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| Minnesota Pollution Control Agency (MPCA), 520 Lafayette Road North, St. Paul, MN 55155-4194 | Coarse Screen Review Checklist  NPDES/SDS Permit Program  National Pollutant Discharge Elimination System (NPDES)/ State Disposal System (SDS)  Doc Type: Plan/Specification Review Summary |

**Purpose:** This checklist is intended for use by design engineers, to assist Minnesota Pollution Control Agency (MPCA) review engineers in the efficient review of planning and design documents. The information requested is the minimum technical data necessary for MPCA staff to review proposed designs and to determine whether there is reasonable assurance that the treatment system, when constructed, will comply with permit conditions, regulations, and criteria of the MPCA.

**Instructions:** The information in this checklist is based on the ***Recommended Standards for Wastewater Facilities published by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (Ten State Standards) 2014 Edition,*** other accepted engineering references, and MPCA recommendations. Specific references, other than Ten State Standards, are listed where appropriate. The checklist is organized according to the numbering sequence found in Ten State Standards to allow for ease in locating the entire content and text of the recommendations.

The checklist is designed so that a “**yes**” answer indicates compliance with Ten State Standards et al.

A “**no**” answer indicates a deviation from Ten State Standards et al. Answering “no” to any question will require justification and possibly supporting information, from wastewater treatment plant operational data, to demonstrate how the intent of the recommendation will be met. Additional information may be requested based on site specific conditions.

A “**N/A**” answer means not applicable because the equipment associated with the question is not included in the design.

Wastewater Treatment Facility information

|  |  |  |  |
| --- | --- | --- | --- |
| **Date (mm/dd/yyyy):** |  | **MPCA Project No:** |  |
| **Title of Project:** |  | | |

Permittee information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Facility name: | |  | | |
| Contact name: | |  | NPDES/SDS Permit No: | MN |
| Email: |  | | Phone number: |  |

Design Engineer information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Contact name: | |  | Contact phone number: |  |
| Email: |  | |  |  |

**Phase:**  Planning Phase  Design Phase

Influent Characteristics

|  |  |  |
| --- | --- | --- |
|  | **gallons per minute, gpm** | **million gallons per day, mgd** |
| **Average Wet Weather (AWW) flow** |  |  |
| **Peak Hourly (PH) flow** |  |  |

61.1 Coarse screens

*(Only use a “N/A” answer if the equipment associated with the question is not included in the design)*

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| **61.11 Where required** | | | **Yes** | **No** |
| Are pumps and other equipment protected by the use of trash racks, coarse bar racks, or coarse screens? | | |  |  |
| Types of units: |  |  | | |
| Number of units: |  |  | | |
| Width of units: |  | inches | | |

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| **61.12 Design and installation** | | | | | | | | | |
| **61.121 Bar spacing** | | | | | **Yes** | **No** | | **N/A** | |
| Are clear openings between bars no less than 1 inch for manually cleaned screens? | | | | |  |  | |  | |
| Are clear openings between bars between 0.25 and 1.5 inches for mechanically cleaned screens? (MOP 8 1998) | | | | |  |  | |  | |
| Are maximum clear openings 1.75 inches? | | | | |  |  | |  | |
| **61.122 Slope and velocity** | | | | | | | | | |
| Are manually cleaned screens placed on a slope of 30 to 45 degrees from the horizontal? | | | | |  |  | |  | |
| Are mechanically cleaned screens placed on slope of 45 to 90 degrees from the horizontal? | | | | |  |  | |  | |
| At design average flow conditions, are approach velocities no less than 1.25 feet per second to prevent settling and no greater than 3.0 feet per second to prevent forcing material through the openings? Design average flow is the average of the daily volumes to be received for a continuous 12 month period expressed as a volume per unit time. | | | | |  |  | |  | |
| Flow through velocity at design average flow: | |  | | feet per second (ft/sec) | | | | | |
| Are approach velocities for manually cleaned screens between 1 ft/sec and 2 ft/sec? (MOP 8 1998 and M&E 2014) | | | | |  |  | |  | |
| Are the minimum velocities through mechanically cleaned screens between 1 ft/sec and 2 ft/sec and the maximum approach velocities between 2 ft/sec and 4 ft/sec? (MOP 8 1998) | | | | |  |  | |  | |
| Is the allowable headloss through a manually cleaned screen limited to 6 inches? (M&E 2014) | | | | |  |  | |  | |
| Is the allowable headloss through a mechanically cleaned screen between 6 and 24 inches? (M&E 2014) | | | | |  |  | |  | |
| **61.123 Channels** | | | | |  |  | |  | |
| Are dual channels provided and equipped with necessary gates to isolate flow from any screening unit? | | | | |  |  | |  | |
| Are provisions made to facilitate dewatering each unit? | | | | |  |  | |  | |
| Is the channel preceding and following the screen shaped to eliminate stranding and settling of solids? | | | | |  |  | |  | |
| **61.124 Auxiliary screens** | | | | | | | | |
| When a single mechanically cleaned screen is used, is an auxiliary manually cleaned screen provided? | | | | |  |  |  | |
| Where two or more mechanically cleaned screens are used, does the design provide for taking any unit out of service without sacrificing the capability to handle the design peak instantaneous flow? | | | | |  |  |  | |
| **61.125 Invert** | | | | |  |  |  | |
| Is the screen channel invert 3 to 6 inches below the invert of the incoming sewer? | | | | |  |  |  | |
| **61.126 Flow Distribution** | | | | |  |  |  | |
| Is the entrance channel designed to provide equal and uniform distribution to the screens? | | | | |  |  |  | |
| **61.127 Backwater effect on flow metering** | | | | |  |  |  | |
| Is the flow measurement device reliable and accurate and is it located so that it will not be influenced by the effect of changes in backwater elevation due to intermittent cleaning of screens? | | | | |  |  |  | |
| Type of flow measurement device: |  | | | | | | | | |
| **61.128 Freeze protection** | | | | |  |  |  | |
| Are screening devices and screening storage areas protected from freezing? | | | | |  |  |  | |
| **61.129 Screenings removal and disposal** | | | | |  |  |  | | |
| Is a convenient and adequate means for removing screenings provided? | | | | |  |  |  | | |
| Are screens manually or mechanically cleaned? | | |  | | | | | | |
| Are facilities provided for handling, storage, and disposal of screenings in a manner acceptable to the regulatory agency? | | | | |  |  |  | | |
| Final disposal location for screenings: | | |  | | | | | | |

|  |  |  |  |  |
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| ***61.129 Screenings removal and disposal (continued)*** | **Yes** | **No** | **N/A** | |
| Do manually cleaned screening facilities include an accessible platform where the operator can rake screenings easily and safely? |  |  |  | |
| Are suitable drainage facilities provided for both the platform and the screenings storage area? |  |  |  | |
| **61.13 Access and ventilation** | | | | |
| Is stairway access provided for screens that are located in pits more than 4 feet deep? Access ladders are acceptable for pits less than 4 feet deep, in lieu of stairways. |  |  |  | |
| Are screening devices isolated from the rest of the building when they are installed where other equipment or offices are located, with separate outside entrances and separate and independent fresh air supply? |  |  |  | |
| Will fresh air be forced into enclosed screening device areas or open pits that are more than 4 feet deep? |  |  |  | |
| Is the use of dampers or other obstructions avoided on exhaust or fresh air ducts and fine screens to prevent clogging? |  |  |  | |
| Are at least 12 complete air changes per hour provided where continuous ventilation is required? |  |  |  | |
| Where continuous ventilation would cause excessive heat loss, is intermittent ventilation of at least 30 complete are changes per hour provided when personnel enter the area? |  |  |  | |
| Are the air change requirements based on 100 percent fresh air? |  |  |  | |
| Are switches for operation of ventilation equipment marked and conveniently located? |  |  |  | |
| Is all intermittently operated ventilation equipment interconnected with the respective pit lighting system? |  |  |  | |
| Is the fan wheel fabricated from non-sparking material? |  |  |  | |
| Are explosion proof gas detectors provided in accordance with Section 57 of Ten State Standards? |  |  |  | |
| **61.14 Safety and shields** | | | | |
| **61.141 Railings and gratings** | | | | |
| Are manually cleaned screen channels protected by guard railings and deck grating, with adequate provisions for removal or opening to facilitate raking? |  |  |  | |
| Are mechanically cleaned screen channels protected by guard railings and deck grating? |  |  |  | |
| Was consideration given to temporary access arrangements to facilitate maintenance and repair? |  |  |  | |
| **61.142 Mechanical devices** | | | | |
| Does mechanical screening equipment have adequate removal enclosures to protect personnel against accidental contact with moving parts and to prevent dripping in multi-level installations? |  |  |  | |
| Is a positive means of locking out each mechanical device and temporary access for use during maintenance provided? |  |  |  | |
| **61.143 Drainage** | | | | |
| Is floor design and drainage provided to prevent slippery areas? |  |  |  | |
| **61.144 Lighting** |  |  |  | |
| Is suitable lighting provided in all work and access areas? Paragraph 61.152 of Ten State Standards can be used for reference. |  |  |  | |
| **61.15 Electrical equipment and control systems** | | | | |
| **61.151 Timing devices** | | | | |
| Are mechanical units that are operated by timing devices provided with auxiliary controls that will set the cleaning mechanism in operation at a preset high water elevation? |  |  | |  |
| If the cleaning mechanism fails to lower the high water, will a warning be signaled? |  |  | |  |
| **61.152 Electrical equipment, fixtures and controls** | | | | |
| Does the electrical equipment, fixtures and controls in the screening area where hazardous gases may accumulate meet the requirements of the National Electrical Code for Class I, Division I, Group D locations? |  |  | |  |
| **61.153 Manual override** | | | | |
| Are automatic controls supplemented by a manual override? |  |  | |  |

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| Justification for all questions answered with a “no”: |
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**References**

GLUMRB (2014 Edition) *Recommended Standards for Wastewater Facilities* (Ten State Standards), Health Research, Inc., Health Education Services Division, Albany NY.

WEF (1998) *Design of Municipal Wastewater Treatment Plants, Manual of Practice No. 8*, Water Environment Federation, Alexandria, VA. (MOP 8 1998)

Metcalf & Eddy, Inc. (2014) *Wastewater Engineering, Treatment and Resource Recovery*, 5th ed., McGraw-Hill, New York. (M&E 2014)