

From: [Knudson, Cheryl J.](#)
To: [McGill, Richard](#)
Cc: [Eastvold, Jonathan C.](#)
Subject: [External] RE: First Notice Documents from JCAR
Date: Wednesday, May 25, 2022 4:01:19 PM
Attachments: [35-604NT-P JCAR.docx](#)
[35-604RG-P r01 \(46-22\).docx](#)
[Redline - 35-604RG-P\(replacement\) Agency FOR DELTA and 35-604RG-P r01 \(46-22\).pdf](#)

First Notice documents are attached for your review:

- [Notice Page](#)
- **Ist Notice** – [Numbered Line Version](#)
- [Agency vs. JCAR r01](#)

If you have any questions or concerns, please contact Jonathan Eastvold @ 217-524-9010.

Thank you,
Cheryl

Cheryl Knudson
Joint Committee on Administrative Rules
Illinois General Assembly
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POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

- 1) Heading of the Part: Design, Operation and Maintenance Criteria
- 2) Code Citation: 35 Ill. Adm. Code 604
- 3)

<u>Section Numbers:</u>	<u>Proposed Actions:</u>
604.255	Amendment
604.315	Amendment
604.525	Amendment
604.605	Amendment
604.735	Amendment
604.805	Amendment
604.900	Amendment
604.1005	Amendment
604.1010	Amendment
604.1105	Amendment
604.1350	Amendment
604.1510	Amendment
604.1520	Repealed
- 4) Statutory Authority: Implementing Section 14-19 and authorized by Section 27 of the Illinois Environmental Protection Act [415 ILCS 5/14-19 and 27].
- 5) A Complete Description of the Subjects and Issues Involved: The rulemaking pertains to the Board's public water supply rules and contain the requirements necessary for owners and official custodians of public water supplies in the State to provide, "continuous operation and maintenance of public water supply facilities to assure that the water is safe in quality, clean, adequate in quantity, and of satisfactory mineral characteristics for ordinary domestic consumption." 35 Ill. Adm. Code 601.101(a). In this rulemaking, the Board proposes non-substantive amendments to remove redundant or unnecessary language, replace outdated language, update statutory references, and reorganize provisions for clarity. The rulemaking also proposes amendments to delete outdated provisions, appropriately match incorporations by reference, eliminate redundancies and correct citations.
- 6) Published studies or reports, and sources of underlying data, used to compose this rulemaking: No
- 7) Will this proposed rulemaking replace an emergency rule currently in effect? No
- 8) Does this rulemaking contain an automatic repeal date? No

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- 9) Does this proposed rulemaking contain incorporations by reference? No
- 10) Are there any proposed rulemakings to this Part pending? No
- 11) Statement of Statewide Policy Objectives: This proposed amendment does not create or enlarge a State mandate as defined in Section 3(b) of the State Mandates Act. [30 ILCS 805/3].
- 12) Time, Place, and Manner in which interested persons may comment on this proposed rulemaking: The Board will accept written public comments on this proposal for a period of at least 45 days after the date of publication in the *Illinois Register*. Public comments should refer to Docket R18-26 and be filed electronically through the Clerk's Office On-Line (COOL) on the Board's website at pcb.illinois.gov. Public comments may be addressed to:
- Clerk's Office
Illinois Pollution Control Board
100 W. Randolph St., Suite 11-500
Chicago, IL 60601
- Interested persons may download copies of the Board's opinions and orders in R18-26 from the Board's Web site at pcb.illinois.gov and may also request copies by calling the Clerk's office at 312-814-3620.
- 13) Initial Regulatory Flexibility Analysis:
- A) Types of small businesses, small municipalities and not for profit corporations affected: None
- B) Reporting, bookkeeping or other procedures required for compliance: The proposed amendments in this rulemaking will not themselves require recordkeeping or reporting procedures for compliance.
- C) Types of Professional skills necessary for compliance: None
- 14) Small Business Impact Analysis: The Board does not expect that the proposed rules will impact small business.
- 15) Regulatory Agenda on which this rulemaking was summarized: This rule did not appear

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NOTICE OF PROPOSED AMENDMENTS

in a regulatory agenda.

The full text of the Proposed Amendments begins on the next page:

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE F: PUBLIC WATER SUPPLIES
CHAPTER I: POLLUTION CONTROL BOARD

PART 604
DESIGN, OPERATION AND MAINTENANCE CRITERIA

SUBPART A: GENERAL PROVISIONS

10	Section	
11	604.100	Purpose
12	604.105	General Requirements
13	604.110	Location
14	604.115	Usage
15	604.120	Piping Identification
16	604.125	Automatic Equipment
17	604.130	Operational Testing Equipment
18	604.135	Repair Work and Emergency Operation
19	604.140	Nitrification Action Plan
20	604.145	Exceptions for Community Water Supplies
21	604.150	Protection of Community Water Supply Structures
22	604.155	Electrical Controls and Standby Power
23	604.160	Safety
24	604.165	Monthly Operating Report
25	604.170	Security

SUBPART B: SOURCE DEVELOPMENT

29	Section	
30	604.200	General Requirements
31	604.205	Surface Water Quantity
32	604.210	Surface Water Quality
33	604.215	Surface Water Structures
34	604.220	Invasive Mussel Control
35	604.225	Reservoirs
36	604.230	Groundwater Quantity
37	604.235	Groundwater Quality
38	604.240	General Well Construction
39	604.245	Well Testing and Records
40	604.250	Aquifer Types and Construction Methods
41	604.255	Well Pumps, Discharge Piping and Appurtenances

SUBPART C: SOURCE WATER PROTECTION PLAN

44
45 Section
46 604.300 Purpose
47 604.305 Source Water Protection Plan Requirement and Contents
48 604.310 Vision Statement
49 604.315 Source Water Assessment
50 604.320 Source Water Protection Plan Objectives
51 604.325 Action Plan
52 604.330 Submission
53 604.335 Agency Approval
54 604.340 Evaluation and Revision

55
56 SUBPART D: AERATION

57
58 Section
59 604.400 General Requirements for Aeration
60 604.405 Forced or Induced Draft Aeration
61 604.410 Spray Aeration
62 604.415 Pressure Aeration
63 604.420 Packed Tower Aeration
64 604.425 Other Methods of Aeration

65
66 SUBPART E: CLARIFICATION

67
68 Section
69 604.500 General Clarification Requirements
70 604.505 Coagulation
71 604.510 Flocculation
72 604.515 Sedimentation
73 604.520 Solids Contact Unit
74 604.525 Tube or Plate Settlers
75 604.530 Other High Rate Clarification Processes

76
77 SUBPART F: FILTRATION

78
79 Section
80 604.600 Filtration
81 604.605 Rapid Rate Gravity Filters
82 604.610 Rapid Rate Pressure Filters
83 604.615 Deep Bed Rapid Rate Gravity Filters
84 604.620 Biologically Active Filtration

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86 SUBPART G: DISINFECTION

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88	Section	
89	604.700	Disinfection Requirement
90	604.705	Chlorination Equipment
91	604.710	Points of Application
92	604.715	Contact Time
93	604.720	Inactivation of Pathogens
94	604.725	Residual Chlorine
95	604.730	Continuous Chlorine Analyzers
96	604.735	Chlorinator Piping
97		
98		SUBPART H: SOFTENING
99		
100	Section	
101	604.800	Lime or Lime-soda Process
102	604.805	Cation Exchange Process
103		
104		SUBPART I: STABILIZATION
105		
106	Section	
107	604.900	General Stabilization Requirements
108	604.905	Carbon Dioxide Addition
109	604.910	Phosphates
110	604.915	Split Treatment
111		
112		SUBPART J: OTHER TREATMENT
113		
114	Section	
115	604.1000	Presedimentation
116	604.1005	Anion Exchange
117	604.1010	Iron and Manganese Control
118	604.1015	Taste and Odor Control
119	604.1020	Powdered Activated Carbon
120		
121		SUBPART K: CHEMICAL APPLICATION
122		
123	Section	
124	604.1100	General Chemical Application Requirements
125	604.1105	Feed Equipment and Chemical Storage
126	604.1110	Protective Equipment
127	604.1115	Chlorine Gas
128	604.1120	Acids and Caustics
129	604.1125	Chlorine Dioxide

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130	604.1130	Sodium Chlorite
131	604.1135	Sodium Hypochlorite
132	604.1140	Ammonia
133	604.1145	Potassium Permanganate
134	604.1150	Fluoride

135

SUBPART L: PUMPING FACILITIES

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138 Section

139	604.1200	General
140	604.1205	Pumping Stations
141	604.1210	Pumps
142	604.1215	Booster Pumps
143	604.1220	Automatic and Remote-Controlled Stations
144	604.1225	Appurtenances

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SUBPART M: STORAGE

147

148 Section

149	604.1300	General Storage Requirements
150	604.1305	Overflow
151	604.1310	Access to Water Storage Structures
152	604.1315	Vents
153	604.1320	Level Controls
154	604.1325	Roof and Sidewalls
155	604.1330	Painting and Cathodic Protection
156	604.1335	Treatment Plant Storage
157	604.1340	Elevated Storage
158	604.1345	Hydropneumatic Storage
159	604.1350	Combination Pressure Tanks and Ground Storage

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SUBPART N: DISTRIBUTION

162

163 Section

164	604.1400	General Distribution System Requirements
165	604.1405	Installation of Water Mains
166	604.1410	Materials
167	604.1415	System Design
168	604.1420	Valves
169	604.1425	Hydrants
170	604.1430	Air Relief Valves
171	604.1435	Valve, Meter and Blow Off Chambers
172	604.1440	Sanitary Separation for Finished Water Mains

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- 173 604.1445 Sanitary Separation for Raw Water Mains
- 174 604.1450 Surface Water Crossings
- 175 604.1455 Water Service Line
- 176 604.1460 Water Loading Stations

177

SUBPART O: CROSS CONNECTIONS

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Section

- 181 604.1500 Cross Connections
- 182 604.1505 Cross Connection Control Program
- 183 604.1510 Cross Connection Control Device Inspectors
- 184 604.1515 Agency Approved Cross Connection Control Measures
- 185 604.1520 COVID-19 Emergency Provisions (Repealed)

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- 187 604.TABLE A Steel Pipe

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189 AUTHORITY: Implementing Section 14-19 and authorized by Section 27 of the Illinois
190 Environmental Protection Act [415 ILCS 5/14-19 and 27].

191

192 SOURCE: Adopted in R18-17 at 43 Ill. Reg. 8064, effective July 26, 2019; emergency
193 amendment in R20-20 at 44 Ill. Reg. 7777, effective April 17, 2020, for a maximum of 150 days;
194 amended in R20-21 at 44 Ill. Reg. 14736, effective August 27, 2020; amended in R18-25 at 46
195 Ill. Reg. _____, effective _____.

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SUBPART B: SOURCE DEVELOPMENT

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Section 604.255 Well Pumps, Discharge Piping and Appurtenances

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- 201 a) Where line shaft pumps are used:

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- 203 1) the casing must be firmly connected to the pump structure or have the
204 casing inserted into a recess extending at least one-half inch into the pump
205 base;

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- 207 2) the pump foundation and base must be at least six inches above the
208 finished floor elevation; and

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- 210 3) lubricants must comply with Section 604.105(f).

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- 212 b) Where a submersible pump is used:

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- 1) the top of the casing must be effectively sealed to prohibit the entrance of water under all conditions of vibration or movement of conductors or cables;
 - 2) the electrical cable must be firmly attached to the riser pipe at 20-foot intervals or less; and
 - 3) mercury seals must not be used when an existing submersible pump is replaced or a new submersible pump is installed.
- 224 c) Discharge Piping
- 225
- 1) The discharge piping for each well must:
 - 226 A) be designed to minimize friction loss;
 - 227
 - 228 B) be equipped with a check valve in or at the well, a shutoff valve, a
 - 229 pressure gauge, and a means of measuring flow;
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 - 231 C) be protected from the entrance of contamination;
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 - 233 D) have control valves and appurtenances located above the
 - 234 pumphouse floor when an above-ground discharge is provided;
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 - 236 E) be equipped with a smooth nosed sampling tap at least 18-inches
 - 237 above the floor to facilitate sample collection, located at a point
 - 238 where positive pressure is maintained, but before any treatment
 - 239 chemicals are applied;
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 - 241 F) when necessary to remove entrapped air from the well, be
 - 242 equipped with an air release-vacuum relief valve located upstream
 - 243 from the check valve, with exhaust/relief piping terminating in a
 - 244 down-turned position at least 18 inches above the floor and
 - 245 covered with a 24 mesh, corrosion resistant screen;
 - 246
 - 247 G) be valved to permit test pumping and control of each well;
 - 248
 - 249 H) have all exposed piping, valves and appurtenances protected
 - 250 against physical damage and freezing;
 - 251
 - 252 I) be anchored to prevent movement and be supported to prevent
 - 253 excessive bending forces;
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- 257 J) be protected against surge or water hammer; and
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259 K) be constructed so that it can be disconnected from the well or well
260 pump to allow the well pump to be pulled.
261
262 2) The well must have a means of pumping to waste that is not directly
263 connected to a sewer.
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265 3) The discharge, drop or column piping inside the well for submersible,
266 submersible jet and submersible line shaft pumps must:
267
268 A) be capable of supporting the weight of the submersible pump,
269 piping, water and appurtenances, and of withstanding the thrust,
270 torque, torque fatigue and other reaction loads created during
271 pumping; and
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273 B) use lubricants, fittings, brackets, tape or other appurtenances that
274 comply with Section 604.105(f).
275
276 d) Pitless Well Units
277
278 1) Pitless units must:
279
280 A) be shop-fabricated from the point of connection with the well
281 casing to the unit cap or cover;
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283 B) be threaded or welded to the well casing;
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285 C) be of watertight construction throughout;
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287 D) be of materials and weight at least equivalent and compatible to the
288 casing;
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290 E) have field connection to the lateral discharge from the pitless unit
291 of threaded, flanged or mechanical joint connection; and
292
293 F) terminate at least 18 inches above final ground elevation or three
294 feet above the 100-year flood level or the highest known flood
295 elevation, whichever is higher.
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297 2) The design of the pitless unit must make provision for:
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299 A) access to disinfect the well;

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- B) a properly constructed casing vent meeting the requirements of subsection (e);
 - C) facilities to measure water levels in the well, under subsection (f);
 - D) a cover at the upper terminal of the well that will prevent the entrance of contamination;
 - E) a contamination-proof entrance connection for electrical cable;
 - F) an inside diameter as great as that of the well casing to facilitate work and repair on the well, pump, or well screen; and
 - G) at least one check valve within the well casing.
- 3) If the connection to the casing is by field weld, the shop-assembled unit must be designed specifically for field welding to the casing. The only field welding permitted will be that needed to connect a pitless unit to the casing.
- e) Casing Vent
- 1) Well casing must be vented to the atmosphere.
 - 2) The vent must terminate in a downturned position, at or above the top of the casing or pitless unit, no less than 12 inches above grade or floor, in a minimum 1½ inch diameter opening covered with a 24 mesh, corrosion resistant screen.
 - 3) The pipe connecting the casing to the vent must be of adequate size to provide rapid venting of the casing.
 - 4) Where vertical turbine pumps are used, vents may be placed into the side of the casing.
- f) Water Level Measurement
- 1) Each well must be equipped with a means for taking water level measurements.

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341 2) Where pneumatic water level measuring equipment is used, it must be
342 made using corrosion-resistant materials attached firmly to the drop pipe
343 or pump column to prevent entrance of foreign materials.
344

345 g) Observation wells must meet the requirements in 77 Ill. Adm. Code 920.170.
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347 (Source: Amended at 46 Ill. Reg. _____, effective _____)
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SUBPART C: SOURCE WATER PROTECTION PLAN

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Section 604.315 Source Water Assessment

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351 a) The source water assessment must contain the following information:
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354 1) statement of the importance of the source water;
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357 2) a list of water supplies that obtain water from this community water
358 supply;
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361 3) delineation of all sources of water used by the community water supply,
362 including:

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364 A) for surface water, description of the watershed, map of the
365 watershed, and intake locations;

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367 B) for groundwater, the well identification number, well description,
368 well status and well depth; a description of setback zones; and a
369 description of the aquifer for each well;

370

371 4) a report on the quality of the source water for all sources of water
372 delineated in subsection (a)(3), including:

373

374 A) when and where samples used to determine the quality of the
375 source water were taken. These samples must be tested by a
376 certified laboratory; and

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378 B) the certified laboratory's results;

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380 5) a report on the quality of the finished water;

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382 6) identification of potential sources of contamination to the source water;

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383 7) analysis of the source water's susceptibility to contamination; and

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- 8) explanation of the community water supply's efforts to protect its source water.
- b) Upon request, the Agency will provide technical assistance to a community water supply in conducting the source water assessment.
- c) A community water supply may use a Source Water Assessment Program Fact Sheet prepared by the Agency to fulfill the requirements of this Section.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART E: CLARIFICATION

Section 604.525 Tube or Plate Settlers

- a) Settler units consisting of variously shaped tubes or plates installed in multiple layers and at an angle to the flow may be used for sedimentation, following flocculation.
- b) Tube or plate settlers must meet the following requirements:
 - 1) Inlet and outlet design must maintain velocities suitable for settling in the basin and to minimize short-circuiting;
 - 2) Plate units must be designed to minimize maldistribution across the units;
 - 3) Drain piping from settler units must be sized to facilitate a quick flush of the settlers units and to prevent flooding of other portions of the plant;
 - 4) Outdoor installations must be protected against freezing, including sufficient freeboard above the top of the settlers;
 - 5) Tubes must have a maximum application rate of 2 gpm per square foot of cross-sectional area, unless higher rates are shown through pilot plant or in-plant demonstration studies;
 - 6) Plates must have a maximum application rate of 0.5 gpm per square foot, based on 80 percent of the projected horizontal plate area;
 - 7) Flushing lines must be provided to facilitate maintenance and must be properly protected against backflow or back siphonage;

- 427 8) Inlets and outlets must conform with Section 604.515(b) and (d);
- 428
- 429 9) The units' support system must be able to carry the weight of the settler
- 430 units when the basin is drained plus any additional weight to support
- 431 maintenance; and
- 432
- 433 10) Settler units must accommodate:
- 434
- 435 A) A water or air jet system for cleaning their tubes or plates; and
- 436
- 437 B) Dropping their water level to allow cleaning with the system
- 438 identified in subsection (b)(10)(A).
- 439

440 (Source: Amended at 46 Ill. Reg. _____, effective _____)

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442 **SUBPART F: FILTRATION**

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444 **Section 604.605 Rapid Rate Gravity Filters**

- 445
- 446 a) The use of rapid rate gravity filters requires pretreatment.
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- 448 b) For community water supplies treating surface water, groundwater under the
- 449 direct influence of surface water, or using lime soda softening treatment, unless
- 450 otherwise approved by the Agency under Section 604.145(b), the nominal
- 451 filtration rates must not exceed 3 gal/min/ft² of filter area for single media filters
- 452 and 5 gal/min/ft² for multi-media filters. Filtration rates must be reduced when
- 453 treated water turbidity exceeds the standards in 35 Ill. Adm. Code 611.
- 454
- 455 c) For community water supplies treating groundwater and not using lime soda
- 456 softening treatment, unless otherwise approved by the Agency under Section
- 457 604.145(b), the rate of filtration must not exceed 4 gal/min/ft² of filter area.
- 458
- 459 d) Number of Filter Units:
- 460
- 461 1) A minimum of two units must be provided. Each unit must be capable of
- 462 meeting the plant design capacity or the projected maximum daily demand
- 463 at the approved filtration rate.
- 464
- 465 2) Where more than two filter units are provided, the filters must be capable
- 466 of meeting the plant design capacity at the approved filtration rate with
- 467 one filter removed from service.
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- 3) Where declining rate filtration is provided, the variable aspect of filtration rates and the number of filters must be considered when determining the design capacity for the filters.
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- e) Structural Details and Hydraulics. The filter structure must be designed to provide for the following:
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- 1) vertical walls within the filter;
 - 2) no protrusion of the filter walls into the filter media;
 - 3) cover by superstructure;
 - 4) head and walking room to permit normal inspection and operation;
 - 5) minimum depth of filter box of 8.5 feet;
 - 6) minimum water depth over the surface of the filter media of 3 feet;
 - 7) trapped effluent to prevent backflow of air to the bottom of the filters;
 - 8) prevention of floor drainage to the filter with a minimum 4-inch curb around the filters;
 - 9) prevention of flooding by providing overflow;
 - 10) maximum velocity of treated water in pipe and conduits to filters of 2 ft/sec;
 - 11) cleanouts and straight alignment for influent pipes or conduits where solids loading is heavy, or following lime soda softening;
 - 12) construction to prevent cross connections, short-circuiting, or common walls between potable and non-potable water; and
 - 13) wash water drain capacity to carry maximum flow.
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- f) Wash water troughs must be constructed such that:
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- 1) the bottom elevation is above the maximum level of expanded media during washing;
 - 2) a 2-inch freeboard is provided at the maximum rate of wash;

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- 3) the top edge is level and is all at the same elevation;
 - 4) troughs are spaced so that each trough serves the same number of square feet of filter area; and
 - 5) the maximum horizontal travel of suspended particles to reach the trough does not exceed 3 feet.
- 521 g) The filter media must be composed of clean silica sand or other natural or
522 synthetic media free from detrimental chemical or bacterial contaminants and
523 must meet the following requirements:
524
- 1) a total depth of not less than 24 inches;
 - 526 2) a uniformity coefficient of the smallest material not greater than 1.65;
 - 527 3) a minimum of 12 inches of media with an effective size range of 0.45 mm
528 to 0.55 mm;
 - 529 4) filter media specifications:
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532 A) Filter anthracite must consist of hard, durable anthracite coal
533 particles of various sizes. Blending of non-anthracite material is
534 not acceptable. Anthracite must have:
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538 i) an effective size of 0.45 mm to 0.55 mm with uniformity
539 coefficient not greater than 1.65 when used alone;
 - 540
541 ii) an effective size of 0.8 mm to 1.2 mm with a uniformity
542 coefficient not greater than 1.7 when used as a cap;
 - 543
544 iii) an effective size less than 0.8 mm for anthracite used as a
545 single media on potable groundwater for iron and
546 manganese removal only (effective sizes greater than 0.8
547 mm may be approved based upon on site pilot plant
548 studies);
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550 iv) a specific gravity greater than 1.4;
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552 v) an acid solubility less than 5 percent; and
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554 vi) a Moh's scale of hardness greater than 2.7.

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- B) Sand must have:
 - i) an effective size of 0.45 mm to 0.55 mm;
 - ii) a uniformity coefficient of not greater than 1.65;
 - iii) a specific gravity greater than 2.5; and
 - iv) an acid solubility less than 5 percent.

- C) High density sand must consist of hard, durable, and dense grain garnet, ilmenite, hematite or magnetite, or associated minerals of those ores that will resist degradation during handling and use, and must:
 - i) contain at least 95 percent of the associated material with a specific gravity of 3.8 or higher;
 - ii) have an effective size of 0.2 to 0.3 mm;
 - iii) have a uniformity coefficient of not greater than 1.65; and
 - iv) have an acid solubility less than 5 percent.

- D) Granular activated carbon as a single media may be considered for filtration only after pilot or full-scale testing and with prior approval of the Agency. The design must include the following:
 - i) The media must meet the basic specifications for filter media in subsections (g)(1) through (g)(3).
 - ii) There must be provisions for a free chlorine residual and adequate contact time in the water following the filters and prior to distribution.
 - iii) Provisions must be made for frequent replacement or regeneration.

- E) Other media types or characteristics must be approved by the Agency;

- 5) supporting media designed as follows based on the type of filter material:

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- A) A three-inch layer of torpedo sand must be used as a supporting media for filter sand where supporting gravel is used, and must have:
 - i) an effective size of 0.8 mm to 2.0 mm; and
 - ii) a uniformity coefficient not greater than 1.7.

B) Gravel

- i) When gravel is used as the supporting media, it must consist of cleaned and washed, hard, durable, rounded silica particles and must not include flat or elongated particles.
- ii) The coarsest gravel must be 2.5 inches in size when the gravel rests directly on a lateral system, and must extend above the top of the perforated laterals.
- iii) Not less than four layers of gravel must be provided in accordance with the following size and depth distribution:

Size	Depth
2½ to 1½ inches	5 to 8 inches
1½ to ¾ inches	3 to 5 inches
¾ to ½ inches	3 to 5 inches
½ to 3/16 inches	2 to 3 inches
3/16 to 3/32 inches	2 to 3 inches

- iv) Reduction of gravel depths and other size gradations may be approved by the Agency upon justification for slow sand filtration or when proprietary filter bottoms are specified.

h) Filter Bottoms and Strainer Systems

- 1) Water quality must be reviewed prior to the use of porous plate bottoms to prevent clogging and failure of the underdrain system.
- 2) The design of manifold type collection systems must:
 - A) minimize loss of head in the manifold and laterals;

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- 641 B) ensure even distribution of washwater and even rate of filtration
642 over the entire area of the filter;
643
644 C) provide the ratio of the area of the strainer systems' final openings
645 to the area of the filter at about 0.003;
646
647 D) provide the total cross-sectional area of the laterals at about twice
648 the total area of the final openings;
649
650 E) provide the cross-sectional area of the manifold at 1.5 to 2 times
651 the total area of the laterals; and
652
653 F) direct lateral perforations without strainers downward.
654
655 3) The Agency may approve departures from these standards for high rate
656 filters and for propriety bottoms.
657
658 i) The following appurtenances must be provided for every filter:
659
660 1) influent and effluent sampling taps;
661
662 2) a gauge indicating loss of head;
663
664 3) a meter indicating the instantaneous rate of flow;
665
666 4) a pipe for filtering to waste that has a six inch or larger air gap, or other
667 Agency approved cross connection control measure;
668
669 5) a continuously recording Nephelometer capable of measuring and
670 recording filter effluent turbidity at maximum 15-minute intervals, and
671 with alarm capability to notify the operator if filtered water turbidity
672 exceeds 0.3 NTU (Nephelometric Units);
673
674 6) an adjustable rate valve to allow the operator to gradually control the flow
675 rate increase when placing the filters back into operation; and
676
677 7) a hose and storage rack for washing filter walls.
678
679 j) Backwash. Provisions must be made for washing filters as prescribed in this
680 subsection.
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- 1) The community water supply must use filtered water provided at the required rate by washwater tanks or a dedicated washwater pump to wash the filters.
 - 2) Backwash rate must meet the following requirements:
 - A) a minimum rate of 15 gal/min/ft², consistent with water temperatures and specific gravity of the filter media;
 - B) a rate sufficient to provide for a 50 percent expansion of the filter bed; and
 - C) a reduced rate of 10 gal/min/ft² for full depth anthracite or granular activated carbon filters, upon approval by the Agency.
 - 3) Washwater pumps in duplicate must be provided unless an alternate means of obtaining washwater is available.
 - 4) The main washwater line must have a regulator or valve to obtain the desired rate of filter wash with the washwater valves on the individual filters open wide.
 - 5) The main washwater line or backwash waste line must have a rate of flow indicator, preferably with a totalizer, located so that it can be easily read by the operator during the washing process.
 - 6) Rapid changes in backwash water flow must be prevented.
 - 7) Backwash must be completed with an operator in attendance to initiate the backwash cycle and to control the return-to-service procedure to assure that the effluent turbidity is less than 0.3 NTU when the filter is placed back into operation for discharge to the clearwell.
 - 8) Appropriate measures for cross connection control must be provided.
- k) Surface or subsurface wash facilities are required except for filters used exclusively for iron, radionuclides, arsenic or manganese removal. Wash facilities may include a system of fixed nozzles or a revolving-type apparatus. All devices must be designed:
- 1) to provide water pressures of at least 45 psi;

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- 724 2) if connected to the treated water system, to prevent back siphonage by
725 properly installing a vacuum breaker or other approved device; and
726
727 3) to provide a rate of flow of 2.0 gpm/ft² of filter area with fixed nozzles or
728 0.5 gpm/ft² with revolving arms.
729
- 730 1) Air scouring can be used in place of surface wash if the air scouring meets the
731 following requirements:
732
- 733 1) Air flow for air scouring the filter must be 3 to 5 ft³/min/ft² of filter area
734 when the air is introduced in the underdrain; a lower air rate must be used
735 when the air scour distribution system is placed above the underdrains;
736
- 737 2) A method to avoid filter media loss during backwashing must be provided;
738
- 739 3) Air scouring must be followed by a fluidization wash sufficient to
740 re-stratify the media;
741
- 742 4) Air must be free from contamination;
743
- 744 5) If air scour distribution systems are placed at the media and supporting
745 bed interface, the air scour nozzles must be designed to prevent media
746 from clogging the nozzles or the air entering the air distribution system;
747
- 748 6) Piping for the air distribution system must not be flexible hose or other
749 soft material;
750
- 751 7) Air delivery piping must not:
752
- 753 A) pass down through the filter media; and
754
- 755 B) have any arrangement in the filter design that would allow short-
756 circuiting between the applied unfiltered water and the filtered
757 water;
758
- 759 8) When air scouring is being utilized, the backwash rate must be variable
760 and must not exceed 8 gal/min, unless a higher rate is necessary to remove
761 scoured particles from filter media surfaces; and
762
- 763 9) Air scouring piping must not be installed in the underdrain unless the
764 underdrain was designed to accommodate the piping.
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766 (Source: Amended at 46 Ill. Reg. _____, effective _____)

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SUBPART G: DISINFECTION

Section 604.735 Chlorinator Piping

- a) Cross Connection Protection-
 - 1) The chlorinator piping must be designed to prevent contamination of the treated water.
 - 2) For all systems required to disinfect under Section 604.700, piping must be arranged to prevent back flow or back siphonage between multiple points of chlorine application.
 - 3) The water supply to each ~~educator~~reductor must have a separate shutoff valve.

- b) Pipe Material
 - 1) The pipes carrying elemental liquid or dry gaseous chlorine under pressure must be Schedule 80 seamless steel tubing or other materials recommended by The Chlorine Institute in Pamphlet 6, Piping Systems for Dry Chlorine, incorporated by reference in 35 Ill. Adm. Code 601.115. These pipes must not be PVC.
 - 2) Rubber, PVC, polyethylene (PE), or other materials recommended by The Chlorine Institute must be used for chlorine solution piping and fittings.
 - 3) Nylon products are not acceptable for any part of the chlorine solution piping system.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART H: SOFTENING

Section 604.805 Cation Exchange Process

- a) Pre-treatment under Section 604.1010(b) or (c) is required when the content of iron, manganese, or a combination of the two is 1 mg/L or more.

- b) Design requirements must provide:
 - 1) automatic regeneration based on volume of water softened; and

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- 810
- 811 2) a manual override on all automatic controls.
- 812
- 813 c) The design capacity for hardness removal must not exceed 20,000 grains per
- 814 cubic foot when resin is regenerated with 0.3 pounds of salt per 1000 grains of
- 815 hardness removed.
- 816
- 817 d) The depth of the exchange resin must not be less than 3 feet.
- 818
- 819 e) Flow Rates
- 820
- 821 1) The rate of softening must not exceed 7 gal/min/ft² of bed area.
- 822
- 823 2) The backwash rate must be 6 to 8 gal/min/ft² of bed area.
- 824
- 825 3) Rate of flow controllers or the equivalent must be installed.
- 826
- 827 f) The freeboard must be calculated based on the size and specific gravity of the
- 828 resin and the direction of water flow. Unless otherwise approved by the Agency
- 829 under Section 604.145(b), the washwater collector must be 24 inches above the
- 830 top of the resin on down flow units.
- 831
- 832 g) The bottoms, strainer systems and support for the exchange resin must conform to
- 833 criteria provided for rapid rate gravity filters in Section 604.605(f) and (g).
- 834
- 835 h) Brine must be evenly distributed over the entire surface of both upflow and
- 836 downflow units.
- 837
- 838 i) Backwash, rinse and air relief discharge pipes must be installed to prevent any
- 839 possibility of back siphonage.
- 840
- 841 j) Bypass Piping and Equipment
- 842
- 843 1) Bypass must be provided around softening units to produce a blended
- 844 water of desirable hardness.
- 845
- 846 2) Totalizing meters must be installed on the bypass line and on each softener
- 847 unit.
- 848
- 849 3) The bypass line must have a shutoff valve. An automatic proportioning or
- 850 regulating device is recommended.
- 851

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- 852 k) When the applied water contains a chlorine residual, the cation exchange resin
853 must be a type that is not damaged by residual chlorine.
854
- 855 l) Sampling Taps
856
- 857 1) Smooth-nosed sampling taps must be provided for the collection of
858 representative samples.
859
- 860 2) The taps must be located to provide for sampling of the softener influent,
861 effluent and blended water.
862
- 863 3) The sampling taps for the blended water must be at least 20 feet
864 downstream from the point of blending.
865
- 866 4) Petcocks are not acceptable as sampling taps.
867
- 868 m) Brine and Salt Storage Tanks:
869
- 870 1) Salt dissolving or brine tanks and wet salt storage tanks must be covered
871 and must be corrosion resistant.
872
- 873 2) The make-up water inlet must be protected from back siphonage. Water
874 for filling the tank must be distributed over the entire surface by pipes
875 above the maximum brine level in the tank. An automatic declining level
876 control system on the make-up water line is recommended.
877
- 878 3) Wet salt storage basins must be equipped with manholes or hatchways for
879 access and for direct dumping of salt from truck or railcar. Openings must
880 be provided with raised curbs and watertight covers having overlapping
881 edges similar to those required for finished water reservoirs.
882
- 883 4) Overflows, where provided, must be protected with corrosion resistant
884 screens and must terminate with either a turned down bend having a
885 proper free fall discharge or a self-closing flap valve.
886
- 887 5) The salt must be supported on graduated layers of gravel placed over a
888 brine collection system.
889
- 890 6) Alternative designs that are conducive to frequent cleaning of the wet salt
891 storage tank may be approved by the Agency.
892
- 893 7) Total salt storage must provide for at least 30 days of operation.
894

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- 895 n) Corrosion control must be provided under Subpart I.
896
897 o) Suitable disposal must be provided for brine waste.
898
899 p) Pipes and contact materials must be resistant to the aggressiveness of salt. Plastic
900 and red brass are acceptable piping materials. Steel and concrete must be coated
901 with a non-leaching protective coating that is compatible with salt and brine.
902
903 q) Dry bulk salt storage must be enclosed and separated from other operating areas
904 to prevent damage to equipment.
905

906 (Source: Amended at 46 Ill. Reg. _____, effective _____)
907

SUBPART I: STABILIZATION

Section 604.900 General Stabilization Requirements

- 911
912 a) Water distributed by community water supplies must be stable so as to not cause a
913 violation of 35 Ill. Adm. Code 601.101(a).
914
915 b) The following water quality parameters of finished water must be evaluated to
916 ensure that water quality parameters minimize corrosion and minimize deposition
917 of excess calcium carbonate (CaCO_3) scale throughout the distribution system of
918 the community water supply:
919
920 1) alkalinity (as CaCO_3);
921
922 2) total hardness (as CaCO_3);
923
924 3) calcium hardness (as CaCO_3);
925
926 4) temperature;
927
928 5) pH;
929
930 6) chloride;
931
932 7) sulfate;
933
934 8) total dissolved solids;
935
936 9) oxidation reduction potential;
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- 938 10) conductivity;
939
940 11) iron;
941
942 12) manganese;
943
944 13) orthophosphate, if applicable; and
945
946 14) silica, if applicable.
947

948 c) The following may be used to determine the corrosivity of water distributed by a
949 community water supply:

950 1) Lead and Copper

951
952 A) Optimal Corrosion Control Treatment Evaluation Technical
953 Recommendations for Primacy Agencies and Public Water
954 Systems, USEPA (March 2016); Office of Water (4606M); EPA
955 816-B-16-003, incorporated by reference at 35 Ill. Adm. Code
956 601.115;
957

958 B) Chloride Sulfate Mass Ratio (CSMR), calculated as follows:
959
960

$$961 \text{ CSMR} = \frac{\text{Cl}^-, \text{ expressed as mg/L}}{\text{SO}_4^-, \text{ expressed as mg/L}};$$

962 C) Coupon and pipe loop studies.
963
964

965 2) Iron and Steel
966 Larson-Skold Index (L-SI), calculated as follows:
967

$$968 \text{ LSI} = (\text{Cl} + \text{SO}_4) / \text{alkalinity}$$

969
970 (All parameters expressed as mg/L of equivalent CaCO₃)
971

972 BOARD NOTE: The following equation provides a simplified procedure
973 for calculating L-SI:
974

$$975 \text{ LSI} = \frac{(1.41)(\text{mg/L Cl}^-) + (1.04)(\text{mg/L SO}_4^{2-})}{\text{mg/L alkalinity (as CaCO}_3)}$$

976
977 Cl⁻ expressed as mg/L chloride

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- 978 SO₄⁻² expressed as mg/L sulfate
979
980 3) Iron Steel and Concrete
981
982 A) Calcium Carbonate Precipitation Potential (CCPP)₂ as referenced
983 in Method 2330 C Standard Methods for Examination of Water
984 and Wastewater, 22nd edition, incorporated by reference in 35 Ill.
985 Adm. Code 611.102.
986
987 B) For water containing phosphates:
988
989 i) The Alkalinity Difference Technique, as described in
990 Method 2330 B.3.b and 2330 C.2.b Standard Methods for
991 Examination of Water and Wastewater, 22nd edition,
992 incorporated by reference in 35 Ill. Adm. Code 611.102.
993 The CCPP is the difference between the initial and
994 equilibrated water's alkalinity (or calcium) values, when
995 expressed as CaCO₃.
996
997 ii) The Marble Test, as described in Method 2330 C.2.c
998 Standard Methods for Examination of Water and
999 Wastewater, 22nd edition, incorporated by reference in 35
1000 Ill. Adm. Code 611.102. The Marble Test is similar to the
1001 Alkalinity Difference Technique. The CCPP equals the
1002 change in alkalinity (or calcium) values during
1003 equilibration, when expressed as CaCO₃.
1004
1005 d) The following may be used to determine deposition of excess CaCO₃ scale:
1006
1007 1) CCPP, as referenced in Method 2330 B Standard Methods for
1008 Examination of Water and Wastewater, 22nd edition, incorporated by
1009 reference in 35 Ill. Adm. Code 611.102.
1010
1011 2) For water containing phosphates:
1012
1013 A) The Alkalinity Difference Technique, as described in Method 2330
1014 B.3.b and 2330 C.2.b Standard Methods for Examination of Water
1015 and Wastewater, 22nd edition, incorporated by reference in Section
1016 611.102. The CCPP is the difference between the initial and
1017 equilibrated water's alkalinity (or calcium) values, when expressed
1018 as CaCO₃.
1019

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- 1020 B) The Marble Test as described in Method 2330 C.2.c Standard
1021 Methods for Examination of Water and Wastewater, 22nd edition,
1022 incorporated by reference in Section 611.102. The Marble Test is
1023 similar to the Alkalinity Difference Technique. The CCPP equals
1024 the change in alkalinity (or calcium) values during equilibration,
1025 when expressed as CaCO₃.

1026
1027 BOARD NOTE: Calcium Carbonate Precipitation Potential (CCPP) can be calculated
1028 using Trussell Technologies software: www.trusselltech.com/downloads?category=6.

1029
1030 CCPP does not apply to protection or corrosion of lead and copper plumbing materials or
1031 to water containing phosphates. See "Internal Corrosion and Deposition Control", Water
1032 Quality & Treatment, A Handbook on Drinking Water, 6th ed. (2011), American Water
1033 Works Association.

1034
1035 BOARD NOTE: Estimating Calcium Carbonate Precipitation Potential (CCPP) using the
1036 Alkalinity Difference Technique or the Marble Test, both referenced in Standard
1037 Methods for Examination of Water and Wastewater, 22nd edition, incorporated by
1038 reference at 35 Ill. Adm. Code 611.102, is described as "Calcium Carbonate Saturation".
1039 Simplified Procedures for Water Examination, Manual of Water Supply Practices M12
1040 (5th ed. 2002), American Water Works Association.

1041
1042 Based on results of the "Calcium Carbonate Saturation" test, CCPP can be calculated as:

1043
1044
$$\text{CCPP} = \text{Final mg/L alkalinity (as CaCO}_3\text{)} - \text{Initial mg/L alkalinity (as CaCO}_3\text{)}$$

1045
1046 Water is unsaturated with respect to calcium carbonate and may be corrosive if final
1047 alkalinity is greater than initial alkalinity, a positive value in the equation above. If there
1048 is alkalinity gain in the final alkalinity test, it indicates tendency to dissolve calcium
1049 carbonate scale.

1050
1051 Water is oversaturated with calcium carbonate scale and may deposit calcium carbonate
1052 coating in the water mains if final alkalinity is less than initial alkalinity, a negative value
1053 in the equation above. If there is alkalinity loss in the final alkalinity test, it indicates
1054 tendency to precipitate calcium carbonate scale. If final and initial alkalinity are the
1055 same, the water is stable and in equilibrium with calcium carbonate.

1056
1057 CCPP is not applicable to protection or corrosion of lead and copper plumbing materials.

1058
1059 Verifying the alkalinity titration endpoint by using a pH meter to verify the pH of the
1060 titrated alkalinity sample is recommended, since titration endpoint visual color change
1061 may be individually variable. If pH of the sample is not certain, consider using pH of
1062 4.50 to represent the endpoint. See "Alkalinity Test", Standard Methods for Examination

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1063 of Water and Wastewater, 22nd edition, incorporated by reference in 35 Ill. Adm. Code
1064 611.102.

- 1065
- 1066 e) Acceptable stability treatments include:
- 1067
- 1068 1) carbon dioxide addition;
- 1069
- 1070 2) acid addition;
- 1071
- 1072 3) phosphate addition;
- 1073
- 1074 4) split treatment;
- 1075
- 1076 5) alkali chemical:
- 1077
- 1078 A) hydrated lime
- 1079
- 1080 B) sodium carbonate
- 1081
- 1082 C) sodium bicarbonate
- 1083
- 1084 D) sodium hydroxide;
- 1085
- 1086 6) carbon dioxide reduced by aeration;
- 1087
- 1088 7) calcium hydroxide; and
- 1089
- 1090 8) sodium silicate addition.
- 1091
- 1092 f) When chemical addition is used for stabilization, the community water supply
1093 must comply with requirements of Subpart K.

1094
1095 (Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART J: OTHER TREATMENT

Section 604.1005 Anion Exchange

- 1100
- 1101 a) Pre-treatment Requirements. Pre-treatment under Section 604.1010 is required
1102 when a combination of iron and manganese exceeds 0.5 mg/L.
- 1103
- 1104 b) Anion Exchange Treatment Design
- 1105

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- 1) Automatic regeneration based on volume of water treated must be used unless manual regeneration is justified and is approved by the Agency.
 - 2) If a portion of the water is bypassed around the units and blended with treated water, the following requirements must be met:
 - A) the maximum blend ratio allowable must be determined based on the highest anticipated raw water nitrate level; and
 - B) a totalizing meter and a proportioning or regulating device or flow regulating valves must be provided on the bypass line.
 - 3) A manual override must be provided on all automatic controls.
 - 4) Adequate freeboard must be provided to accommodate the backwash flow rate of the unit, ensuring the resin will not overflow. The freeboard must be calculated based on the size and specific gravity of the resin.
 - 5) The system must be designed to include an adequate under drain and supporting gravel system and brine distribution equipment.
 - 6) Sampling Taps
 - A) Smooth-nosed sampling taps must be provided for the collection of representative samples.
 - B) The taps must be located to provide for sampling of the softener influent, effluent and blended water.
 - C) The sampling taps for the blended water must be at least 20 feet downstream from the point of blending.
 - D) Petcocks are not acceptable as sampling taps.
 - 7) Brine and Salt Storage Tanks:
 - A) Salt dissolving or brine tanks and wet salt storage tanks must be covered and must be corrosion resistant.
 - B) The make-up water inlet must be protected from back siphonage. Water for filling the tank must be distributed over the entire surface by pipes above the maximum brine level in the tank. An

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- 1148 automatic declining level control system on the make-up water line
1149 is recommended.
- 1150
- 1151 C) Wet salt storage basins must be equipped with manholes or
1152 hatchways for access and for direct dumping of salt from truck or
1153 railcar. Openings must be provided with raised curbs and
1154 watertight covers having overlapping edges similar to those
1155 required for finished water reservoirs.
- 1156
- 1157 D) Overflows, where provided, must be protected with corrosion
1158 resistant screens and must terminate with either a turned downward
1159 bend having a proper free fall discharge or a self-closing flap
1160 valve.
- 1161
- 1162 E) The salt must be supported on graduated layers of gravel placed
1163 over a brine collection system.
- 1164
- 1165 F) Alternative designs that are conducive to frequent cleaning of the
1166 wet salt storage tank may be approved by the Agency.
- 1167
- 1168 G) Total salt storage must provide for at least 30 days of operation.
- 1169
- 1170 c) Exchange Capacity. The design capacity for nitrate removal must not exceed
1171 10,000 grains per cubic foot when the resin is regenerated at 15 pounds of salt per
1172 cubic foot of resin.
- 1173
- 1174 d) Number of Units. At least two units must be provided. The treatment capacity
1175 must be capable of producing the maximum average daily demand at a level
1176 below the nitrate/nitrite MCL, with one exchange unit out of service.
- 1177
- 1178 e) Type of Media. The anion exchange media must be of the nitrate selective type.
- 1179
- 1180 f) Flow Rates. Unless otherwise approved by the Agency under Section 604.145(b),
1181 the following flow rates apply:
- 1182
- 1183 1) The treatment flow rate must not exceed 5 gal/min/ft² of bed area.
- 1184
- 1185 2) The backwash flow rate must be between 4.0 and 6.0 gal/min/ft² of bed
1186 area.
- 1187
- 1188 3) The regeneration rate must be approximately 1.0 gal/min/ft² of bed area
1189 with a fast rinse approximately equal to the service flow rate.
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- 1191 g) Cross Connection Control. Backwash, rinse and air relief discharge pipes must be
1192 installed to prevent any possibility of back-siphonage.
1193
- 1194 h) Construction Materials. Pipes and contact materials must be resistant to the
1195 aggressiveness of salt. Plastic and red brass are acceptable materials. Steel and
1196 concrete must be coated with a non-leaching protective coating that is compatible
1197 with salt and brine.
1198
- 1199 i) Housing. Dry bulk salt storage must be enclosed and separated from other
1200 operating areas to prevent damage to equipment.
1201
- 1202 j) Preconditioning of the Media. Prior to startup of the equipment, the media must
1203 be regenerated with no less than two bed volumes of water containing sodium
1204 chloride followed by an adequate rinse.
1205

1206 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1207

Section 604.1010 Iron and Manganese Control

- 1208
1209
- 1210 a) Except as provided in 35 Ill. Adm. Code 611.300(e), treatment is required to meet
1211 the iron and manganese MCL as stated in Section 611.300(b).
1212
- 1213 b) Removal of Iron and Manganese by Oxidation, Detention and Filtration
1214
- 1215 1) Oxidation must be by aeration, as indicated in Subpart D, unless the
1216 community water supply demonstrates chemical oxidation provides
1217 equivalent results to aeration. Chemicals that may be used for oxidation
1218 include chlorine, sodium permanganate, potassium permanganate, ozone
1219 or chlorine dioxide.
1220
- 1221 2) Detention
1222
- 1223 A) A minimum detention time of 30 minutes must be provided
1224 following aeration to ensure that the oxidation reactions are
1225 complete prior to filtration. This minimum detention time may be
1226 modified only when a pilot plant study indicates completion of
1227 oxidation reactions in less time.
1228
- 1229 B) The reaction tank/detention basin must be provided with an
1230 overflow, vent and access hatch in accordance with Subpart M.
1231
- 1232 3) Filtration. Filters must conform to Subpart F.
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- c) Removal by Manganese Greensand or Manganese Coated Media Filtration:
 - 1) Permanganate or chlorine must be added to the water upstream of the filter, per manufacturer's recommendation.
 - 2) An anthracite media cap of at least six inches must be provided over manganese greensand.
 - 3) Normal backwash rate is 8 gal/min/ft² with filters containing manganese greensand and 15 gal/min with manganese coated media.
 - 4) Sample taps must be provided:
 - A) prior to application of permanganate;
 - B) immediately ahead of filtration;
 - C) at points between the anthracite media and the manganese greensand;
 - D) halfway down the manganese greensand; and
 - E) at the filter effluent.
 - d) Sequestration of Iron and/or Manganese by Polyphosphates
 - 1) Sequestration by polyphosphates must not be used when the combination of iron and manganese exceeds 1 mg/L.
 - 2) Phosphate solution must be kept covered and disinfected by carrying approximately 10 mg/L free chlorine residual unless the phosphate is not able to support bacterial growth and the phosphate is being fed from the covered shipping container. Phosphate solutions having a pH of 2.0 or less may also be exempted from this requirement by the Agency.
 - 3) Polyphosphates must not be applied ahead of iron and manganese removal treatment. The point of application must be prior to aeration, oxidation or disinfection.
 - 4) The phosphate feed point must be located as far ahead of the oxidant feed point as possible.
 - e) Sequestration of Iron and/or Manganese by Sodium Silicates:

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- 1) Sequestration by sodium silicate must not be used when iron, manganese or a combination of iron and manganese exceeds 2 mg/L.
 - 2) A full-scale demonstration will be required to determine the suitability of sodium silicate for the particular water and the minimum feed needed.
 - 3) Chlorine or chlorine dioxide addition must accompany the sodium silicate addition.
 - 4) Sodium silicate must not be applied ahead of iron or manganese removal treatment.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART K: CHEMICAL APPLICATION

Section 604.1105 Feed Equipment and Chemical Storage

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- a) Solution Feed Equipment:
 - 1) Corrosion resistant containers must be provided for solution feeders.
 - 2) Containers must have non-corrodible covers with overhanging edges. Openings must be constructed to prevent contamination.
 - 3) Scales or a volumetric measuring device must be provided for determining the amount of solution fed.
 - b) Feeder Redundancy
 - 1) When chemical feed is necessary for the protection of the supply, such as chlorination, coagulation or other essential processes:
 - A) a minimum of two feeders must be provided with each having adequate capacity to provide the maximum dosage necessary; and
 - B) the standby unit or a combination of units of sufficient size to meet capacity must be provided to replace the largest unit when out of service.
 - 2) A separate feeder must be used for each chemical applied.

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- 3) Each chemical feeder and day tank must be identified with its content.
 - 4) Spare parts must be available on site for all feeders and chemical booster pumps to replace parts that are subject to wear and damage.
- c) Control
- 1) At automatically operated facilities:
 - A) The automatic controls must be designed to allow override by manual controls.
 - B) Chemical feeders must be electrically interconnected with the well or service pump so that they will not operate if the well or service pump is not operating.
 - 2) Chemical feed rates must be proportional to the flow stream to achieve the appropriate dose of chemical application.
 - 3) A means to measure water flow stream being dosed must be provided to determine chemical feed rates.
 - 4) Provisions must be made for measuring the quantities of chemicals used.
 - 5) Weighing Scales
 - A) Weighing scales must be capable of providing reasonable precision in relation to average daily dose.
 - B) Unless otherwise approved by the Agency under Section 604.145(b), treatment chemicals in gaseous state must be weighed;
 - C) Fluoride solution fed from supply drums or carboys must be weighed; and
 - D) Volumetric dry chemical feeders must be weighed unless otherwise approved by the Agency under Section 604.145(b).
- d) Dry chemical feeders must:
- 1) measure chemicals volumetrically or gravimetrically;

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- 2) provide adequate water and agitation of the chemical within the slurry tank; and
 - 3) completely enclose chemicals to prevent emission of dust to the operating room.
 - e) Positive Displacement Solution Pumps
 - 1) Positive displacement type solution feed pumps may be used to feed liquid chemicals, but must not be used to feed chemical slurries.
 - 2) Pumps must be capable of operating at the required maximum rate against the maximum head conditions found at the point of injection.
 - 3) Calibration tubes or mass flow monitors that allow for direct physical measurement of actual feed rates must be provided.
 - f) To ensure that chemical solutions cannot be siphoned or overfed into the water supply, liquid chemical feeders must:
 - 1) assure discharge at a point of positive pressure;
 - 2) provide vacuum relief; or
 - 3) provide a suitable air gap or anti-siphon device.
 - g) Cross connection control must be provided to assure that:
 - 1) the make-up water lines discharging to liquid storage tanks must be properly protected from backflow;
 - 2) no direct connection exists between any sewer and a drain or overflow from a chemical feed system; and
 - 3) all overflows and drains from a chemical field system must have an airgap above the sewer or overflow rim of a receiving sump.
 - h) Chemical feed equipment location must be readily accessible for servicing, repair and observation of operation.
 - i) Make-up-water lines must be:

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- 1404 1) obtained from the finished water supply, or from a location sufficiently
1405 downstream of any chemical feed point to assure adequate mixing; and
1406
1407 2) ample in quantity and adequate in pressure.
1408
- 1409 j) Storage of Chemicals
1410
- 1411 1) Space must be provided for:
1412
- 1413 A) at least 30 days of chemical supply;
1414
1415 B) convenient and efficient handling of chemicals;
1416
1417 C) dry storage conditions; and
1418
1419 D) a minimum storage volume of 1.5 times the gross shipping volume.
1420
- 1421 2) Offloading areas must be clearly labeled to prevent accidental cross-
1422 contamination.
1423
- 1424 3) Chemicals must not be stored in confined spaces.
1425
- 1426 4) Chemicals must be stored in covered or unopened shipping containers,
1427 unless the chemical is transferred into an approved storage unit.
1428
- 1429 5) Feed equipment and storage chemicals must be stored inside a building
1430 unless otherwise approved by the Agency under Section 604.145(b).
1431
- 1432 6) Liquid chemical storage tanks must have a liquid level indicator.
1433
- 1434 7) Secondary Containment
1435
- 1436 A) Liquid chemical storage tanks must have secondary containment
1437 consisting of an overflow and a receiving basin capable of
1438 receiving accidental spills or overflows without uncontrolled
1439 discharge.
1440
- 1441 B) A common receiving basin may be provided for each group of
1442 compatible chemicals that provides sufficient containment volume
1443 to prevent accidental discharge in the event of failure of the largest
1444 tank. Groups of compatible chemicals are as follows: acids, bases,
1445 salts and polymers, absorption powders, oxidizing powders and
1446 compressed gases.

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- 8) Vents from storage tanks must have a corrosion resistant 24 mesh screen.
 - k) Bulk Liquid Storage Tanks
 - 1) A uniform strength of chemical solution must be maintained. Continuous agitation must be provided to maintain slurries in suspension.
 - 2) A means to assure continuity of chemical supply must be provided.
 - 3) Means must be provided to measure the liquid level in the tank.
 - 4) Liquid storage tanks including any access openings must be kept securely covered.
 - 5) Overflow pipes, when provided, must:
 - A) be turned downward, with the end screened;
 - B) have a free fall discharge; and
 - C) be located where noticeable.
 - 6) Liquid storage tanks must be vented, but not through vents in common with other chemicals or day tanks.
 - 7) Each liquid storage tank must be provided with a valved drain in accordance with subsection (g).
 - 8) Solution tanks must be located, and protective curbing provided, so that chemicals from equipment failure, spillage or accidental drainage do not enter the water in conduits, treatment or storage basins. Chemicals must be stored as required by subsection (j)(5).
 - l) Day Tanks
 - 1) Day tanks must be provided where bulk storage of liquid chemical is provided.
 - 2) Day tanks must meet all the requirements of subsection (k), except that shipping containers do not require overflow pipes and subsection drains.

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- 3) Day tanks must be scale-mounted, or have a calibrated gauge painted or mounted on the side if liquid level can be observed in a gauge tube or through translucent sidewalls of the tank. In opaque tanks, a gauge rod may be used. The ratio of the area of the tank to its height must be such that unit readings are meaningful in relation to the total amount of chemical fed during a day.
 - 4) Except for fluosilicic acid, hand pumps may be provided for transfer from a shipping container. When motor-driven transfer pumps are provided, a liquid level limit switch must be provided.
 - 5) Tanks and tank refilling line entry points must be clearly labeled with the name of the chemical contained.
 - 6) Filling of day tanks must not be automated.
- m) Feed lines must be:
- 1) of durable, corrosion-resistant material;
 - 2) protected against freezing;
 - 3) designed to prevent clogging; and
 - 4) color coded and labeled in accordance with Section 604.120.
- n) Handling. Provision must be made for the proper transfer of dry chemicals from shipping containers to storage bins or hoppers, in such a way as to minimize the quantity of dust that may enter the room.
- o) Housing
- 1) Floor surfaces must be smooth and impervious, slip-proof and well drained.
 - 2) Vents from feeders, storage facilities and equipment exhaust must discharge to the outside atmosphere above grade and remote from air intakes.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART M: STORAGE

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1532 **Section 604.1350 Combination Pressure Tanks and Ground Storage**

1533
1534 A combination of ground storage, hydropneumatic storage and pumps may be considered in
1535 water systems for maintaining pressure on the distribution system. Design of such a system must
1536 include:

- 1537
- 1538 a) a minimum ground storage volume equivalent to 1.5 times the average daily
1539 usage;
 - 1540
 - 1541 b) a minimum of two pumps, each capable of meeting the peak hourly flow provided
1542 in Section 604.115(d). If more than two pumps are proposed, the peak hourly
1543 flow must be met when any pump is out of service;
 - 1544
 - 1545 c) an electric generator with automatic start capable of providing power to pumps
1546 that can produce the peak hourly flow ~~as~~ provided in Section 604.115(d), plus
1547 sufficient power to operate all chemical feeders, appurtenances and equipment
1548 essential to plant operation. Consideration must be given to sizing the generator
1549 to provide power for at least one well; and
 - 1550
 - 1551 d) a hydropneumatic tank sized to provide service for a minimum of 10 minutes
1552 under the peak hourly flow provided in Section 604.115(d).

1553
1554 (Source: Amended at 46 Ill. Reg. _____, effective _____)

1555
1556 **SUBPART O: CROSS CONNECTIONS**

1557
1558 **Section 604.1510 Cross Connection Control Device Inspectors**

- 1559
- 1560 a) Except as provided in subsection (c), cross connection control devices must be
1561 inspected at least annually by a person approved by the Agency or its designee as
1562 a cross connection control device inspector (CCCDI). The inspection of
1563 mechanical devices must include physical testing in accordance with the
1564 manufacturer's instructions.
 - 1565
 - 1566 1) Records of the annual inspection must be submitted to the community
1567 water supply.
 - 1568
 - 1569 2) Each device inspected must have a tag attached listing the date of the most
1570 recent test, name of CCCDI, and type and date of repairs.
 - 1571
 - 1572 3) A maintenance log must be maintained at the site of installation and must
1573 include:

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- 1575 A) make, model and serial number of the backflow preventer, and its
1576 location at the site;
1577
1578 B) date of each test;
1579
1580 C) name and approval number of person performing the test;
1581
1582 D) type of test kit used and date of its most recent calibration;
1583
1584 E) test results and a brief statement indicating whether the results pass
1585 or fail the test;
1586
1587 F) repairs or servicing required;
1588
1589 G) repairs and date completed; and
1590
1591 H) servicing performed and date completed.
1592
1593 b) Requirements for Cross Connection Control Device Inspector Approval
1594
1595 1) Each applicant for CCCDI Approval must:
1596
1597 A) be a person authorized to perform plumbing as described in the
1598 Illinois Plumbing License Law [225 ILCS 320/3(1)].
1599
1600 B) complete a training course offered by the Environmental Resources
1601 Training Center (see 110 ILCS 530) or the Agency's delegate on
1602 cross connection control device that includes hands on practice
1603 testing of different types of backflow devices and proper
1604 maintenance and repair.
1605
1606 C) complete and submit an application for CCCDI Approval.
1607
1608 D) successfully complete both written and performance examinations
1609 demonstrating competency in the following: the principles of
1610 backflow and back-siphonage; the hazard presented to a potable
1611 water system; locations that require installation of cross-
1612 connection~~eross-connection~~ control devices; identifying, locating,
1613 inspecting, testing, maintaining and repairing cross-connection
1614 control methods and devices in-line, as located throughout each
1615 system that connects to a community public water supply. The
1616 applicant must successfully complete:
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- i) the written examination with a minimum score of 75%; and
 - ii) a performance-based examination by demonstrating competency in testing device procedures on all types of devices at the examination center.
- 2) CCCDIs must renew the CCCDI Approval each year between May 1 and June 30. An application for CCCDI renewal will be sent by the Agency or its designee, and must be completed and returned by June 30 of the renewal year. CCCDIs must complete an eight-hour recertification course every three years from the date of the original issuance of the CCCDI license. The course must be offered by the Environmental Resources Training Center or the Agency's delegate and include a written and practical exam demonstrating competency in backflow prevention testing.
- 3) A CCCDI Approval or admission to examination for CCCDI Approval must be suspended, revoked or not issued by the Agency for any one or more of the following causes:
- A) Practice of any fraud or deceit in obtaining or attempting to obtain a CCCDI Approval, including misrepresentation of approval;
 - B) Any repeated, flagrant or willful negligence or misconduct in the inspection, testing or maintenance of cross connection control devices;
 - C) Falsification of reports required by this Part;
 - D) Willful violation of the Environmental Protection Act or any rules adopted under it.
- 4) Suspension and Revocation Procedures
- A) Any person may file with the Agency a written complaint regarding the conduct of a CCCDI approved under this Part. The complaint must state the name and address of the complainant, the name of the CCCDI, and all information that supports the complaint.
 - B) The Agency may initiate the suspension or revocation procedure on the basis of any written complaint or on its own motion. The Agency's decision to institute suspension or revocation

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- 1660 proceedings will be based on the seriousness of the violation and
1661 its potential deleterious impact upon public health and safety.
1662
1663 C) When the suspension or revocation procedure is initiated, the
1664 Agency must notify the CCCDI by certified mail that suspension
1665 or revocation is being sought. The notice must specify the cause
1666 upon which suspension or revocation is sought and include the
1667 procedures for requesting a hearing before the Agency. Request
1668 for hearing must be made in writing within 14 days after receipt of
1669 the Agency's certified notification. If no hearing is requested, the
1670 Agency will suspend or revoke the CCCDI Approval.
1671
1672 D) Should a hearing be requested, the Director must appoint one or
1673 more Agency employees to chair the proceedings. The hearing
1674 must be conducted according to the hearing requirements of 35 Ill.
1675 Adm. Code 168.
1676
1677 E) The Director must make a decision within 30 days after receiving
1678 the hearing transcript. The Director must give written notice of
1679 that decision and reasons for the decision to the CCCDI by
1680 certified mail.
1681
1682 F) Within 30 days after receiving a notice of suspension or revocation
1683 from the Agency, the CCCDI may appeal the suspension or
1684 revocation to the Pollution Control Board. The suspension or
1685 revocation of the CCCDI's Approval must be stayed pending a
1686 final decision on the appeal by the Board.
1687
1688 c) Backflow preventers located in the treatment plant, wellhouse or booster station
1689 of a community public water supply facility must be inspected at least annually by
1690 either an approved CCCDI or by a certified water supply operator who has
1691 completed the qualifications listed in subsections (b)(1)(B) and (D).
1692
1693 1) When the inspection is conducted by a certified water supply operator who
1694 has completed the necessary qualifications, records must be kept as
1695 required by subsection (a)(3).
1696
1697 2) Each device inspected must have a tag attached listing the date of the most
1698 recent test, name of the CCCDI, and type and date of repairs.
1699

(Source: Amended at 46 Ill. Reg. _____, effective _____)

Section 604.1520 COVID-19 Emergency Provisions (Repealed)

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~~Due to the public health emergency related to the COVID-19 outbreak, the CCCDI approval renewal application deadlines for 2020 pursuant to Section 604.1510(b)(2) are extended. For renewal year 2020, CCCDIs must renew their CCCDI Approval between August 31 and October 30. An application for CCCDI renewal will be sent by the Agency or its designee and must be completed and returned by October 30, 2020.~~

(Source: Repealed at 46 Ill. Reg. _____, effective _____)



~~POLLUTION CONTROL BOARD~~

~~NOTICE OF PROPOSED AMENDMENTS~~

0 TITLE 35: ENVIRONMENTAL PROTECTION
 1 SUBTITLE F: PUBLIC WATER SUPPLIES
 2 CHAPTER I: POLLUTION CONTROL BOARD

3
 4 PART 604
 5 DESIGN, OPERATION AND MAINTENANCE CRITERIA

6
 7 SUBPART A: GENERAL PROVISIONS

8
 9Section
 10604.100 Purpose
 11604.105 General Requirements
 12604.110 Location
 13604.115 Usage
 14604.120 Piping Identification
 15604.125 Automatic Equipment
 16604.130 Operational Testing Equipment
 17604.135 Repair Work and Emergency Operation
 18604.140 Nitrification Action Plan
 19604.145 Exceptions for Community Water Supplies
 20604.150 Protection of Community Water Supply Structures
 21604.155 Electrical Controls and Standby Power
 22604.160 Safety
 23604.165 Monthly Operating Report
 24604.170 Security

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 26 SUBPART B: SOURCE DEVELOPMENT

27
 28Section
 29604.200 General Requirements
 30604.205 Surface Water Quantity
 31604.210 Surface Water Quality
 32604.215 Surface Water Structures
 33604.220 Invasive Mussel Control
 34604.225 Reservoirs
 35604.230 Groundwater Quantity
 36604.235 Groundwater Quality
 37604.240 General Well Construction

~~POLLUTION CONTROL BOARD~~

~~NOTICE OF PROPOSED AMENDMENTS~~

38604.245	Well Testing and Records
39604.250	Aquifer Types and Construction Methods
40604.255	Well Pumps, Discharge Piping and Appurtenances
41	
42	
43	SUBPART C: SOURCE WATER PROTECTION PLAN
44	
45	Section
46604.300	Purpose
47604.305	Source Water Protection Plan Requirement and Contents
48604.310	Vision Statement
49604.315	Source Water Assessment
50604.320	Source Water Protection Plan Objectives
51604.325	Action Plan
52604.330	Submission
53604.335	Agency Approval
54604.340	Evaluation and Revision
55	
56	SUBPART D: AERATION
57	
58	Section
59604.400	General Requirements for Aeration
60604.405	Forced or Induced Draft Aeration
61604.410	Spray Aeration
62604.415	Pressure Aeration
63604.420	Packed Tower Aeration
64604.425	Other Methods of Aeration
65	
66	SUBPART E: CLARIFICATION
67	
68	Section
69604.500	General Clarification Requirements
70604.505	Coagulation
71604.510	Flocculation
72604.515	Sedimentation
73604.520	Solids Contact Unit
74604.525	Tube or Plate Settlers
75604.530	Other High Rate Clarification Processes

~~POLLUTION CONTROL BOARD~~

~~NOTICE OF PROPOSED AMENDMENTS~~

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SUBPART F: FILTRATION

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79Section

80604.600

Filtration

81604.605

Rapid Rate Gravity Filters

82604.610

Rapid Rate Pressure Filters

83604.615

Deep Bed Rapid Rate Gravity Filters

84604.620

Biologically Active Filtration

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SUBPART G: DISINFECTION

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88Section

89604.700

Disinfection Requirement

90604.705

Chlorination Equipment

91604.710

Points of Application

92604.715

Contact Time

93604.720

Inactivation of Pathogens

94604.725

Residual Chlorine

95604.730

Continuous Chlorine Analyzers

96604.735

Chlorinator Piping

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SUBPART H: SOFTENING

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100Section

101604.800

Lime or Lime-soda Process

102604.805

Cation Exchange Process

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SUBPART I: STABILIZATION

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106Section

107604.900

General Stabilization Requirements

108604.905

Carbon Dioxide Addition

109604.910

Phosphates

110604.915

Split Treatment

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SUBPART J: OTHER TREATMENT

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POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

114Section

115604.1000 Presedimentation
116604.1005 Anion Exchange
117604.1010 Iron and Manganese Control
118604.1015 Taste and Odor Control
119604.1020 Powdered Activated Carbon

120

121

SUBPART K: CHEMICAL APPLICATION

122

123Section

124604.1100 General Chemical Application Requirements
125604.1105 Feed Equipment and Chemical Storage
126604.1110 Protective Equipment
127604.1115 Chlorine Gas
128604.1120 Acids and Caustics
129604.1125 Chlorine Dioxide
130604.1130 Sodium Chlorite
131604.1135 Sodium Hypochlorite
132604.1140 Ammonia
133604.1145 Potassium Permanganate
134604.1150 Fluoride

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SUBPART L: PUMPING FACILITIES

137

138Section

139604.1200 General
140604.1205 Pumping Stations
141604.1210 Pumps
142604.1215 Booster Pumps
143604.1220 Automatic and Remote-Controlled Stations
144604.1225 Appurtenances

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SUBPART M: STORAGE

147

148Section

149604.1300 General Storage Requirements
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151604.1310 Access to Water Storage Structures

POLLUTION CONTROL BOARD

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152604.1315 Vents
153604.1320 Level Controls
154604.1325 Roof and Sidewalls
155604.1330 Painting and Cathodic Protection
156604.1335 Treatment Plant Storage
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158604.1345 Hydropneumatic Storage
159604.1350 Combination Pressure Tanks and Ground Storage

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161

SUBPART N: DISTRIBUTION

162

163Section

164604.1400 General Distribution System Requirements
165604.1405 Installation of Water Mains
166604.1410 Materials
167604.1415 System Design
168604.1420 Valves
169604.1425 Hydrants
170604.1430 Air Relief Valves
171604.1435 Valve, Meter and Blow Off Chambers
172604.1440 Sanitary Separation for Finished Water Mains
173604.1445 Sanitary Separation for Raw Water Mains
174604.1450 Surface Water Crossings
175604.1455 Water Service Line
176604.1460 Water Loading Stations

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SUBPART O: CROSS CONNECTIONS

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180Section

181604.1500 Cross Connections
182604.1505 Cross Connection Control Program
183604.1510 Cross Connection Control Device Inspectors
184604.1515 Agency Approved Cross Connection Control Measures
185604.1520 COVID-19 Emergency Provisions (Repealed)

186

187604.TABLE A Steel Pipe

188

~~POLLUTION CONTROL BOARD~~

~~NOTICE OF PROPOSED AMENDMENTS~~

189AUTHORITY: Implementing Section 14-19 and authorized by Section 27 of the Illinois
190Environmental Protection Act [415 ILCS 5/14-19 and 27].

191

192SOURCE: Adopted in R18-17 at 43 Ill. Reg. 8064, effective July 26, 2019; emergency
193amendment in R20-20 at 44 Ill. Reg. 7777, effective April 17, 2020, for a maximum of 150 days;
194amended in R20-21 at 44 Ill. Reg. 14736, effective August 27, 2020; amended in R18-25 at 46
195Ill. Reg. _____, effective _____.

196

197 SUBPART B: SOURCE DEVELOPMENT

198

199Section 604.255 Well Pumps, Discharge Piping and Appurtenances

200

201 a) Where line shaft pumps are used:

202

203 1) the casing must be firmly connected to the pump structure or have the
204 casing inserted into a recess extending at least one-half inch into the pump
205 base;

206

207 2) the pump foundation and base must be at least six inches above the
208 finished floor elevation; and

209

210 3) lubricants must comply with Section 604.105(f).

211

212 b) Where a submersible pump is used:

213

214 1) the top of the casing must be effectively sealed to prohibit the entrance of
215 water under all conditions of vibration or movement of conductors or
216 cables;

217

218 2) the electrical cable must be firmly attached to the riser pipe at 20-foot
219 intervals or less; and

220

221 3) mercury seals must not be used when an existing submersible pump is
222 replaced or a new submersible pump is installed.

223

224 c) Discharge Piping

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226 1) The discharge piping for each well must:

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- A) be designed to minimize friction loss;
 - B) be equipped with a check valve in or at the well, a shutoff valve, a pressure gauge, and a means of measuring flow;
 - C) be protected from the entrance of contamination;
 - D) have control valves and appurtenances located above the pumphouse floor when an above-ground discharge is provided;
 - E) be equipped with a smooth nosed sampling tap at least 18-inches above the floor to facilitate sample collection, located at a point where positive pressure is maintained, but before any treatment chemicals are applied;
 - F) when necessary to remove entrapped air from the well, be equipped with an air release-vacuum relief valve located upstream from the check valve, with exhaust/relief piping terminating in a down-turned position at least 18 inches above the floor and covered with a 24 mesh, corrosion resistant screen;
 - G) be valved to permit test pumping and control of each well;
 - H) have all exposed piping, valves and appurtenances protected against physical damage and freezing;
 - I) be anchored to prevent movement and be supported to prevent excessive bending forces;
 - J) be protected against surge or water hammer; and
 - K) be constructed so that it can be disconnected from the well or well pump to allow the well pump to be pulled.
- 2) The well must have a means of pumping to waste that is not directly connected to a sewer.

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- 3) The discharge, drop or column piping inside the well for submersible, submersible jet and submersible line shaft pumps must:
 - A) be capable of supporting the weight of the submersible pump, piping, water and appurtenances, and of withstanding the thrust, torque, torque fatigue and other reaction loads created during pumping; and
 - B) use lubricants, fittings, brackets, tape or other appurtenances that comply with Section 604.105(f).
- d) Pitless Well Units
 - 1) Pitless units must:
 - A) be shop-fabricated from the point of connection with the well casing to the unit cap or cover;
 - B) be threaded or welded to the well casing;
 - C) be of watertight construction throughout;
 - D) be of materials and weight at least equivalent and compatible to the casing;
 - E) have field connection to the lateral discharge from the pitless unit of threaded, flanged or mechanical joint connection; and
 - F) terminate at least 18 inches above final ground elevation or three feet above the 100-year flood level or the highest known flood elevation, whichever is higher.
 - 2) The design of the pitless unit must make provision for:
 - A) access to disinfect the well;
 - B) a properly constructed casing vent meeting the requirements of subsection [\(c\)](#);

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- C) facilities to measure water levels in the well, under subsection (f);
 - D) a cover at the upper terminal of the well that will prevent the entrance of contamination;
 - E) a contamination-proof entrance connection for electrical cable;
 - F) an inside diameter as great as that of the well casing to facilitate work and repair on the well, pump, or well screen; and
 - G) at least one check valve within the well casing.
- 3) If the connection to the casing is by field weld, the shop-assembled unit must be designed specifically for field welding to the casing. The only field welding permitted will be that needed to connect a pitless unit to the casing.
- e) Casing Vent
- 1) Well casing must be vented to the atmosphere.
 - 2) The vent must terminate in a downturned position, at or above the top of the casing or pitless unit, no less than 12 inches above grade or floor, in a minimum 1½ inch diameter opening covered with a 24 mesh, corrosion resistant screen.
 - 3) The pipe connecting the casing to the vent must be of adequate size to provide rapid venting of the casing.
 - 4) Where vertical turbine pumps are used, vents may be placed into the side of the casing.
- f) Water Level Measurement
- 1) Each well must be equipped with a means for taking water level measurements.

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341 2) Where pneumatic water level measuring equipment is used, it must be
342 made using corrosion-resistant materials attached firmly to the drop pipe
343 or pump column to prevent entrance of foreign materials.
344

345 g) Observation wells must meet the requirements in 77 Ill. Adm. Code 920.170.

346
347 (Source: Amended at 46 Ill. Reg. _____, effective _____)
348

349 SUBPART C: SOURCE WATER PROTECTION PLAN
350

351 **Section 604.315 Source Water Assessment**

352
353 a) The source water assessment must contain the following information:
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- 355 1) statement of the importance of the source water;
356
357 2) a list of water supplies that obtain water from this community water
358 supply;
359
360 3) delineation of all sources of water used by the community water supply,
361 including:
362
363 A) for surface water, description of the watershed, map of the
364 watershed, and intake locations;
365
366 B) for groundwater, the well identification number, well description,
367 well status and well depth; a description of setback zones; and a
368 description of the aquifer for each well;
369
370 4) a report on the quality of the source water for all sources of water
371 delineated in subsection (a)(3), including:
372
373 A) when and where samples used to determine the quality of the
374 source water were taken. These samples must be tested by a
375 certified laboratory; and
376
377 B) the certified laboratory's results;
378

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- 379 5) a report on the quality of the finished water;
- 380
- 381 6) identification of potential sources of contamination to the source water;
- 382
- 383 7) analysis of the source water's susceptibility to contamination; and
- 384
- 385 8) explanation of the community water supply's efforts to protect its source
- 386 water.
- 387

- 388 b) Upon request, the Agency will provide technical assistance to a community water
- 389 supply in conducting the source water assessment.
- 390

391 ~~a)~~c) A community water supply may use a Source Water Assessment Program Fact Sheet

392 prepared by the Agency to fulfill the requirements of this Section.

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394 (Source: Amended at 46 Ill. Reg. _____, effective _____)

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SUBPART E: CLARIFICATION

396

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398 **Section 604.525 Tube or Plate Settlers**

399

- 400 a) Settler units consisting of variously shaped tubes or plates installed in multiple
- 401 layers and at an angle to the flow may be used for sedimentation, following
- 402 flocculation.
- 403
- 404 b) Tube or plate settlers must meet the following requirements:
- 405
- 406 1) Inlet and outlet design must maintain velocities suitable for settling in the
- 407 basin and to minimize short-circuiting;
- 408
- 409 2) Plate units must be designed to minimize maldistribution across the units;
- 410
- 411 3) Drain piping from settler units must be sized to facilitate a quick flush of
- 412 the settlers units and to prevent flooding of other portions of the plant;
- 413
- 414 4) Outdoor installations must be protected against freezing, including
- 415 sufficient freeboard above the top of the settlers;
- 416

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- 417 5) Tubes must have a maximum application rate of 2 gpm per square foot of
418 cross-sectional area, unless higher rates are shown through pilot plant or
419 in-plant demonstration studies;
420
421 6) Plates must have a maximum application rate of 0.5 gpm per square foot,
422 based on 80 percent of the projected horizontal plate area;
423
424 7) Flushing lines must be provided to facilitate maintenance and must be
425 properly protected against backflow or back siphonage;
426
427 8) Inlets and outlets must conform with Section 604.515(b) and (d);
428
429 9) The units' support system must be able to carry the weight of the settler
430 units when the basin is drained plus any additional weight to support
431 maintenance; and
432
433 10) Settler units must accommodate:
434
435 ~~A) A~~ A) A water or air jet system for cleaning their tubes or plates; and
436
437 ~~B) B~~ B) Dropping their water level to allow cleaning with the system
438 identified in subsection (b)(10)(A).
439

440 (Source: Amended at 46 Ill. Reg. _____, effective _____)
441

442 SUBPART F: FILTRATION
443

444 **Section 604.605 Rapid Rate Gravity Filters**
445

- 446 a) The use of rapid rate gravity filters requires pretreatment.
447
448 b) For community water supplies treating surface water, groundwater under the
449 direct influence of surface water, or using lime soda softening treatment, unless
450 otherwise approved by the Agency under Section 604.145(b), the nominal
451 filtration rates must not exceed 3 gal/min/ft² of filter area for single media filters
452 and 5 gal/min/ft² for multi-media filters. Filtration rates must be reduced when
453 treated water turbidity exceeds the standards in 35 Ill. Adm. Code 611.
454

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- 455 c) For community water supplies treating groundwater and not using lime soda
456 softening treatment, unless otherwise approved by the Agency under Section
457 604.145(b), the rate of filtration must not exceed 4 gal/min/ft² of filter area.
458
- 459 d) Number of Filter Units
460
- 461 1) A minimum of two units must be provided. Each unit must be capable of
462 meeting the plant design capacity or the projected maximum daily demand
463 at the approved filtration rate.
464
- 465 2) Where more than two filter units are provided, the filters must be capable
466 of meeting the plant design capacity at the approved filtration rate with
467 one filter removed from service.
468
- 469 3) Where declining rate filtration is provided, the variable aspect of filtration
470 rates and the number of filters must be considered when determining the
471 design capacity for the filters.
472
- 473 e) Structural Details and Hydraulics. The filter structure must be designed to provide
474 for the following:
475
- 476 1) vertical walls within the filter;
477
- 478 2) no protrusion of the filter walls into the filter media;
479
- 480 3) cover by superstructure;
481
- 482 4) head and walking room to permit normal inspection and operation;
483
- 484 5) minimum depth of filter box of 8.5 feet;
485
- 486 6) minimum water depth over the surface of the filter media of 3 feet;
487
- 488 7) trapped effluent to prevent backflow of air to the bottom of the filters;
489
- 490 8) prevention of floor drainage to the filter with a minimum 4-inch curb
491 around the filters;
492

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- 493 9) prevention of flooding by providing overflow;
- 494
- 495 10) maximum velocity of treated water in pipe and conduits to filters of 2
- 496 ft/sec;
- 497
- 498 11) cleanouts and straight alignment for influent pipes or conduits where
- 499 solids loading is heavy, or following lime soda softening;
- 500
- 501 12) construction to prevent cross connections, short-circuiting, or common
- 502 walls between potable and non-potable water; and
- 503
- 504 13) wash water drain capacity to carry maximum flow.
- 505
- 506 f) Wash water troughs must be constructed such that:
- 507
- 508 1) the bottom elevation is above the maximum level of expanded media
- 509 during washing;
- 510
- 511 2) a 2-inch freeboard is provided at the maximum rate of wash;
- 512
- 513 3) the top edge is level and is all at the same elevation;
- 514
- 515 4) troughs are spaced so that each trough serves the same number of square
- 516 feet of filter area; and
- 517
- 518 5) the maximum horizontal travel of suspended particles to reach the trough
- 519 does not exceed 3 feet.
- 520
- 521 g) The filter media must be composed of clean silica sand or other natural or
- 522 synthetic media free from detrimental chemical or bacterial contaminants and
- 523 must meet the following requirements:
- 524
- 525 1) a total depth of not less than 24 inches;
- 526
- 527 2) a uniformity coefficient of the smallest material not greater than 1.65;
- 528
- 529 3) a minimum of 12 inches of media with an effective size range of 0.45 mm
- 530 to 0.55 mm;

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- 4) filter media specifications:
 - A) Filter anthracite must consist of hard, durable anthracite coal particles of various sizes. Blending of non-anthracite material is not acceptable. Anthracite must have:
 - i) an effective size of 0.45 mm to 0.55 mm with uniformity coefficient not greater than 1.65 when used alone;
 - ii) an effective size of 0.8 mm to 1.2 mm with a uniformity coefficient not greater than 1.7 when used as a cap;
 - iii) an effective size less than 0.8 mm for anthracite used as a single media on potable groundwater for iron and manganese removal only (effective sizes greater than 0.8 mm may be approved based upon on site pilot plant studies);
 - iv) a specific gravity greater than 1.4;
 - v) an acid solubility less than 5 percent; and
 - vi) a Moh's scale of hardness greater than 2.7.
 - B) Sand must have:
 - i) an effective size of 0.45 mm to 0.55 mm;
 - ii) a uniformity coefficient of not greater than 1.65;
 - iii) a specific gravity greater than 2.5; and
 - iv) an acid solubility less than 5 percent.
 - C) High density sand must consist of hard, durable, and dense grain garnet, ilmenite, hematite or magnetite, or associated minerals of

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- 568 those ores that will resist degradation during handling and use, and
569 must:
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571 i) contain at least 95 percent of the associated material with a
572 specific gravity of 3.8 or higher;
573
574 ii) have an effective size of 0.2 to 0.3 mm;
575
576 iii) have a uniformity coefficient of not greater than 1.65; and
577
578 iv) have an acid solubility less than 5 percent.
579
580 D) Granular activated carbon as a single media may be considered for
581 filtration only after pilot or full-scale testing and with prior
582 approval of the Agency. The design must include the following:
583
584 ~~i)~~ i) The media must meet the basic specifications for filter media
585 in subsections (g)(1) through (g)(3).
586
587 ii) There must be provisions for a free chlorine residual and
588 adequate contact time in the water following the filters and
589 prior to distribution.
590
591 iii) Provisions must be made for frequent replacement or
592 regeneration.
593
594 E) Other media types or characteristics must be approved by the
595 Agency;
596
597 5) supporting media designed as follows based on the type of filter material:
598
599 A) A three-inch layer of torpedo sand must be used as a supporting
600 media for filter sand where supporting gravel is used, and must
601 have:
602
603 i) an effective size of 0.8 mm to 2.0 mm; and
604
605 ii) a uniformity coefficient not greater than 1.7.

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B) Gravel

- i) When gravel is used as the supporting media, it must consist of cleaned and washed, hard, durable, rounded silica particles and must not include flat or elongated particles.
- ii) The coarsest gravel must be 2.5 inches in size when the gravel rests directly on a lateral system, and must extend above the top of the perforated laterals.
- iii) Not less than four layers of gravel must be provided in accordance with the following size and depth distribution:

Size	Depth
2½ to 1½ inches	5 to 8 inches
1½ to ¾ ^¾ inches	3 to 5 inches
¾ ^¾ to ½ ^½ inches	3 to 5 inches
½ ^½ to 3/16 inches	2 to 3 inches
3/16 to 3/32 inches	2 to 3 inches

- iv) Reduction of gravel depths and other size gradations may be approved by the Agency upon justification for slow sand filtration or when proprietary filter bottoms are specified.

h) Filter Bottoms and Strainer Systems

- 1) Water quality must be reviewed prior to the use of porous plate bottoms to prevent clogging and failure of the underdrain system.
- 2) The design of manifold type collection systems must:
 - A) minimize loss of head in the manifold and laterals;
 - B) ensure even distribution of washwater and even rate of filtration over the entire area of the filter;

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- 644 C) provide the ratio of the area of the strainer systems² final openings
- 645 to the area of the filter at about 0.003;
- 646
- 647 D) provide the total cross-sectional area of the laterals at about twice
- 648 the total area of the final openings;
- 649
- 650 E) provide the cross-sectional area of the manifold at 1.5 to 2 times
- 651 the total area of the laterals; and
- 652
- 653 F) direct lateral perforations without strainers downward.
- 654
- 655 3) The Agency may approve departures from these standards for high rate
- 656 filters and for propriety bottoms.
- 657
- 658 i) The following appurtenances must be provided for every filter:
- 659
- 660 1) influent and effluent sampling taps;
- 661
- 662 2) a gauge indicating loss of head;
- 663
- 664 3) a meter indicating the instantaneous rate of flow;
- 665
- 666 4) a pipe for filtering to waste that has a six inch or larger air gap, or other
- 667 Agency approved cross connection control measure;
- 668
- 669 5) a continuously recording Nephelometer capable of measuring and
- 670 recording filter effluent turbidity at maximum 15-minute intervals, and
- 671 with alarm capability to notify the operator if filtered water turbidity
- 672 exceeds 0.3 NTU (Nephelometric Units);
- 673
- 674 6) an adjustable rate valve to allow the operator to gradually control the flow
- 675 rate increase when placing the filters back into operation; and
- 676
- 677 7) a hose and storage rack for washing filter walls.
- 678
- 679 j) Backwash. Provisions must be made for washing filters as prescribed in this
- 680 subsection.
- 681

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- 682 1) The community water supply must use filtered water provided at the
683 required rate by washwater tanks or a dedicated washwater pump to wash
684 the filters.
685
- 686 2) Backwash rate must meet the following requirements:
687
 - 688 A) a minimum rate of 15 gal/min/ft², consistent with water
689 temperatures and specific gravity of the filter media;
690
 - 691 B) a rate sufficient to provide for a 50 percent expansion of the filter
692 bed; and
693
 - 694 C) a reduced rate of 10 gal/min/ft² for full depth anthracite or granular
695 activated carbon filters, upon approval by the Agency.
696
- 697 3) Washwater pumps in duplicate must be provided unless an alternate
698 means of obtaining washwater is available.
699
- 700 4) The main washwater line must have a regulator or valve to obtain the
701 desired rate of filter wash with the washwater valves on the individual
702 filters open wide.
703
- 704 5) The main washwater line or backwash waste line must have a rate of flow
705 indicator, preferably with a totalizer, located so that it can be easily read
706 by the operator during the washing process.
707
- 708 6) Rapid changes in backwash water flow must be prevented.
709
- 710 7) Backwash must be completed with an operator in attendance to initiate the
711 backwash cycle and to control the return-to-service procedure to assure
712 that the effluent turbidity is less than 0.3 NTU when the filter is placed
713 back into operation for discharge to the clearwell.
714
- 715 8) Appropriate measures for cross connection control must be provided.
716
- 717 k) Surface or subsurface wash facilities are required except for filters used
718 exclusively for iron, radionuclides, arsenic or manganese removal. Wash

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- 719 facilities may include a system of fixed nozzles or a revolving-type apparatus. All
720 devices must be designed:
- 721 1) to provide water pressures of at least 45 psi;
- 722 2) if connected to the treated water system, to prevent back siphonage by
723 properly installing a vacuum breaker or other approved device; and
- 724 3) to provide a rate of flow of 2.0 gpm/ft² of filter area with fixed nozzles or
725 0.5 gpm/ft² with revolving arms.
- 726
- 727
- 728
- 729
- 730 1) Air scouring can be used in place of surface wash if the air scouring meets the
731 following requirements:
- 732
- 733 1) Air flow for air scouring the filter must be 3 to 5 ft³/min/ft² of filter area
734 when the air is introduced in the underdrain; a lower air rate must be used
735 when the air scour distribution system is placed above the underdrains;
- 736
- 737 2) A method to avoid filter media loss during backwashing must be provided;
- 738
- 739 3) Air scouring must be followed by a fluidization wash sufficient to
740 re-stratify the media;
- 741
- 742 4) Air must be free from contamination;
- 743
- 744 5) If air scour distribution systems are placed at the media and supporting
745 bed interface, the air scour nozzles must be designed to prevent media
746 from clogging the nozzles or the air entering the air distribution system;
- 747
- 748 6) Piping for the air distribution system must not be flexible hose or other
749 soft material;
- 750
- 751 7) Air delivery piping must not:
- 752
- 753 A) pass down through the filter media; and
- 754

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- 755 B) have any arrangement in the filter design that would allow
- 756 short-circuiting between the applied unfiltered water and the
- 757 filtered water;
- 758
- 759 8) When air scouring is being utilized, the backwash rate must be variable
- 760 and must not exceed 8 gal/min, unless a higher rate is necessary to remove
- 761 scoured particles from filter media surfaces; and
- 762
- 763 9) Air scouring piping must not be installed in the underdrain unless the
- 764 underdrain was designed to accommodate the piping.
- 765

766 (Source: Amended at 46 Ill. Reg. _____, effective _____)

767 SUBPART G: DISINFECTION

769 **Section 604.735 Chlorinator Piping**

- 771
- 772 a) Cross Connection Protection
- 773
- 774 1) The chlorinator piping must be designed to prevent contamination of the
- 775 treated water.
- 776
- 777 2) For all systems required to disinfect under Section 604.700, piping must
- 778 be arranged to prevent back flow or back siphonage between multiple
- 779 points of chlorine application.
- 780
- 781 3) The water supply to each educator must have a separate shutoff valve.
- 782
- 783 b) Pipe Material
- 784
- 785 1) The pipes carrying elemental liquid or dry gaseous chlorine under pressure
- 786 must be Schedule 80 seamless steel tubing or other materials
- 787 recommended by The Chlorine Institute in Pamphlet 6, Piping Systems for
- 788 Dry Chlorine, incorporated by reference in 35 Ill. Adm. Code 601.115.
- 789 These pipes must not be PVC.
- 790
- 791 2) Rubber, PVC, polyethylene (PE), or other materials recommended by The
- 792 Chlorine Institute must be used for chlorine solution piping and fittings.

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- 3) Nylon products are not acceptable for any part of the chlorine solution piping system.

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART H: SOFTENING

Section 604.805 Cation Exchange Process

- a) Pre-treatment under Section 604.1010(b) or (c) is required when the content of iron, manganese, or a combination of the two is 1 mg/L or more.
- b) Design requirements must provide:
 - 1) automatic regeneration based on volume of water softened; and
 - 2) a manual override on all automatic controls.
- c) The design capacity for hardness removal must not exceed 20,000 grains per cubic foot when resin is regenerated with 0.3 pounds of salt per 1000 grains of hardness removed.
- d) The depth of the exchange resin must not be less than 3 feet.
- e) Flow Rates
 - 1) The rate of softening must not exceed 7 gal/min/ft² of bed area.
 - 2) The backwash rate must be 6 to 8 gal/min/ft² of bed area.
 - 3) Rate of flow controllers or the equivalent must be installed.
- f) The freeboard must be calculated based on the size and specific gravity of the resin and the direction of water flow. Unless otherwise approved by the Agency under Section 604.145(b), the washwater collector must be 24 inches above the top of the resin on down flow units.

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- 831 g) The bottoms, strainer systems and support for the exchange resin must conform to
832 criteria provided for rapid rate gravity filters in Section 604.605(f) and (g).
833
- 834 h) Brine must be evenly distributed over the entire surface of both upflow and
835 downflow units.
836
- 837 i) Backwash, rinse and air relief discharge pipes must be installed to prevent any
838 possibility of back siphonage.
839
- 840 j) Bypass Piping and Equipment
841
- 842 1) ~~1)~~ Bypass must be provided around softening units to produce a blended
843 water of desirable hardness.
844
- 845 2) Totalizing meters must be installed on the bypass line and on each
846 softener unit.
847
- 848 3) The bypass line must have a shutoff valve. An automatic proportioning or
849 regulating device is recommended.
850
- 851 k) When the applied water contains a chlorine residual, the cation exchange resin
852 must be a type that is not damaged by residual chlorine.
853
- 854 l) Sampling Taps
855
- 856 1) Smooth-nosed sampling taps must be provided for the collection of
857 representative samples.
858
- 859 2) The taps must be located to provide for sampling of the softener influent,
860 effluent and blended water.
861
- 862 3) The sampling taps for the blended water must be at least 20 feet
863 downstream from the point of blending.
864
- 865 4) Petcocks are not acceptable as sampling taps.
866
- 867 m) Brine and Salt Storage Tanks
868

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- 869 1) Salt dissolving or brine tanks and wet salt storage tanks must be covered
870 and must be corrosion resistant.
871
- 872 2) The make-up water inlet must be protected from back siphonage. Water
873 for filling the tank must be distributed over the entire surface by pipes
874 above the maximum brine level in the tank. An automatic declining level
875 control system on the make-up water line is recommended.
876
- 877 3) Wet salt storage basins must be equipped with manholes or hatchways for
878 access and for direct dumping of salt from truck or railcar. Openings must
879 be provided with raised curbs and watertight covers having overlapping
880 edges similar to those required for finished water reservoirs.
881
- 882 4) Overflows, where provided, must be protected with corrosion resistant
883 screens and must terminate with either a turned down bend having a
884 proper free fall discharge or a self-closing flap valve.
885
- 886 5) The salt must be supported on graduated layers of gravel placed over a
887 brine collection system.
888
- 889 6) Alternative designs that are conducive to frequent cleaning of the wet salt
890 storage tank may be approved by the Agency.
891
- 892 7) Total salt storage must provide for at least 30 days of operation.
893
- 894 n) Corrosion control must be provided under Subpart I.
895
- 896 o) Suitable disposal must be provided for brine waste.
897
- 898 p) Pipes and contact materials must be resistant to the aggressiveness of salt. Plastic
899 and red brass are acceptable piping materials. Steel and concrete must be coated
900 with a non-leaching protective coating that is compatible with salt and brine.
901
- 902 q) Dry bulk salt storage must be enclosed and separated from other operating areas
903 to prevent damage to equipment.
904

905 (Source: Amended at 46 Ill. Reg. _____, effective _____)
906

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907 SUBPART I: STABILIZATION

908

909 **Section 604.900 General Stabilization Requirements**

910

911 a) Water distributed by community water supplies must be stable so as to not cause a
912 violation of 35 Ill. Adm. Code 601.101(a).

913

914 ~~a)~~b) The following water quality parameters of finished water must be evaluated to
915 ensure that water quality parameters minimize corrosion and minimize deposition
916 of excess calcium carbonate (CaCO₃) scale throughout the distribution system of
917 the community water supply:

918

919 ~~1)~~1) alkalinity (as CaCO₃);

920

921 ~~2)~~2) total hardness (as CaCO₃);

922

923 ~~3)~~3) calcium hardness (as CaCO₃);

924

925 ~~4)~~4) temperature;

926

927 5) pH;

928

929 6) chloride;

930

931 7) sulfate;

932

933 8) total dissolved solids;

934

935 9) oxidation reduction potential;

936

937 10) conductivity;

938

939 11) iron;

940

941 12) manganese;

942

943 13) orthophosphate, if applicable; and

944

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945 14) silica, if applicable.

946

947 ~~b)-c)~~ The following may be used to determine the corrosivity of water distributed by a
948 community water supply:

949

950 ~~1)-1)~~ Lead and Copper

951

952 ~~A)-A)~~ Optimal Corrosion Control Treatment Evaluation Technical
953 Recommendations for Primacy Agencies and Public Water
954 Systems, USEPA (March 2016); Office of Water (4606M); EPA
955 816-B-16-003, incorporated by reference at 35 Ill. Adm. Code
956 601.115;

957

958 B) Chloride Sulfate Mass Ratio (CSMR), calculated as follows:

959

960 ~~CSMR = $\frac{\text{Cl}^-, \text{ expressed as mg/L}}{\text{SO}_4^-, \text{ expressed as mg/L}}$~~

961

962
$$\text{CSMR} = \frac{\text{Cl}^-, \text{ expressed as mg/L}}{\text{SO}_4^-, \text{ expressed as mg/L}}$$

963

964

965 ~~C)-C)~~ Coupon and pipe loop studies.

966

967 ~~2)-2)~~ Iron and Steel
968 Larson-Skold Index (L-SI), calculated as follows:
969

970

971 ~~L-SI = $(\text{Cl} + \text{SO}_4) / \text{alkalinity}$~~
972
$$\text{L-SI} = (\text{Cl} + \text{SO}_4) / \text{alkalinity}$$

973

974 (All parameters expressed as mg/L of equivalent CaCO₃)

975

976 BOARD NOTE: The following equation provides a simplified procedure
977 for calculating L-SI:

978

979 ~~L-SI = $\frac{(1.41)(\text{mg/L Cl}^-) + (1.04)(\text{mg/L SO}_4^{2-})}{\text{mg/L alkalinity (as CaCO}_3)}$~~

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$$LSI = \frac{(1.41)(\text{mg/L Cl}^-) + (1.04)(\text{mg/L SO}_4^{-2})}{\text{mg/L alkalinity (as CaCO}_3)}$$

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Cl⁻ expressed as mg/L chloride
SO₄⁻² expressed as mg/L sulfate

~~3)-3)~~ 3) Iron Steel and Concrete

~~A)-A)~~ A)-A) Calcium Carbonate Precipitation Potential (CCPP), as referenced in Method 2330 C Standard Methods for Examination of Water and Wastewater, 22nd edition, incorporated by reference in 35 Ill. Adm. Code 611.102.

~~B)-B)~~ B)-B) For water containing phosphates:

~~i)-i)~~ i)-i) The Alkalinity Difference Technique, as described in Method 2330 B.3.b and 2330 C.2.b Standard Methods for Examination of Water and Wastewater, 22nd edition, incorporated by reference in 35 Ill. Adm. Code 611.102. The CCPP is the difference between the initial and equilibrated water's alkalinity (or calcium) values, when expressed as CaCO₃.

~~ii)-ii)~~ ii)-ii) The Marble Test, as described in Method 2330 C.2.c Standard Methods for Examination of Water and Wastewater, 22nd edition, incorporated by reference in 35 Ill. Adm. Code 611.102. The Marble Test is similar to the Alkalinity Difference Technique. The CCPP equals the change in alkalinity (or calcium) values during equilibration, when expressed as CaCO₃.

~~e)-d)~~ e)-d) The following may be used to determine deposition of excess CaCO₃ scale:

~~1)-1)~~ 1)-1) CCPP, as referenced in Method 2330 B Standard Methods for Examination of Water and Wastewater, 22nd edition, incorporated by reference in 35 Ill. Adm. Code 611.102.

~~2)-2)~~ 2)-2) For water containing phosphates:

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~~A)~~ A) The Alkalinity Difference Technique, as described in Method 2330 B.3.b and 2330 C.2.b Standard Methods for Examination of Water and Wastewater, 22nd edition, incorporated by reference in Section 611.102. The CCPP is the difference between the initial and equilibrated water's alkalinity (or calcium) values, when expressed as CaCO₃.

~~B)~~ B) The Marble Test as described in Method 2330 C.2.c Standard Methods for Examination of Water and Wastewater, 22nd edition, incorporated by reference in Section 611.102. The Marble Test is similar to the Alkalinity Difference Technique. The CCPP equals the change in alkalinity (or calcium) values during equilibration, when expressed as CaCO₃.

BOARD NOTE: Calcium Carbonate Precipitation Potential (CCPP) can be calculated using Trussell Technologies software:

~~www.trusselltech.com/downloads?category=6~~ www.trusselltech.com/downloads?category=6

CCPP does not apply to protection or corrosion of lead and copper plumbing materials or to water containing phosphates. See "Internal Corrosion and Deposition Control", Water Quality & Treatment, A Handbook on Drinking Water, 6th ed. (2011), American Water Works Association.

BOARD NOTE: Estimating Calcium Carbonate Precipitation Potential (CCPP) using the Alkalinity Difference Technique or the Marble Test, both referenced in Standard Methods for Examination of Water and Wastewater, 22nd edition, incorporated by reference at 35 Ill. Adm. Code 611.102, is described as "Calcium Carbonate Saturation". Simplified Procedures for Water Examination, Manual of Water Supply Practices M12 (5th ed. 2002), American Water Works Association.

Based on results of the "Calcium Carbonate Saturation" test, CCPP can be calculated as:

$$\text{CCPP} = \text{Final mg/L alkalinity (as CaCO}_3\text{)} - \text{Initial mg/L alkalinity (as CaCO}_3\text{)}$$

Water is unsaturated with respect to calcium carbonate and may be corrosive if final alkalinity is greater than initial alkalinity, a positive value in the equation above. If there

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- 1055 is alkalinity gain in the final alkalinity test, it indicates tendency to dissolve calcium
1056 carbonate scale.
1057
1058 Water is oversaturated with calcium carbonate scale and may deposit calcium carbonate
1059 coating in the water mains if final alkalinity is less than initial alkalinity, a negative value
1060 in the equation above. If there is alkalinity loss in the final alkalinity test, it indicates
1061 tendency to precipitate calcium carbonate scale. If final and initial alkalinity are the
1062 same, the water is stable and in equilibrium with calcium carbonate.
1063
1064 CCPP is not applicable to protection or corrosion of lead and copper plumbing materials.
1065
1066 Verifying the alkalinity titration endpoint by using a pH meter to verify the pH of the
1067 titrated alkalinity sample is recommended, since titration endpoint visual color change
1068 may be individually variable. If pH of the sample is not certain, consider using pH of
1069 4.50 to represent the endpoint. See "Alkalinity Test", Standard Methods for Examination
1070 of Water and Wastewater, 22nd edition, incorporated by reference in 35 Ill. Adm. Code
1071 611.102.
1072
1073 e) Acceptable stability treatments include:
1074
1075 1) carbon dioxide addition;
1076
1077 2) acid addition;
1078
1079 3) phosphate addition;
1080
1081 4) split treatment;
1082
1083 5) alkali chemical:
1084
1085 ~~A) A~~ hydrated lime
1086
1087 ~~B) B~~ sodium carbonate
1088
1089 ~~C) C~~ sodium bicarbonate
1090
1091 ~~D) D~~ sodium hydroxide;
1092

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- 1093 6) carbon dioxide reduced by aeration;
- 1094
- 1095 7) calcium hydroxide; and
- 1096
- 1097 8) sodium silicate addition.
- 1098
- 1099 f) When chemical addition is used for stabilization, the community water supply
- 1100 must comply with requirements of Subpart K.
- 1101

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART J: OTHER TREATMENT

Section 604.1005 Anion Exchange

- 1107
- 1108 a) Pre-treatment Requirements. Pre-treatment under Section 604.1010 is required
- 1109 when a combination of iron and manganese exceeds 0.5 mg/L.
- 1110
- 1111 b) Anion Exchange Treatment Design
- 1112
- 1113 1) Automatic regeneration based on volume of water treated must be used
- 1114 unless manual regeneration is justified and is approved by the Agency.
- 1115
- 1116 2) If a portion of the water is bypassed around the units and blended with
- 1117 treated water, the following requirements must be met:
- 1118
- 1119 A) the maximum blend ratio allowable must be determined based on
- 1120 the highest anticipated raw water nitrate level; and
- 1121
- 1122 B) a totalizing meter and a proportioning or regulating device or flow
- 1123 regulating valves must be provided on the bypass line.
- 1124
- 1125 3) A manual override must be provided on all automatic controls.
- 1126
- 1127 4) Adequate freeboard must be provided to accommodate the backwash flow
- 1128 rate of the unit, ensuring the resin will not overflow. The freeboard must
- 1129 be calculated based on the size and specific gravity of the resin.
- 1130

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- 1131 5) The system must be designed to include an adequate under drain and
1132 supporting gravel system and brine distribution equipment.
- 1133
- 1134 6) Sampling Taps
- 1135
- 1136 A) Smooth-nosed sampling taps must be provided for the collection of
1137 representative samples.
- 1138
- 1139 B) The taps must be located to provide for sampling of the softener
1140 influent, effluent and blended water.
- 1141
- 1142 C) The sampling taps for the blended water must be at least 20 feet
1143 downstream from the point of blending.
- 1144
- 1145 D) Petcocks are not acceptable as sampling taps.
- 1146
- 1147 7) Brine and Salt Storage Tanks
- 1148
- 1149 A) Salt dissolving or brine tanks and wet salt storage tanks must be
1150 covered and must be corrosion resistant.
- 1151
- 1152 B) The make-up water inlet must be protected from back siphonage.
1153 Water for filling the tank must be distributed over the entire
1154 surface by pipes above the maximum brine level in the tank. An
1155 automatic declining level control system on the make-up water line
1156 is recommended.
- 1157
- 1158 C) Wet salt storage basins must be equipped with manholes or
1159 hatchways for access and for direct dumping of salt from truck or
1160 railcar. Openings must be provided with raised curbs and
1161 watertight covers having overlapping edges similar to those
1162 required for finished water reservoirs.
- 1163
- 1164 D) Overflows, where provided, must be protected with corrosion
1165 resistant screens and must terminate with either a turned downward
1166 bend having a proper free fall discharge or a self-closing flap
1167 valve.
- 1168

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- 1169 E) The salt must be supported on graduated layers of gravel placed
1170 over a brine collection system.
1171
- 1172 F) Alternative designs that are conducive to frequent cleaning of the
1173 wet salt storage tank may be approved by the Agency.
1174
- 1175 G) Total salt storage must provide for at least 30 days of operation.
1176
- 1177 c) Exchange Capacity. The design capacity for nitrate removal must not exceed
1178 10,000 grains per cubic foot when the resin is regenerated at 15 pounds of salt per
1179 cubic foot of resin.
1180
- 1181 d) Number of Units. At least two units must be provided. The treatment capacity
1182 must be capable of producing the maximum average daily demand at a level
1183 below the nitrate/nitrite MCL, with one exchange unit out of service.
1184
- 1185 e) Type of Media. The anion exchange media must be of the nitrate selective type.
1186
- 1187 f) Flow Rates. Unless otherwise approved by the Agency under Section 604.145(b),
1188 the following flow rates apply:
1189
- 1190 1) The treatment flow rate must not exceed 5 gal/min/ft² of bed area.
1191
- 1192 2) The backwash flow rate must be between 4.0 and 6.0 gal/min/ft² of bed
1193 area.
1194
- 1195 3) The regeneration rate must be approximately 1.0 gal/min/ft² of bed area
1196 with a fast rinse approximately equal to the service flow rate.
1197
- 1198 g) Cross Connection Control. Backwash, rinse and air relief discharge pipes must be
1199 installed to prevent any possibility of back-siphonage.
1200
- 1201 h) Construction Materials. Pipes and contact materials must be resistant to the
1202 aggressiveness of salt. Plastic and red brass are acceptable materials. Steel and
1203 concrete must be coated with a non-leaching protective coating that is compatible
1204 with salt and brine.
1205

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- 1206 i) Housing. Dry bulk salt storage must be enclosed and separated from other
1207 operating areas to prevent damage to equipment.
1208
1209 j) Preconditioning of the Media. Prior to startup of the equipment, the media must
1210 be regenerated with no less than two bed volumes of water containing sodium
1211 chloride followed by an adequate rinse.
1212

1213 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1214

1215 **Section 604.1010 Iron and Manganese Control**

- 1216
1217 a) Except as provided in 35 Ill. Adm. Code 611.300(e), treatment is required to
1218 meet the iron and manganese MCL as stated in Section 611.300(b).
1219
1220 b) Removal of Iron and Manganese by Oxidation, Detention and Filtration
1221
1222 1) Oxidation must be by aeration, as indicated in Subpart D, unless the
1223 community water supply demonstrates chemical oxidation provides
1224 equivalent results to aeration. Chemicals that may be used for oxidation
1225 include chlorine, sodium permanganate, potassium permanganate, ozone
1226 or chlorine dioxide.
1227
1228 2) Detention
1229
1230 A) A minimum detention time of 30 minutes must be provided
1231 following aeration to ensure that the oxidation reactions are
1232 complete prior to filtration. This minimum detention time may be
1233 modified only when a pilot plant study indicates completion of
1234 oxidation reactions in less time.
1235
1236 B) The reaction tank/detention basin must be provided with an
1237 overflow, vent and access hatch in accordance with Subpart M.
1238
1239 3) Filtration. Filters must conform to Subpart F.
1240
1241 c) Removal by Manganese Greensand or Manganese Coated Media Filtration
1242

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- 1243 ~~1)~~ 1) Permanganate or chlorine must be added to the water upstream of the filter,
1244 per manufacturer's recommendation.
1245
1246 2) An anthracite media cap of at least six inches must be provided over
1247 manganese greensand.
1248
1249 3) Normal backwash rate is 8 gal/min/ft² with filters containing manganese
1250 greensand and 15 gal/min with manganese coated media.
1251
1252 4) Sample taps must be provided:
1253
1254 A) prior to application of permanganate;
1255
1256 B) immediately ahead of filtration;
1257
1258 C) at points between the anthracite media and the manganese
1259 greensand;
1260
1261 D) halfway down the manganese greensand; and
1262
1263 E) at the filter effluent.
1264
1265 d) Sequestration of Iron and/or Manganese by Polyphosphates
1266
1267 1) Sequestration by polyphosphates must not be used when the combination
1268 of iron and manganese exceeds 1 mg/L.
1269
1270 2) Phosphate solution must be kept covered and disinfected by carrying
1271 approximately 10 mg/L free chlorine residual unless the phosphate is not
1272 able to support bacterial growth and the phosphate is being fed from the
1273 covered shipping container. Phosphate solutions having a pH of 2.0 or
1274 less may also be exempted from this requirement by the Agency.
1275
1276 3) Polyphosphates must not be applied ahead of iron and manganese removal
1277 treatment. The point of application must be prior to aeration, oxidation or
1278 disinfection.
1279

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- 1280 4) The phosphate feed point must be located as far ahead of the oxidant feed
1281 point as possible.
1282
- 1283 e) Sequestration of Iron and/or Manganese by Sodium Silicates:
1284
- 1285 1) Sequestration by sodium silicate must not be used when iron, manganese
1286 or a combination of iron and manganese exceeds 2 mg/L.
1287
- 1288 2) A full-scale demonstration will be required to determine the suitability of
1289 sodium silicate for the particular water and the minimum feed needed.
1290
- 1291 3) Chlorine or chlorine dioxide addition must accompany the sodium silicate
1292 addition.
1293
- 1294 4) Sodium silicate must not be applied ahead of iron or manganese removal
1295 treatment.
1296

1297 (Source: Amended at 46 Ill. Reg. _____, effective _____)
1298

1299 **SUBPART K: CHEMICAL APPLICATION**
1300

1301 **Section 604.1105 Feed Equipment and Chemical Storage**
1302

- 1303 a) Solution Feed Equipment
1304
- 1305 1) Corrosion resistant containers must be provided for solution feeders.
1306
- 1307 2) Containers must have non-corrodible covers with overhanging edges.
1308 Openings must be constructed to prevent contamination.
1309
- 1310 3) Scales or a volumetric measuring device must be provided for determining
1311 the amount of solution fed.
1312
- 1313 b) Feeder Redundancy
1314
- 1315 1) When chemical feed is necessary for the protection of the supply, such as
1316 chlorination, coagulation or other essential processes:
1317

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- 1318 A) a minimum of two feeders must be provided with each having
1319 adequate capacity to provide the maximum dosage necessary; and
1320
1321 B) the standby unit or a combination of units of sufficient size to meet
1322 capacity must be provided to replace the largest unit when out of
1323 service.
1324
1325 2) A separate feeder must be used for each chemical applied.
1326
1327 3) Each chemical feeder and day tank must be identified with its content.
1328
1329 4) Spare parts must be available on site for all feeders and chemical booster
1330 pumps to replace parts that are subject to wear and damage.
1331
1332 c) Control
1333
1334 1) At automatically operated facilities:
1335
1336 A) The automatic controls must be designed to allow override by
1337 manual controls.
1338
1339 B) Chemical feeders must be electrically interconnected with the well
1340 or service pump so that they will not operate if the well or service
1341 pump is not operating.
1342
1343 2) Chemical feed rates must be proportional to the flow stream to achieve the
1344 appropriate dose of chemical application.
1345
1346 3) A means to measure water flow stream being dosed must be provided to
1347 determine chemical feed rates.
1348
1349 4) Provisions must be made for measuring the quantities of chemicals used.
1350
1351 5) Weighing Scales
1352
1353 A) Weighing scales must be capable of providing reasonable precision
1354 in relation to average daily dose.
1355

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- 1356 B) Unless otherwise approved by the Agency under Section
1357 604.145(b), treatment chemicals in gaseous state must be weighed;
1358
1359 C) Fluoride solution fed from supply drums or carboys must be
1360 weighed; and
1361
1362 D) Volumetric dry chemical feeders must be weighed unless
1363 otherwise approved by the Agency under Section 604.145(b).
1364
1365 d) Dry chemical feeders must:
1366
1367 1) measure chemicals volumetrically or gravimetrically;
1368
1369 2) provide adequate water and agitation of the chemical within the slurry
1370 tank; and
1371
1372 3) completely enclose chemicals to prevent emission of dust to the operating
1373 room.
1374
1375 e) Positive Displacement Solution Pumps
1376
1377 ~~1)~~ 1) Positive displacement type solution feed pumps may be used to feed liquid
1378 chemicals, but must not be used to feed chemical slurries.
1379
1380 2) Pumps must be capable of operating at the required maximum rate against
1381 the maximum head conditions found at the point of injection.
1382
1383 3) Calibration tubes or mass flow monitors that allow for direct physical
1384 measurement of actual feed rates must be provided.
1385
1386 f) To ensure that chemical solutions cannot be siphoned or overfed into the water
1387 supply, liquid chemical feeders must:
1388
1389 1) assure discharge at a point of positive pressure;
1390
1391 2) provide vacuum relief; or
1392
1393 3) provide a suitable air gap or anti-siphon device.

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- 1394
1395 g) Cross connection control must be provided to assure that:
1396
1397 1) the make-up water lines discharging to liquid storage tanks must be
1398 properly protected from backflow;
1399
1400 2) no direct connection exists between any sewer and a drain or overflow
1401 from a chemical feed system; and
1402
1403 3) all overflows and drains from a chemical field system must have an airgap
1404 above the sewer or overflow rim of a receiving sump.
1405
1406 h) Chemical feed equipment location must be readily accessible for servicing, repair
1407 and observation of operation.
1408
1409 i) Make-up-water lines must be:
1410
1411 1) obtained from the finished water supply, or from a location sufficiently
1412 downstream of any chemical feed point to assure adequate mixing; and
1413
1414 2) ample in quantity and adequate in pressure.
1415
1416 j) Storage of Chemicals
1417
1418 1) Space must be provided for:
1419
1420 A) at least 30 days of chemical supply;
1421
1422 B) convenient and efficient handling of chemicals;
1423
1424 C) dry storage conditions; and
1425
1426 D) a minimum storage volume of 1.5 times the gross shipping
1427 volume.
1428
1429 2) Offloading areas must be clearly labeled to prevent accidental
1430 cross-contamination.
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- 1432 3) Chemicals must not be stored in confined spaces.
- 1433
- 1434 4) Chemicals must be stored in covered or unopened shipping containers,
- 1435 unless the chemical is transferred into an approved storage unit.
- 1436
- 1437 5) Feed equipment and storage chemicals must be stored inside a building
- 1438 unless otherwise approved by the Agency under Section 604.145(b).
- 1439
- 1440 6) Liquid chemical storage tanks must have a liquid level indicator.
- 1441
- 1442 7) Secondary Containment
- 1443
- 1444
- 1445 A) Liquid chemical storage tanks must have secondary containment
- 1446 consisting of an overflow and a receiving basin capable of
- 1447 receiving accidental spills or overflows without uncontrolled
- 1448 discharge.
- 1449
- 1450 B) A common receiving basin may be provided for each group of
- 1451 compatible chemicals that provides sufficient containment volume
- 1452 to prevent accidental discharge in the event of failure of the largest
- 1453 tank. Groups of compatible chemicals are as follows: acids,
- 1454 bases, salts and polymers, absorption powders, oxidizing powders
- 1455 and compressed gases.
- 1456
- 1457 8) Vents from storage tanks must have a corrosion resistant 24 mesh screen.
- 1458
- 1459 k) Bulk Liquid Storage Tanks
- 1460
- 1461 1) A uniform strength of chemical solution must be maintained. Continuous
- 1462 agitation must be provided to maintain slurries in suspension.
- 1463
- 1464 2) A means to assure continuity of chemical supply must be provided.
- 1465
- 1466 3) Means must be provided to measure the liquid level in the tank.
- 1467
- 1468 4) Liquid storage tanks including any access openings must be kept securely
- 1469 covered.

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- 5) Overflow pipes, when provided, must:
 - A) be turned downward, with the end screened;
 - B) have a free fall discharge; and
 - C) be located where noticeable.
- 6) Liquid storage tanks must be vented, but not through vents in common with other chemicals or day tanks.
- 7) Each liquid storage tank must be provided with a valved drain in accordance with subsection (g).
- 8) Solution tanks must be located, and protective curbing provided, so that chemicals from equipment failure, spillage or accidental drainage do not enter the water in conduits, treatment or storage basins. Chemicals must be stored as required by subsection (j)(5).
- l) Day Tanks
 - 1) Day tanks must be provided where bulk storage of liquid chemical is provided.
 - 2) Day tanks must meet all the requirements of subsection (k), except that shipping containers do not require overflow pipes and subsection drains.
 - 3) Day tanks must be scale-mounted, or have a calibrated gauge painted or mounted on the side if liquid level can be observed in a gauge tube or through translucent sidewalls of the tank. In opaque tanks, a gauge rod may be used. The ratio of the area of the tank to its height must be such that unit readings are meaningful in relation to the total amount of chemical fed during a day.
 - 4) Except for fluosilicic acid, hand pumps may be provided for transfer from a shipping container. When motor-driven transfer pumps are provided, a liquid level limit switch must be provided.

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- 5) Tanks and tank refilling line entry points must be clearly labeled with the name of the chemical contained.

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- 6) Filling of day tanks must not be automated.

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- m) Feed lines must be:

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- 1) of durable, corrosion-resistant material;

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- 2) protected against freezing;

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- 3) designed to prevent clogging; and

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- 4) color coded and labeled in accordance with Section 604.120.

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- n) Handling. Provision must be made for the proper transfer of dry chemicals from shipping containers to storage bins or hoppers, in such a way as to minimize the quantity of dust that may enter the room.

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- o) Housing

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- 1) Floor surfaces must be smooth and impervious, slip-proof and well drained.

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- 2) Vents from feeders, storage facilities and equipment exhaust must discharge to the outside atmosphere above grade and remote from air intakes.

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(Source: Amended at 46 Ill. Reg. _____, effective _____)

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SUBPART M: STORAGE

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1541 Section 604.1350 Combination Pressure Tanks and Ground Storage

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1543 A combination of ground storage, hydropneumatic storage and pumps may be considered in
1544 water systems for maintaining pressure on the distribution system. Design of such a system must
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- a) a minimum ground storage volume equivalent to 1.5 times the average daily usage;
- b) a minimum of two pumps, each capable of meeting the peak hourly flow provided in Section 604.115(d). If more than two pumps are proposed, the peak hourly flow must be met when any pump is out of service;
- c) an electric generator with automatic start capable of providing power to pumps that can produce the peak hourly flow provided in Section 604.115(d), plus sufficient power to operate all chemical feeders, appurtenances and equipment essential to plant operation. Consideration must be given to sizing the generator to provide power for at least one well; and
- d) a hydropneumatic tank sized to provide service for a minimum of 10 minutes under the peak hourly flow provided in Section 604.115(d).

(Source: Amended at 46 Ill. Reg. _____, effective _____)

SUBPART O: CROSS CONNECTIONS

Section 604.1510 Cross Connection Control Device Inspectors

- a) Except as provided in subsection (c), cross connection control devices must be inspected at least annually by a person approved by the Agency or its designee as a cross connection control device inspector (CCCDI). The inspection of mechanical devices must include physical testing in accordance with the manufacturer's instructions.
 - 1) Records of the annual inspection must be submitted to the community water supply.
 - 2) Each device inspected must have a tag attached listing the date of the most recent test, name of CCCDI, and type and date of repairs.
 - 3) A maintenance log must be maintained at the site of installation and must include:

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- ~~A)~~ A) make, model and serial number of the backflow preventer, and its location at the site;
 - B) date of each test;
 - ~~C)~~ C) name and approval number of person performing the test;
 - ~~D)~~ D) type of test kit used and date of its most recent calibration;
 - E) test results and a brief statement indicating whether the results pass or fail the test;
 - F) repairs or servicing required;
 - G) repairs and date completed; and
 - H) servicing performed and date completed.
- b) Requirements for Cross Connection Control Device Inspector Approval
- 1) Each applicant for CCCDI Approval must:
 - A) be a person authorized to perform plumbing as described in the Illinois Plumbing License Law [225 ILCS 320/3(1)].
 - B) complete a training course offered by the Environmental Resources Training Center (see 110 ILCS 530) or the Agency's delegate on cross connection control device that includes hands on practice testing of different types of backflow devices and proper maintenance and repair.
 - C) complete and submit an application for CCCDI Approval.
 - D) successfully complete both written and performance examinations demonstrating competency in the following: the principles of backflow and back-siphonage; the hazard presented to a potable

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- 1622 water system; locations that require installation of
1623 cross-connection control devices; identifying, locating, inspecting,
1624 testing, maintaining and repairing cross-connection control
1625 methods and devices in-line, as located throughout each system
1626 that connects to a community public water supply. The applicant
1627 must successfully complete:
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1629 i) the written examination with a minimum score of 75%; and
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1632 ii) a performance-based examination by demonstrating
1633 competency in testing device procedures on all types of
1634 devices at the examination center.
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1637 2) CCCDIs must renew the CCCDI Approval each year between May 1 and
1638 June 30. An application for CCCDI renewal will be sent by the Agency or
1639 its designee, and must be completed and returned by June 30 of the
1640 renewal year. CCCDIs must complete an eight-hour recertification course
1641 every three years from the date of the original issuance of the CCCDI
1642 license. The course must be offered by the Environmental Resources
1643 Training Center or the Agency's delegate and include a written and
1644 practical exam demonstrating competency in backflow prevention testing.
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1647 3) A CCCDI Approval or admission to examination for CCCDI Approval
1648 must be suspended, revoked or not issued by the Agency for any one or
1649 more of the following causes:
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1652 A) Practice of any fraud or deceit in obtaining or attempting to obtain
1653 a CCCDI Approval, including misrepresentation of approval;
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1656 B) Any repeated, flagrant or willful negligence or misconduct in the
1657 inspection, testing or maintenance of cross connection control
1658 devices;
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- C) Falsification of reports required by this Part;

- D) Willful violation of the Environmental Protection Act or any rules adopted under it.

- 4) Suspension and Revocation Procedures
 - A) Any person may file with the Agency a written complaint regarding the conduct of a CCCDI approved under this Part. The complaint must state the name and address of the complainant, the name of the CCCDI, and all information that supports the complaint.

 - B) The Agency may initiate the suspension or revocation procedure on the basis of any written complaint or on its own motion. The Agency's decision to institute suspension or revocation proceedings will be based on the seriousness of the violation and its potential deleterious impact upon public health and safety.

 - C) When the suspension or revocation procedure is initiated, the Agency must notify the CCCDI by certified mail that suspension or revocation is being sought. The notice must specify the cause upon which suspension or revocation is sought and include the procedures for requesting a hearing before the Agency. Request for hearing must be made in writing within 14 days after receipt of the Agency's certified notification. If no hearing is requested, the Agency will suspend or revoke the CCCDI Approval.

 - D) Should a hearing be requested, the Director must appoint one or more Agency employees to chair the proceedings. The hearing must be conducted according to the hearing requirements of 35 Ill. Adm. Code 168.

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- 1697 E) The Director must make a decision within 30 days after receiving
- 1698 the hearing transcript. The Director must give written notice of
- 1699 that decision and reasons for the decision to the CCCDI by
- 1700 certified mail.
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- 1702 F) Within 30 days after receiving a notice of suspension or revocation
- 1703 from the Agency, the CCCDI may appeal the suspension or
- 1704 revocation to the Pollution Control Board. The suspension or
- 1705 revocation of the CCCDI's Approval must be stayed pending a
- 1706 final decision on the appeal by the Board.
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- 1708 c) Backflow preventers located in the treatment plant, wellhouse or booster station
- 1709 of a community public water supply facility must be inspected at least annually by
- 1710 either an approved CCCDI or by a certified water supply operator who has
- 1711 completed the qualifications listed in subsections (b)(1)(B) and (D).
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- 1714 1) When the inspection is conducted by a certified water supply operator who
- 1715 has completed the necessary qualifications, records must be kept as
- 1716 required by subsection (a)(3).
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- 1719 2) Each device inspected must have a tag attached listing the date of the most
- 1720 recent test, name of the CCCDI, and type and date of repairs.
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(Source: Amended at 46 Ill. Reg. _____, effective _____)

1724 Section 604.1520 COVID-19 Emergency Provisions (Repealed)

(Source: Repealed at 46 Ill. Reg. _____, effective _____)

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