DRAINAGE MAINTENANCE PLAN - HPA PROVISIONS

MANAGED WATERCOURSE WITH HEADWATERS (Green)

GENERAL

1. Drainage maintenance activities shall only occur with the equipment operated from the top of the channel bank.

2. Equipment shall not enter or cross the channel when water is present.

3. Existing vegetation shall be retained on the sidewalls of the channel to the maximum extent possible.

4. Disturbance of the channel banks and woody stem riparian vegetation shall be held to an absolute minimum necessary to access the channel and to conduct the drainage maintenance activity.

5. Disturbance of woody stem riparian vegetation shall be limited to one side of the channel at any given location along the watercourse.

6. Disturbed soils along the shoreline at risk of entering the watercourse shall be protected from erosion using vegetation and/or other means.

7. Dredged, excavated, or bucket mowed materials shall be deposited landward of the top of the channel bank.

8. Dredged, excavated, or bucket mowed materials shall not be stockpiled below the top of the channel bank.

9. Project activities shall be conducted to minimize the introduction of silt-laden water into the watercourse.

10. Piling or lumber treated with creosote or pentchlorophenol shall not be used for project construction.

11. All treated wood shall be professionally treated and completely cured prior to installation below the high water line to minimize leaching into the water or substrate.

12. Wet concrete shall be prevented from entering the watercourse. Footings, foundations and/or super structures constructed with fresh concrete shall be sufficiently cured prior to contact with water to avoid leaching. Forms and impervious materials shall remain in place until the concrete is cured.

DRAINAGE MAINTENANCE PLAN - HPA PROVISIONS

MANAGED WATERCOURSE WITH HEADWATERS (Green)

GENERAL *(continued)*

13. All debris or deleterious material resulting from drainage maintenance activities shall be removed from the watercourse and prevented from re-entering the channel.

14. No petroleum products or other deleterious materials shall be allowed to enter the surface waters in the channel.

15. If a fish kill occurs or fish are observed in distress, in-water drainage maintenance activities shall immediately cease and the Area Habitat Biologist listed below shall be immediately contacted.

16. Removal of trash and plant debris blocking culverts, bridges, trash racks, pump facilities, and floodgates shall not be subject to a timing limitation.

17. Whenever rock is used to armor the channel bank in the immediate vicinity of a drainage structure (culvert, floodgate, bridge, pump facility), the rock shall be composed of clean, angular material of a sufficient durability and size to prevent its being broken up or washed away by high water.

18. The footprint of a maintained, repaired or replaced drainage structure (culvert, floodgate, bridge, pump facility, trash rack) below the high waterline shall not exceed the footprint of the original drainage structure below the high waterline.

MAINTENANCE DREDGING

1. Timing Limitations: Whenever water is present in the channel, maintenance dredging below the waterline shall only occur from August 1 through October 15 of any year for the protection of migrating juvenile and adult salmon.

2. NOTIFICATION REQUIREMENT: A representative of the Drainage District or the contractor shall notify the Area Habitat Biologist (AHB) listed below of the project start date. Notification shall be received by the AHB prior to the start of dredging activities.

3. Dredging shall be conducted with a dragline, excavator, and/or hand tools.

4. Each pass with the dragline or excavator bucket in the channel shall be complete.

DRAINAGE MAINTENANCE PLAN - HPA PROVISIONS

MANAGED WATERCOURSE WITH HEADWATERS (Green)

MAINTENANCE DREDGING *(continued)*

5. Dredging shall be held to the absolute minimum necessary to achieve the target channel width, depth and gradient.

6. The channel banks shall be sloped such that the resulting channel banks are stable.

7. Maintenance dredging shall not straighten or shorten the existing channel alignment.

8. Existing large woody material embedded in the channel bank or streambed shall be left undisturbed and intact.

Silt Management

9. When water is present in the channel, maintenance dredging activities in and immediately upstream of a watercourse reach that has been identified as juvenile salmonid rearing habitat in the Drainage District's Drainage Maintenance Plan shall implement silt management provisions 10 through 14.

10. Prior to initiating maintenance dredging activities, a temporary silt fence shall be installed immediately downstream of the watercourse reach to be dredged. The temporary silt fence shall be installed across the watercourse and perpendicular to the water flow.

11. The temporary silt fence shall remain in place for the duration of the maintenance dredging activity.

12. If watercourse flows are encountered that exceed the design capacity of the silt fence, the maintenance dredging activity shall stop until the watercourse flows subside.

13. Prior to the removal of the temporary silt fence from the watercourse, silt that has accumulated behind the silt fence shall be removed to the greatest extent possible.

14. The temporary silt fence shall be removed within 2 days of completing the maintenance dredging activity.

DRAINAGE MAINTENANCE PLAN – HPA PROVISIONS

MANAGED WATERCOURSE WITH HEADWATERS (Green)

MAINTENANCE DREDGING *(continued)*

Salmonid Removal

15. When water is present in the channel, the Salmonid Removal Assistance provisions on page 9 and 10 shall be implemented prior to initiating maintenance dredging activities in watercourse reaches that have been identified as juvenile salmonid rearing habitat in the Drainage District's Drainage Maintenance Plan.

CULVERT MAINTENANCE, REPAIR AND REPLACEMENT

1. Timing Limitations: When water is present in the channel, culvert maintenance below the waterline shall only occur from August 1 through October 15 of any year for the protection of migrating juvenile and adult salmon.

2. The damaged culvert and associated fill shall be removed from the watercourse and deposited upland so that it cannot re-enter the watercourse.

3. The culvert shall be placed on a flat gradient with the bottom of the culvert placed below the level of the streambed a minimum of 20 percent of the culvert diameter for a round culvert, and 20 percent of the culvert's rise for an elliptical culvert. The 20 percent placement below the streambed shall be measured at the culvert outlet.

4. The culvert shall be constructed to pass the 100-year peak flow with consideration of the debris likely to be encountered.

5. The culvert shall be maintained free of debris to ensure unimpeded drainage and fish passage.

6. Fill associated with the culvert installation and approach material shall be structurally stable and shall be composed of material that, if eroded into the watercourse, shall not be detrimental to fish life.

7. Fill associated with the culvert installation and approach material shall be protected from erosion to the 100-year peak flow.

DRAINAGE MAINTENANCE PLAN – HPA PROVISIONS

MANAGED WATERCOURSE WITH HEADWATERS (Green)

CULVERT MAINTENANCE, REPAIR AND REPLACEMENT *(continued)*

8. If an existing culvert is replaced by a bridge structure, then the existing culvert and associated fill shall be completely removed from the watercourse and the new bridge shall be subject to the bridge provisions of this HPA.

Cofferdam and Water Bypass

9. When water is present in the channel, the Cofferdam and Water Bypass provisions on page 7 shall be implemented prior to initiating culvert replacement activities in or immediately upstream of a watercourse reach that has been identified as juvenile salmonid rearing habitat in the Drainage District's Drainage Maintenance Plan.

Salmonid Removal

10. When water is present in the channel, the Salmonid Removal Assistance provisions on page 9 and 10 shall be implemented prior to initiating culvert replacement activities in watercourse reaches that have been identified as juvenile salmonid rearing habitat in the Drainage District's Drainage Maintenance Plan.

BRIDGE MAINTENANCE, REPAIR AND REPLACEMENT

1. Timing Limitations: When water is present in the channel, the bridge maintenance below the waterline shall only occur from August 1 through October 15 of any year for the protection of migrating juvenile and adult salmon.

2. The damaged bridge elements shall be removed from within the banks of the watercourse and deposited upland so that they cannot re-enter the watercourse.

3. New bridge footings or foundations shall be constructed landward of the channel high waterline at the project site.

4. Excavation for the bridge footings or foundations shall only occur landward of the high waterline of the watercourse.

5. Excavation for the bridge footings or foundations shall only occur landward of the waterline.

6. The bridge shall be constructed to pass the 100-year peak flow with consideration for debris likely to be encountered.

MANAGED WATERCOURSE WITH HEADWATERS (Green)

BRIDGE MAINTENANCE, REPAIR AND REPLACEMENT *(continued)*

7. Fill associated with the bridge or water crossing structure installation shall be protected from erosion to the 100-year peak flow.

8. Armoring of the channel banks to protect the bridge footings or foundations with rock materials shall be limited to the bank area immediately under the footprint of the bridge.

9. Approach material for the bridge shall be structurally stable and be composed of material that, if eroded into the watercourse, shall not be detrimental to fish life.

TRASH RACK MAINTENANCE, REPAIR AND REPLACEMENT

1. Timing Limitations: When water is present in the channel, structural maintenance of the trash rack below the waterline shall only occur from August 1through October 15 of any year for the protection of migrating juvenile and adult salmon.

2. The damaged elements of the trash rack shall be removed from the watercourse and deposited upland so that it cannot re-enter the watercourse.

3. When a trash rack is replaced, the vertical bars shall have a minimum spacing of 5 inches.

4. The trash rack shall be constructed to maintain structural integrity to the 100-year peak flow with consideration of the debris likely to be encountered.

PUMP FACILITY MAINTENANCE, REPAIR AND REPLACEMENT

1. Timing Limitations: When water is present in the channel, pump facility maintenance below the water line shall only occur from August 1through October 15 of any year for the protection of migrating juvenile and adult salmon.

2. The damaged elements of the pump facility shall be removed from the watercourse and deposited upland so that it cannot re-enter the watercourse.

3. The pump facility shall be constructed to maintain structural integrity to the 100-year peak flow with consideration of the debris likely to be encountered.

MANAGED WATERCOURSE WITH HEADWATERS (Green)

PUMP FACILITY MAINTENANCE, REPAIR AND REPLACEMENT *(continued)*

4. The pump facility intake shall: 1) be enclosed with screen material where the narrow dimension of the rectangular slots or mesh does not exceed .25 inch to prevent juvenile fish from entering the pump system; 2) the screened area shall have enough surface area to ensure that the water velocity through the screen dose not trap juvenile salmonids on the screen surface. A screen shall remain in place whenever water is withdrawn from the watercourse through the pump intake unless otherwise approved by WDFW per the following provision: In the event established screen criteria cannot be met, the Drainage Maintenance Plan shall identify an alternative technology that meets or exceeds these criteria and will identify a mutually acceptable strategy and timeline for implementation.

FLOODGATE MAINTENANCE, REPAIR AND REPLACEMENT

1. Timing Limitations: When water is present in the channel, floodgate maintenance below the waterline shall only occur from August 1through October 15 of any year for the protection of migrating juvenile and adult salmon.

2. The floodgate shall be replaced in the same location and configuration as the existing damaged floodgate.

3. The damaged elements of the floodgate shall be removed from the watercourse and deposited upland so that it cannot re-enter the watercourse.

4. The floodgate shall be constructed to pass the 100-year peak flow with consideration of the debris likely to be encountered.

5. Fill associated with the floodgate shall be protected from erosion to the 100-year peak flow.

6. Backfill material for the floodgate shall be structurally stable and be composed of material that, if eroded into the watercourse, shall not be detrimental to fish life.

7. If a rock outfall splash pad is constructed, the footprint of a rock outfall splash pad shall be held to an absolute minimum, shall not exceed 3 times the floodgate pipe diameter in width and shall not extend more than 3 feet waterward of the end of the floodgate.

MANAGED WATERCOURSE WITH HEADWATERS (Green)

FLOODGATE MAINTENANCE, REPAIR AND REPLACEMENT *(continued)*

Cofferdam and Water Bypass

8. When water is present in the channel, the Cofferdam and Water Bypass provisions on page 8-9 shall be implemented prior to initiating floodgate replacement activities in or immediately upstream of a watercourse reach that has been identified as juvenile salmonid rearing habitat in the Drainage District's Drainage Maintenance Plan.

MAINTENANCE CHANNEL IN-WATER BUCKET MOWING

1. Timing Limitations: When water is present in the channel, maintenance channel in-water bucket mowing shall only occur from August 1through October 15 of any year for the protection of migrating juvenile and adult salmon.

2. Maintenance channel in-water bucket mowing shall be conducted with mowing equipment identified in the District's Drainage Maintenance Plan.

3. Maintenance mowing shall only remove the plant materials from the channel. Maintenance mowing shall not alter the channel bed profile or the slope of the channel banks.

4. Large woody material embedded in the bank or streambed shall be left undisturbed and intact.

MAINTENANCE OUT-OF-WATER CHANNEL MOWING

1. Channel out-of-water mowing of woody stem riparian vegetation shall be limited to the banks of the watercourse necessary for equipment access to the channel as identified in the District's Drainage Maintenance Plan.

COFFERDAM AND WATER BYPASS

1. A temporary cofferdam shall be installed upstream and downstream of a culvert or floodgate replacement project site prior to initiating the culvert or floodgate replacement activities in order to isolate the project site from the watercourse.

MANAGED WATERCOURSE WITH HEADWATERS (Green)

Cofferdam and Water Bypass *(continued)*

2. For higher velocity flows or wider channels, the cofferdams dams shall be constructed of sandbags or sheet piles. For lower flows and narrower channels, cofferdams shall be constructed of earth plugs, straw bales or impermeable fabric fences. If impermeable fences are used, they shall be installed with sufficient subsurface footing to seal the watercourse.

3. Wastewater removed from within the work area shall be routed to an area landward of the top of the channel bank to allow removal of fine sediment and other contaminants prior to being discharged to the stream.

4. If water flow is present in the channel, the upstream cofferdam shall be installed with a bypass inlet that diverts the entire channel flow through the bypass pipe.

5. The bypass pipe shall be of sufficient size to pass all flows and debris for the duration of the project.

6. If a pump is used to divert water around the project area, the pump intake shall be enclosed with a screen material where the narrow dimension of the rectangular slots or mesh does not exceed .25 inch to prevent juvenile fish from entering the pump system. The screened area shall have enough surface area to ensure that the velocity through the screen does not trap fish on the screen surface. The screen shall remain in place whenever water is withdrawn from the watercourse through the pump intake.

7. Upon completion of the project, all material used to construct the cofferdams and the bypass shall be removed from the site and the site returned to pre-project or improved conditions.

SALMONID REMOVAL ASSISTANCE

1. At least 10 working days prior to initiating a maintenance dredging project, a Drainage District representative shall contact WDFW in writing to request salmonid removal assistance for the watercourse reach to be dredged.

2. At least 5 working days prior to initiating a culvert replacement or floodgate replacement project, a Drainage District representative shall contact WDFW in writing to request salmonid removal assistance for the project area that has been isolated from the rest of the watercourse by cofferdams.

MANAGED WATERCOURSE WITH HEADWATERS (Green)

SALMONID REMOVAL ASSISTANCE *(continued)*

3. The Drainage District shall not initiate maintenance dredging for 10 days following WDFW's receipt of the Drainage District's written request to allow sufficient time for salmonids to be removed from the watercourse reach to be dredged.

4. The Drainage District shall not initiate culvert or floodgate replacement for 5 days following WDFW's receipt of the Drainage District's written request to allow sufficient time for salmonids to be removed from the culvert or floodgate project site.

5. If watercourse flows are encountered that exceed the design capacity of the block nets used to prevent juvenile salmonids from re-entering the watercourse reach to be dredged, dredging activity shall stop until the watercourse flows subside.