

**Washington Department of Natural Resources  
Derelict Creosote Piling Removal  
Best Management Practices  
For Pile Removal & Disposal**

The following Best Management Practices (BMPs) are adapted from EPA guidance (2005), Washington State Department of Transportation (WSDOT) methods and conservation activities as included in Joint Aquatic Resources Permit Application (JARPA) 2005, and Washington State Department of Resources (WADNR) “Standard Practice for the Use and Removal of Treated Wood and Pilings on and from State-Owned Aquatic Lands” 2005, as well as WADNR’s practical experience through managing piling removal projects since 2006.

The purpose of these BMPs is to control turbidity and sediments re-entering the water column during pile removal, and prescribe debris capture and disposal of removed piles and debris.

**BMP 1. PILE REMOVAL**

Crane operator shall be experienced in pile removal. Piles will be removed slowly. This will minimize turbidity in the water column as well as sediment disturbance. Pulled pile shall be placed in a containment basin to capture any adhering sediment. This should be done immediately after the pile is initially removed from the water.

**A. Vibratory extraction**

1) This is the preferred method of pile removal. Vibratory extraction shall always be employed first unless the pile is too decayed or short for the vibratory hammer to grip. After consultation with WADNR, the alternative options listed below may be used.

2) The vibratory hammer is a large mechanical device (5-16 tons) that is suspended from a crane by a cable. The hammer is activated to loosen the piling by vibrating as the piling is pulled up. The hammer is shut off when the end of the piling reaches the mudline. Vibratory extraction takes approximately 15 to 30 minutes per piling depending on piling length and sediment condition.

3) Operator will “Wake up” pile to break up bond with sediment.

- Vibrating breaks the skin friction bond between pile and soil.
- Bond breaking avoids pulling out a large block of soil – possibly breaking off the pile in the process.
- Usually there is little or no sediment attached to the skin of the pile during withdrawal. In some cases material may be attached to the pile tip, in line with the pile.

**B. Direct Pull**

1) This method is optional if the contractor determines it to be appropriate for the substrate type, pile length, and structural integrity of the piling. Vibratory extractor must be attempted first unless there is risk of greater disturbance of sediments.

2) Pilings are wrapped with a choker cable or chain that is attached at the top to a crane. The crane pulls the piling directly upward, removing the piling from the sediment.

#### C. Clamshell Removal

1) Broken and damaged pilings that cannot be removed by either the vibratory hammer or direct pull may be removed with either a clamshell bucket or environmental clamshell.

2) A clamshell is a hinged steel apparatus that operates like a set of steel jaws. The bucket is lowered from a crane and the jaws grasp the piling stub as the crane pulls up.

3) The size of the clamshell bucket shall be minimized to reduce turbidity during piling removal.

4) The clamshell bucket shall be emptied of material onto a contained area on the barge before it is lowered into the water.

#### D. Cutting

1) Is required if the pile breaks at or near the existing substrate and cannot be removed by other methods.

2) If a pile is broken or breaks during extraction, all of the methods listed below should be used to cut the pile.

a. Piles located in intertidal and shallow subtidal areas that are less than -10 feet deep MLLW shall be cut at least 2 feet below the mudline.

b. In subtidal areas that are greater than -10 feet deep MLLW, piles shall be cut at least 1 foot below the mudline.

c. Piles shall be cut off at lowest practical tide condition and at slack water. This is intended to reduce turbidity due to reduced flow and short water column through which pile must be withdrawn.

d. No hydraulic jetting devices shall be used to move sediment away from piles. Excavation of sediment in subtidal areas to expose broken piles shall be accomplished by divers using hand tools.

e. The contractor shall provide the location of all the broken and cut piles using a GPS.

### **BMP 2. BARGE OPERATIONS, WORK SURFACE, CONTAINMENT**

A. Barge grounding will not be permitted.

B. Work surface on barge deck or pier, or upland staging area shall include a containment basin for all treated materials and any sediment removed during pulling. Creosote shall be prevented from re-entering the water. Uncontaminated water run-off can return to the waterway.

- 1) Containment basin shall be constructed of durable plastic sheeting with continuous sidewalls supported by hay bales, ecology blocks, other non-contaminated materials, or support structure to contain all sediment and creosote. Containment basin shall be lined with oil absorbent boom.
- 2) Work surface on barge deck and adjacent pier shall be cleaned by disposing of sediment or other residues along with cut off piling as described in BMP #4.B.
- 3) Containment basin shall be removed and disposed in accordance with BMP #4.B or in another manner complying with applicable federal and state regulations.
- 4) Upon removal from substrate the pile shall be moved expeditiously from the water into the containment basin. The pile shall not be shaken, hosed-off, left hanging to drip or any other action intended to clean or remove adhering material from the pile.

### **BMP 3. DEBRIS CAPTURE IN WATER**

- A. A floating surface boom shall be installed to capture floating surface debris. The floating boom shall be equipped with absorbent pads to contain any oil sheens. Debris will be collected and disposed of along with cut off piling as described in BMP #4.
- B. The boom may be anchored with four or fewer ½ ecology blocks or a similar anchoring device. These anchors must be removed once the project is complete. The anchor system shall be located to avoid damage from vessel props to eelgrass, kelp, and other significant macroalgae species. The line length between the anchor and surface float shall not exceed the water depth as measured at extreme high tide plus a maximum of 20 percent additional line for scope. The buoy system shall include a subsurface float designed to keep the line between the anchor and surface float from contacting the bottom during low tide cycles. The subsurface float shall be located off the bottom a distance equal to 1/3 the line length
- C. The boom shall be located at a sufficient distance from all sides of the structure or piles that are being removed to ensure that contaminated materials are captured. The boom shall stay in its original location until any sheen present from removed pilings has been absorbed by the boom. BMP #3B may be used to keep the boom in its original location.
- D. Debris contained within boom shall be removed at the end of each work day or immediately if waters are rough and there is a chance that debris may escape the boom.
- E. To the extent possible all sawdust shall be prevented from contacting beach, bed, or waters of the state. For example, sawdust on top of decking should be removed immediately after sawing operations.
- F. Any sawdust that enters the water shall be collected immediately and placed in the containment basin.
- G. Piles removed from the water shall be transferred to the containment basin without leaving the boomed area to prevent creosote from dripping outside of the boom.

#### **BMP 4. DISPOSAL OF PILING, SEDIMENT AND CONSTRUCTION RESIDUE**

- A. Piles shall be cut into lengths as required by the disposal company.
- B. Cut up piling, sediments, absorbent pads/boom, construction residue and plastic sheeting from containment basin shall be packed into container. For disposal, ship to an approved Subtitle D Landfill.
- C. Creosote-treated materials shall not be re-used.

#### **BMP 5. RESUSPENSION/TURBIDITY**

- A. Crane operator shall be trained to remove pile from sediment slowly.
- B. Work shall be done in low water and low current, to the extent possible.
- C. Removed piles shall be placed in a containment facility.
- D. Sediments spilled on work surfaces shall be contained and disposed of with the pile debris at permitted upland disposal site.
- E. Holes remaining after piling removal shall not be filled.

#### **BMP 6. PROJECT OVERSIGHT**

- A. WADNR will have a project manager or other assigned personnel on site. Oversight responsibilities may include, but are not limited to the following:
  - 1) Water quality monitoring to ensure turbidity levels remain within required parameters
  - 2) Ensure contractor follows BMPs
  - 3) Ensure contractor is in compliance with contract and permit requirements
  - 4) Ensure correct structures are removed
  - 5) Maintain contact with regulatory agencies should issues or emergencies arise

#### **BMP 7. CULTURAL RESOURCES**

- A. In the event that artifacts (other than the pilings or materials attached to them) that appear to be 50 years old or older are found during the project, the WADNR Aquatics archaeologist must be notified in order to evaluate the find and arrange for any necessary consultation and mitigation required by law.
- B. If human remains or suspected human remains are found during the project, work in the vicinity will be halted immediately, and the County Coroner must be notified immediately. If

the remains are determined to be non-forensic, then the WADNR Aquatics archaeologist will be notified to begin tribal and Washington State Department of Archaeology and Historic Preservation consultations required by law.

- C. If sediment exceeding 1 cubic meter is removed, the WADNR Aquatics archaeologist will be notified and given the opportunity to examine the sediment for cultural materials before it is removed from the containment area.