



COLORADO

Department of Public
Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

September 17, 2015

Omar Gadalla, P.E.
Product Manager
Parkson Corporation
1401 West Cypress Creek Road
Fort Lauderdale, FL 33309

Subject: Acceptance of the Parkson DynaSand® Filter for Tertiary Filtration as an Alternative Technology for Use in Domestic Wastewater Treatment Works in Colorado

Dear Mr. Gadalla:

The Water Quality Control Division (the Division) has received and reviewed information for the Parkson DynaSand® filter in accordance with section 1.8.0 of *Design Criteria for Domestic Wastewater Treatment Works Policy WPC-DR-1* (wastewater design criteria). The Parkson DynaSand® filter design is accepted for use as an alternative technology subject to the design criteria in Table 1. This acceptance is not intended as a third-party certification of the technology.

This acceptance addresses the following:

- DynaSand® standard filter providing continuous, upflow, sand media filter with continuous backwashing.
- DynaSand® EcoWash™ filter providing continuous, upflow, sand media filter with intermittent backwashing based on timed/programmable sand circulation/backwashing to reduce reject water volume.

This acceptance applies only to the Parkson DynaSand® filter using standard continuous backwashing or EcoWash™ intermittent backwashing and does not constitute construction approval for installation in domestic wastewater treatment facilities. **Review and approval for the design of any domestic wastewater facility proposing to use this technology will be further reviewed on a site-specific basis by the Division** as required by Section 22.11(1) of the *Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works 5CCR 1002-22* (Regulation 22) and the Colorado Water Quality Control Act (Act), Section 25-8-702, C.R.S. which states in part that: “No person shall commence the construction of any domestic wastewater treatment works or the enlargement of the capacity of an existing domestic wastewater treatment works, unless the site location and the design for the construction or expansion have been approved by the division.”

Any modifications to the physical attributes or characteristics of this treatment technology must be submitted to this office for review and acceptance by the Division prior to sale in Colorado. This condition includes changes made to the Parkson DynaSand® filter (e.g., filter media, piping, mechanisms). For any changes to the process or equipment following the issuance of this letter, the Division will review any additional third party verification reports and issue a revised acceptance letter, or denial, as appropriate.



Table 1. Parkson DynaSand® Design Criteria:

Design Criteria
<ol style="list-style-type: none">1. Design loading rate shall not exceed an instantaneous flow rate of 5 gpm/SF. Pretreatment shall be incorporated into the design, as required, to account for and minimize the impacts of periodic influent loadings from side-stream processes. Flow equalization may be used to meet design loading rates.2. DynaSand® filters shall have at least 40 inches of sand depth (top of cone to top of sand) or the loading rate shall be reduced. Addition of chemical coagulant may be used to enhance filtration. Coagulants must be identified in permit application before use.3. Acceptance of the DynaSand® filters is primarily intended for filtering secondary clarifier quality effluent. Pretreatment processes shall be incorporated into the site-specific process train, as required, to ensure that the turbidity of the influent to the sand filter does not exceed 10 NTU, approximately 27 mg/L TSS, more than five percent of the time within a 24-hour period and never exceeds 15 NTU, approximately 40 mg/L TSS.4. Design for existing facilities shall include testing or analysis (e.g., filter influent TSS, particle size analysis, anticipated loading, lab tests, bench tests, and/or pilot testing) performed to evaluate filter effectiveness and the need for pretreatment for the expected wastewater characteristics. Design for new facilities shall include similar evaluation of anticipated performance of upstream processes to evaluate filter effectiveness and the need for pretreatment for the expected wastewater characteristics.5. Airlift Pump Equipment. The DynaSand® filters require adequate air capacity to operate the airlift pumps. Compressor capacity shall be able to provide a minimum of 3 scfm per module (50 SF) at 30 psig at the compressor. Compressors shall provide the full capacity with largest unit out of service. The design must demonstrate adequate size and capacity based on site-specific conditions and treatment requirements including, but not limited to, elevation, temperature (e.g., seasonal, air, wastewater), pipe sizes, bends, etc. Adequate air dryer capability shall be included (e.g., refrigerated type if indoor, desiccant type if outdoor).6. For facilities where ambient temperatures can be below freezing, the filter unit design shall include adequate cold weather provisions such as heat trace lines and/or installation in a temperature-controlled enclosure.7. The design must include alarm signals for emergency overflow/bypass conditions at a minimum. EcoWash™ units must also include online instantaneous monitoring (e.g., sand wash, valve close failure). The design must identify how the DynaSand® alarm signals will notify operators of alarm activations, when the facility is attended and unattended.8. The design must indicate where and how both the backwash reject water and the emergency bypass is redirected (e.g., to headworks, clarifier, by pipe, channel, pump).9. Design Redundancy: Filter installations shall have at least two DynaSand® filter cells (multiple modules in a cell) installed for facilities with design capacity equal to or greater than 40,000 gpd when filters are necessary to meet effluent limits. Where two cells are proposed, each unit shall have a design flow of at least 50 percent of the total design flow. Filters and appurtenances shall have the ability to handle the peak wastewater flow (hydraulic capacity, not treatment capacity) without overflow with the largest cell out of service. If a single filter cell is used, the installation shall include pumps and compressors providing full capacity with the largest pump and compressor unit out of service. In addition, an emergency operation plan (e.g., equipment, procedures, emergency storage, hauling) must be provided to maintain operation during operational impairment, such as power failures, flooding, peak loads, equipment failure, and maintenance shutdowns (e.g., media

addition or replacement). If multiple filter cells are used, installations shall have at least two pumps and compressors capable of being interconnected to each filter cell (i.e., either installed or available at the site).

10. If multiple filters are to be operated in parallel, adequate flow splitting devices must be provided to ensure appropriate flow to each unit.
11. Maintenance Access. Design shall include provisions that allow the operator to access, operate, and maintain the treatment technology.
12. Manufacturer Review. A review letter issued by the manufacturer indicating the installation was designed in accordance with manufacturer recommendations must be included with the site-specific design submittal. The manufacturer's review may not supersede criteria in this acceptance. The manufacturer's review may not be substituted for all required engineering documentation and calculations stamped and signed by a Colorado licensed Professional Engineer.

Additional Operations and Maintenance Criteria

1. Design shall include provision for operator training including, but not limited to: start-up operations, normal operations, hydraulic fluctuations, sand media monitoring and replacement, and residual management.
2. An Operations and Maintenance (O&M) Manual shall be provided for all installations and be available for review by the Division during compliance inspections.
3. Individual operations plans shall include scheduled inspections, assessments, and maintenance of the filters, influent and effluent header channels or pipes, reject flow channels or pipes, and sand media condition as an operational safeguard. This plan for scheduled inspections and assessments should include a routine inspection at least annually.

The owner of the domestic wastewater treatment works is responsible for proper design, operation, and maintenance of the facility to meet permit effluent requirements.

Please be aware that any point source discharges of water from treatment facilities are potentially subject to a discharge permit under Colorado's State Discharge Permit System. Any point source discharges to state waters without a permit are subject to civil or criminal enforcement action.

As part of this review, the Division has evaluated the following documents:

- April 2015 Submittal from Parkson Corporation requesting alternative technology acceptance for DynaSand® filters.
- August 26, 2015 Submittal from Parkson Corporation providing additional information for the alternative technology review for the DynaSand® filters.
- January 30, 2013 California Department of Public Health Conditional Acceptance of the Parkson DynaSand® EcoWash™ filter to Comply with California Water Recycling Criteria.
- December 1, 1986 California Department of Health Services Conditional Acceptance of the Parkson DynaSand® filter to meet Wastewater Reclamation Criteria for filtered wastewater.

Please direct any further correspondence regarding this acceptance to:

David Kurz, P.E.
Colorado Department of Public Health and Environment
Water Quality Control Division
4300 Cherry Creek Drive South
Denver, CO 80246

If you have any questions or comments, please contact David Kurz at david.kurz@state.co.us or 303-692-3552.

Sincerely,

David Kurz, P.E.
Lead Wastewater Engineer
Engineering Section
Water Quality Control Division
Colorado Department of Public Health and Environment

cc: CDPHE-WQCD-ES