, and a long-term conservation plan should be determined in discussions with a wet site specialist and/or a conservator.

## 2. Background

Wet sites are water-saturated archaeological sites that preserve organic (particularly vegetal) artifacts as a result of anaerobic conditions (Croes 1976, Bernick 2019). These kinds of sites are often found in environments such as salt marshes, sloughs, lagoons, along coast lines, in peat bogs, in riverine environments, and beneath mud slides (Croes 1976). For the purposes of this document, the term wet site artifact refers to any artifact composed of a perishable material found in a wet site, or waterlogged, context.

The Archaeology Branch has the delegated authority to establish terms and conditions for permits issued under the HCA. Per Bulletin 26, the permit holder is responsible for the excavation, transportation, short-term care and storage of artifacts, and to ensure the appropriate long-term conservation and storage of materials recovered from waterlogged contexts. Given the characteristics of wet sites, the permit holder is responsible to ensure appropriate plans are in place prior to excavation of wet sites.

## 3. Assessing Wet Sites

Archaeological assessment methods can vary widely depending on the environment, the composition of the archaeological site, and the goals of the study. Some assessment methods may result in adverse impacts to archaeological sites. Please consider the following when planning archaeological assessments of wet sites.

### A. Surveying for Wet Sites:

Areas considered to have low potential for other types of archaeological sites may have high potential for saturated sites (Eldridge 2019), such as:

- salt marshes
- sloughs
- lagoons
- along coastlines
- in peat bogs
- in riverine environments
- old wells
- swales behind village sites
- beneath mud slides (Croes 1976).

### B. Non-Invasive Recording of Wet Sites:

It may be appropriate to use non-invasive methods to record wet sites when proposed development is not anticipated, or will not result in impacts to the site. For example, wooden fish weir complexes may be identified following pedestrian survey and adequately recorded by collecting geospatial data with a GPS device, photographing and/or sketching the general area, visible artifacts, and features, etc., without conducting subsurface testing. GPR and other remote sensing methods can also be used in wetlands.

### C. Invasive Recording of Wet Sites:

Subsurface testing breaches the unique preservation conditions of the anaerobic environment preserving the wet site materials. Once these waterlogged objects are exposed to oxygen they begin to decompose. Therefore, leaving wet site materials *in situ* should not be proposed as the primary management strategy for wet sites when they are encountered during subsurface testing or other land-altering activities.

Should reburial/leaving materials *in situ* be considered the best management strategy, justification must be provided by the permit holder, and a discussion with the Archaeology Branch and the affected First Nations must take place prior to implementation.

The permit applicant must include a wet site plan where waterlogged deposits are a possibility.

It is the permit holder's responsibility to conduct the research to determine whether they are likely to encounter waterlogged deposits during the course of their testing and/or alteration. In cases where encountering waterlogged deposits is not anticipated, it is still good practice to keep a wet site kit on site and to have discussed the plan with a wet site specialist.

## D. Indirect Impacts to Wet Sites

Consider impacts to unexcavated archaeological materials when planning excavations of wet sites. Artifacts, features, and archaeological deposits that are not removed from wet sites during excavation have the potential to be directly or indirectly impacted by archaeological assessments and/or development activities. These impacts may be immediate and/or long-term.

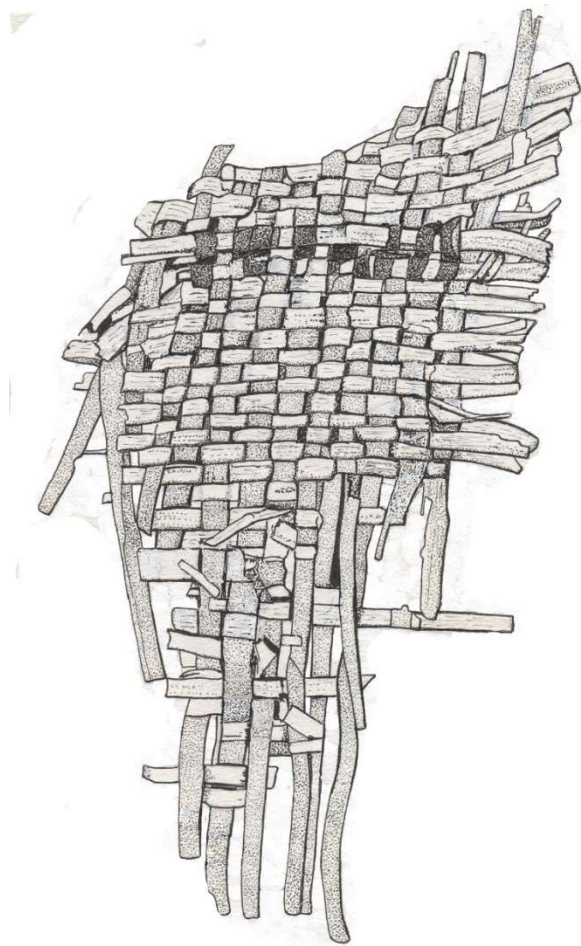


Figure 1. Illustration credit: Don Welsh (Semiahmoo First Nation)

Sound management recommendations carefully consider each development activity and involve discussions with a wet site specialist, the Archaeology Branch, and the affected First Nations. Post-excavation impacts should be monitored and documented as part of the permitted work. Potential long-term impacts to archaeological sites should be identified and management plan made in advance of development activities. When planning assessments, forming mitigation strategies, and providing management recommendations for wet sites, please consider the following:

- 1) Short-term dewatering systems (mechanical equipment used to remove groundwater) will likely become necessary during the excavation of wet sites.
  - a) These dewatering systems have the potential to adversely impact unexcavated archaeological materials when used within or nearby wet sites (Daugherty 1988; Davis et al. 2004).
  - b) The appropriate type of dewatering system and the extent of dewatering required will vary from site to site. Discuss dewatering approaches with a wet site specialist, the Archaeology Branch, affected First Nations, and the proponent prior to excavations, to limit adverse impacts and support best practices.
- 2) Long-term dewatering facilities, such as pump stations, have the potential to adversely impact wet sites by changing the level of ground saturation (Davis et al. 2004). Consider that large scale groundwater changes should be monitored post-excavation through groundwater monitoring wells.

3) Activities such as back-filling, capping, and operating heavy machinery overtop of archaeological sites have the potential to compress archaeological deposits.

## 4. Methods

Engage a wet site specialist and/or conservator when wet sites are anticipated to confirm appropriate methods for excavation, transportation, cleaning, short-term storage, and a long-term conservation plan. It is important to consider sampling needs before the excavation begins, and to discuss these with affected First Nations. This includes consideration of what will be kept, and what sorts of samples will be taken and how the integrity of these samples will need to be preserved during excavation. These wet site methods may be expanded as appropriate in Section 12.2 Heritage Inspection or Investigation permit applications, using the references provided in Section 6. All field staff must be made aware of wet site-specific procedures.

Additional support may be available through the Canadian Conservation Institute (CCI), the Royal British Columbia Museum (RBCM), the University of British Columbia's Laboratory of Archaeology (LOA), Simon Fraser University's Department of Archaeology, and from private wet site specialists.

### A. Excavation

Most wet sites should not be surprises during assessments/excavations with sufficient background research. Avoid this scenario as it will lead to unnecessary damage to belongings, delays to projects, increased project costs, and more work. If wet sites are encountered unexpectedly, stop work and call the Branch and a wet site specialist immediately for site-specific advice.

When wet sites are anticipated, to ensure field crews are adequately prepared, and to minimise unnecessary damage to these sensitive sites, consider the following:

- 1) Keep wet site artifacts wet at all times, including during the excavation process, and protect artifacts from direct sunlight, heat, wind and other elements whenever possible (Doran 2013, Bernick 2019). Use spray bottles or hoses, or cover in-situ items with cling film until they are removed for packing.

Field kits should include additional equipment specific to wet site excavation. Scott and Grant (2007), and Bernick (2019) provide detailed lists of items that may be useful. At a minimum, field kits should include:

- spray bottles, plastic and wooden implements for excavation
- soft brushes
- plastic containers and bags of various sizes
- corrugated plastic board
- cling film
- bubble-wrap
- polyethylene foam
- duct tape
- string for packaging and immobilizing artifacts
- a waterproof means of labelling artifacts (e.g., Tyvek or Duksbak paper).

- 2) Exposure to oxygen will darken the items very quickly. Take clear, detailed photos of wet site materials often throughout the excavation process, and prior to initial packaging and transport, to ensure a photo record exists should any adverse impacts occur during excavation, transportation, interim storage, or curation (Doran 2013).
- 3) Submerge artifacts in water immediately upon excavation to ensure no drying occurs.
- 4) Excavation methods must minimise damage to fragile and perishable organic artifacts:
  - a) Use wet screening and hydraulic excavation methods (the use of carefully-controlled water as a means of excavation) in wet sites to minimize risk of damage to fragile and perishable organic artifacts. Examples and descriptions of hydraulic excavation methods are provided in Gleeson and Grosso 1976, Daugherty 1988, Doran 2013, and Bernick 2019.
    - i) During hydraulic excavation, water pressure must be carefully controlled to allow removal of the matrix while avoiding damage to delicate artifacts (Gleeson and Grosso 1976, Daugherty 1988, Doran 2013, Bernick 2019).
    - ii) Screen size must follow the methods indicated in the associated Section 12.2 Heritage Inspection or Heritage Investigation permit application.
  - b) Metal implements (shovels and trowels) may damage wet site artifacts (Daugherty 1988, Doran 2013, Bernick 2019) as will excessive force. Use plastic or wooden implements with care, and combine with hydraulic excavation to ensure controlled and careful excavation.
  - c) Carefully support artifacts during the excavation process to minimise damage.
- 5) Carefully remove as much sediment and soil as possible from recovered wet site materials as soon as possible to prevent mold growth during interim storage.
  - a) Sediment and soil can be removed using water (during hydraulic excavation) and other non-metal implements such as soft brushes.
  - b) The structural support of the artifact must be taken into consideration during the sediment removal process. For example, if sediment or soil is holding the artifact together, or preventing the artifact from bending or collapsing, it may be appropriate leave the sediment intact and request that a conservator remove it, to minimize the risk of damage to the artifact (Bernick 2019).

## B. Packaging and Transport

Receptacles and packing materials must maintain the integrity of material during transportation and interim storage until transfer to the wet site specialist.

- 1) While awaiting transportation to the laboratory or storage facility:
  - a) submerge waterlogged artifacts in water,
  - b) protect material from heat and direct sunlight, and
  - c) keep the objects cool. Refrigerate material, whenever possible, to prevent drying and mold/algae growth.

If artifacts must be stored on site for any period of time following excavation, they must be inspected regularly to ensure they remain saturated as well as for mold growth or any other changes to their condition (Sease 1994, Scott and Grant 2007, Doran 2013, Bernick 2019). It is best to bring a fridge on site and store items in water in the fridge. If this is not possible, it is recommended that they be transferred to a fridge elsewhere on a daily or weekly basis.

- 2) When transporting artifacts, consider how best to support and immobilize the artifact while ensuring it remains saturated. Suggestions for transport packaging methods can be found in both Scott and Grant (2007) and Bernick (2019). Consider:
  - a) Packaging must not cause damage to the artifacts to ensure that they are delivered to the repository in the best possible condition. For example, if bubble wrap is used to keep the object(s) from sloshing in the water, each object should be covered in cling-film and the bubble wrap should be placed flat side towards the object so that the surface places more even pressure on the object(s).
  - b) If artifacts are being transported in the same container, they must be appropriately supported by packaging; containers must not be overpacked. Fragile artifacts may need to be packaged separately to prevent damage (Scott and Grant 2007).
- 3) Label each piece by placing a label on or near it, and then wrapping it or placing it in a container. Label each container clearly.

Consider packaging, transport, and storage solutions to minimise impacts to saturated materials and limit the times an item is unwrapped or opened:

- Label bags, containers, and the fridge to make it easy to relocate materials.
- A polaroid or printed photo of each piece minimises the number of times a bag or box needs to be opened.
- Develop a plan to replace water regularly.

It is recommended to keep a photo log with temporary artifact numbers. This will help the field team and the specialist minimize impacts to the artifacts.

### C. Care Outside of the Field

- 1) Waterlogged artifacts should be transported to a specialist as soon as possible following excavation. During interim storage, keep wet site artifacts in water, support artifacts with appropriate packaging, and refrigerate (Sease 1994, Bernick 2019).
  - a) The water in which artifacts are stored should be changed regularly to prevent mold growth (Scott and Grant 2007, Bernick 2019). Frequency of water changes should be determined with a wet site specialist.
- 2) During interim storage, artifacts should be inspected regularly for any changes to their condition (temperature, saturation, mold growth, ice formation). Cleaning may be necessary

at various stages during storage (Scott and Grant 2007, Bernick 2019). An inspection schedule as well as a cleaning plan should be determined with a wet site specialist.

## 5. Reporting and Permit Closure

Site records and permit reports will describe observations, archaeological methods, and curation/preservation approaches. Management recommendations will consider immediate impacts from ongoing excavation, short-term impacts from initial development activities, and long-term impacts following development (e.g., monitoring sites affected by dewatering facilities).

The permit holder must demonstrate that a repository has accepted collected materials before the permit can be closed.

Version Date	Noted changes
<b>October 18, 2023</b>	Creation of Bulletin
<b>March 21, 2024</b>	Increased content regarding surveying for wet sites and interim storage recommendations

## 6. References Cited

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