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August 18, 2011

Ben Nelson
ACF West
Woodinville Corporate Center II, Bldg A #400
15540 Woodinville-Redmond Road
Woodinville, WA 98072

RE: ACF West Wheel-wash Functionally Equivalent (BMP C106)

Dear Mr. Nelson

The Washington State Department of Ecology (Ecology) finds the ACF West Wheel-wash system is functionally equivalent to BMP C106 Wheel Wash.

The ACF West system must adhere to the guidelines in the enclosed specifications.

Contractors may use the ACF West system at project sites without seeking additional Ecology approval, though Ecology cannot endorse this product or its manufacturer.

For more information, please contact me at (360) 407-6444, or email at douglas.howie@ecy.wa.gov.

Sincerely

Douglas C. Howie, P.E.
Program Development Services
Water Quality Program

Enclosure

cc: Kurt Marx, TAPE Technical Lead, Washington Stormwater Center

BMP C-106 Functional Equal: Neptune Wheel Wash Systems

Purpose: Wheel washes reduce the amount of sediment transported onto paved roads by motor vehicles.

Conditions of use:

When a stabilized construction entrance (BMP C-105) is not preventing tracking of sediment onto a paved surface.

Description: Neptune wheel wash systems are available in four (4) basic configurations: Neptune Compact, Maximus I, Maximus II, and Maximus III. The Compact and the Maximus I have a single tire revolution length of spray deck area, twelve (12) feet length. The Maximus II has two (2) full tire revolutions of spray deck area, twenty-four (24) feet length. The Maximus III has three (3) full tire revolutions of spray deck, thirty-three and a half (33.5) feet length. Size the length of the spray deck (type of wheel wash) appropriately to the type of soil and the amount of soil adhering to vehicles as they depart from the site. Neptune recommends the following size spray deck:

- Single tire spray decks for soils with low to moderate cohesion (sand or silty-sand soils) and a low to moderate soil load on departing vehicles.
- Two tire revolution spray decks for moderately cohesive soils (silt and silt with some clay content) and moderate to high soil load.
- Three tire revolution spray decks for moderate to cohesive soils (silt with high clay content and clay soils) and high soil load.

The Neptune Compact has an integral 2,500-gallon reservoir tank located directly beneath the spray deck, the Neptune Maximus series wheel wash units have varying size water recycling/separation tanks: 5,000 gallon, 7,500 gallon, and 10,000 gallon. Size the reservoir tank based on the number of expected vehicle passes on a daily basis and the amount of soils on the vehicles. Neptune recommends the following reservoir tank sizes:

- The 2,500 gallon Compact unit works well with a low truck (0-50) count and light soil conditions.
- 5,000-gallon tanks for 1- 50 passes per day coupled with a Maximus I spray unit.
- 7,500-gallon tanks for 51-120 passes per day.
- 10,000-gallon reservoirs for 120+ passes per day.

Reservoir Tanks equipped with auto scraper conveyor systems will allow heavier loads of soil and trucks per day with a constant removal of solids from tank.

Design and Installation Specifications:

Appendix A contains detailed specifications for the Neptune Compact, Maximus I, Maximus II, Maximus III, and Tracinator Appendix B contains suggested installation details.

Construct the approach to the wheel wash of clean quarry spalls or pavement. Keep the approach free of any accumulated sediments by sweeping, washing, or refreshing of quarry spalls. You can significantly improve the effectiveness of the wash systems by combining construction entrance rumble plates and/or Neptune Tracinator systems both before and after the wheel wash system. Additional actions to improve effectiveness include incorporating optional additional pumps and higher volume jets on the spray deck.

Wheel wash unit should be located in a position that will allow the longest expected vehicle to approach and exit the spray deck in a direct line. You can adjust the location of the reservoir tank with additional hose lengths to facilitate the area limitations posed by the site. You should verify the volume and pressure of wash water at spray deck if distance between the reservoir and spray deck exceeds 50 ft. To ensure proper function, additional pumps may be required.

The exit should be graded (see installation details, Appendix B) to allow any overspray and any water falling off washed vehicles to return to a collection sump, typically near the spray deck, where it can be returned to the reservoir by low volume sump pump.

Use licensed and qualified electricians to connect the power supply, (see Appendix A for power requirements). Consult with local regulatory agencies, and comply with all local codes, before energizing machine.

The length of time for each wash cycle (the time taken by a vehicle to pass through the spray deck) is very important to effective cleaning. Cycle time on the wheel wash is completely adjustable and should be set appropriately to allow the longest expected vehicle sufficient time on the wash deck to remove soils. Longer vehicles, more cohesive soils, and higher soil loads require longer cycle times. Instruct the vehicle operators to slow their vehicle to allow the required cycle time.

Use Dungeness Environmental ClearTrax 450 dry polymer flocculent to ensure the clarity of the wash water (see product data sheet and MSDS in Appendix C). Deliver the ClearTrax 450 into the wash water at a point of turbulence using a metered, adjustable auger system (see Appendix D for ClearTrax Hopper Auger specification and pictures). Adjust the amount of ClearTrax 450 metered into wash water to maintain an acceptable wash water clarity level, typically 20 – 100 NTU. The application rate of ClearTrax 450 required to maintain acceptable clarity will vary based on the soil type, soil load, and

reservoir size. Typical application rates for ClearTrax 450 are between 0.7 and 4.8 grams per min of cycle time (1.80 – 12.6 ppm in wash water).

Maintenance Standards:

Inspect the wheel wash system at the start of each workday for any damage and/or maintenance:

Inspect and top off the level of wash water in reservoir as required. If you have connected the reservoir fill port to a potable water source, be certain you installed the appropriate meter and backflow prevention check valve. Consult your local water supply department for details. If not connected to a water source, top off reservoir with water truck or other equipment. Potable water is not a requirement for proper operation of the wheel wash.

Wash water clarity should be inspected and the amount of ClearTrax 450 flocculent should be adjusted (+/-) as appropriate. Inspect and fill, if necessary, the Level of ClearTrax 450 in hopper/auger.

Inspect the spray to see that you have properly aimed all jets and free of any blockage.

Inspect recovery boxes, if used, and remove any excessive retained sediments (see "In ground installation" Appendix B). Inspect and adjust floating switches for recovery pumps as required.

"Power Present" should be verified by light on face of control panel. Conduct one test cycle to verify the correct operation of the system.

Collect settled sediment, removed from the reservoir by the automated scraper conveyor. Dispose of sediment in an appropriate manner, either on site or off site.

, Periodically inspect the wheel wash during operations to see that the system is continuing to function properly, vehicles are attaining a satisfactory level of cleaning, and water level is at a satisfactory level.

If vehicles exiting the wheel wash are retaining soils and trackout is occurring, try the following things to improve effectiveness:

- Increase the cycle time of the wash and instruct drivers to slow appropriately to utilize the full, longer cycle time.
- Remove any accumulated sediments from the approach to the wheel wash, install additional rumble plates and/or Neptune Tracinator.
- If vehicles continue to exhibit unsatisfactory cleaning levels, consider installing a longer (two or three tire revolution) spray deck such as the Maximus II or Maximus III.

It may become necessary to either to empty the reservoir tank at end of operations or to perform routine maintenance of tank and scraper conveyor.

Discharge wash water from the system to a separate onsite treatment system or to the sanitary sewer. Obtain proper approval from the local sewer district.

Link to appendices: http://acfwest.com/wheel-wash

Appendix A:

Neptune Compact Specifications, Maximus I Specifications, Maximus II Specifications, Maximus III Specifications, rumble plate example, Neptune Tracinator specifications.

Appendix B:

Installation schematics: Compact, Maximus I, II, & III.

Appendix C:

Dungeness ClearTrax 450 data sheet, ClearTrax 450 MSDS.

Appendix D:

Dungeness ClearTrax Hopper/Auger pictures.