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December 12, 2011

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WATER QUALITY DIVISION
TCEQ

Texas Commission on Environmental Quality
Mr. Louis Herrin, III, P.E.
P.O. Box 13087
Austin, Texas 78711-3087 – **MC 148**

Re: Review Comments on Chapter 217
Design Criteria for Sewerage Systems

Dear Mr. Herrin:

The Houston Council of Engineering Companies (HCEC), a business association representing over 100 civil, structural, geotechnical and MEP engineering firms in the Houston metropolitan area, would like to submit to you our comments on Chapter 217.

On October 31st one of our members, Mr. Tobin Synatschk of Jones & Carter, Inc., submitted a set of draft comments to you. Since that time we have refined our comments and now submit a final version. We are submitting them in a redline version so that it is easier for you to see what may have changed or been added since our first submittal.

We thank you for allowing us the opportunity to bring forward to you proposed changes that we feel will be an improvement to the current design criteria and help in the protection of the health, safety and welfare of the citizens of Texas.

If you have any questions, or need to meet with us to go over our comments, please do not hesitate to call me at 713-426-0800, or Mr. Tobin Synatschk at 713-777-5337. In addition, we are also asking our state organization, the American Council of Engineering Companies-Texas to keep track of this process. Mr. Steve Stagner, President, or Mr. Peyton McKnight, General Counsel at 512-474-1474 may also be attending any future meetings on this matter on our behalf.

Sincerely,

Christina M. Lindsay
Executive Director

Enclosure

Cc: Steve Stagner, President, ACEC-TX
Peyton McKnight, General Counsel, ACEC-TX

HOUSTON COUNCIL OF ENGINEERING COMPANIES

DESIGNING THE FUTURE OF HOUSTON

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Rule		Proposed Change	Concern
217.32(a)(1)(B)	Organic Loadings and Flows	For a facility less than 1.0 mgd, the ***design*** flow is the maximum 30-day average flow estimated by multiplying the average annual flow by a factor of at least 1.5.	Permitted flow is defined by the discharge permit. The design flow should be calculated by this method when determining the flow requested in permit.
217.32(a)(3) Table B.1	Organic Loadings and Flows	Under the "Municipality" and "Subdivision" section, revise "Wastewater Strength" to ***235-350***	Increase the minimum value do to noticed increases in concentrations across the Board. Plants designed at 200 mg/L are commonly seeing organic capacity issues prior to next hydraulic expansion.
217.33 (c)(2)(A)	Flow Measurement	A channel approach section to a weir ***should*** be straight for at least 20 times the maximum expected head on a weir.	On smaller plants, typically a larger weir to lower head loss and enable compliance. A larger weir limits accuracy of flow measurement. The accuracy added by this rule is lost with the resulting changes on smaller plants. ISCO flow manual uses the word should in their recommendations.
217.36(c)(3)	Emergency Power Revisions	Any offsite lift station must ***follow the requirements in section 217.63.***	The requirements for an offsite lift station in this section differ from the requirements for offsite lift station in 217.63. This section requires generators as the only auxiliary option.
217.36(c)(3)	Emergency Power Revisions	If storage is used in lieu of backup power generators, the report must show the hydraulic grade line of a collection system is such that in no case will wastewater be allowed to bypass the treatment facility for a flow event equal to the longest outage in the power records. **Peak flow rates shall be used for outages up to 2 hours. Outages longer than 2 hours shall use peak flow rates for the first 2 hours and average flow rates for all additional outage time.**	Peak flows are defined and handled at plant for a maximum of 2 hours. Many of longest outages are in far excess of 2 hours.
217.36(d)(1)(B)	Emergency Power Revisions	Delete subsection (2) under subsection (d)	This subsection is not required with the above proposed rule change. These rules are not consistent with other offsite rules in section 217.63.
217.58(b)(2)(H)	Testing Requirements for Manholes	Will utilize ASTM testing requirements for manholes	Any uncoated manhole cannot meet this requirement.

217.59(b)(3)	Lift Station Site Requirements	An intruder-resistant fence must use a minimum of a 6.0 feet high chain link, masonry, board fence ***or other ornamental fence*** *with at least three strands of barbed wire or 8.0 feet high chain link, masonry, board* ***or other ornamental fence.***	Want to ensure other ornamental, intruder resistant fences may be used. On fences of 8 feet, do not want barbed wire for aesthetic in neighborhoods where detracts from surrounding appearance. Additional height should be equivalent to six foot with 3 strand barb requirement
217.59(c) 217.60(b)(6)	Flood Protection Lift Station, Wet Well and Dry Well Designs	Delete the words "and operate during". ***If not contained within an intruder resistant fence, all operating equipment and valves should be secured and tamper proof, below or above ground. Above ground valves located within the confines of an intruder resistant fence, but not enclosed in a structure, must be chained and locked to prevent unauthorized operation.***	This requirement is unrealistic along the coast. Enable aboveground lockable enclosure. Clarifying what is allowed by this rule.
217.62(b)(1)(A)	Lift Station Pipes	A check valve must be a swing type valve with ***an external position indicator.***	Current rule requires swing levers. Doesn't allow all types of swing valves such as a '"Surge Buster"
217.63(d)(1)(A)	Emergency Provisions for Lift Stations	The retention capacity in a lift station's wet well and incoming gravity pipes must prevent discharges or untreated wastewater at the lift station or any point upstream for a period of time equal to the longest electrical outage recorded during the past 24 months, but not less than 20 minutes. ***Peak flow rates shall be used for outages up to 2 hours. Outages longer than 2 hours shall use peak flow rates for the first 2 hours and average flow rates for all additional outage time.***	Match sizing criteria at wastewater treatment plants in prior section, 217.36.

217.63(d)(2)(A)	Emergency Provisions for Lift Stations	On Site Generators ***and Auxiliary Pumps*** . A lift station may be provided emergency power by on-site, automatic electrical generators ***or on-site engine driven automatic pump*** sized to operate the lift station at its firm pumping capacity or at the average daily flow, if the peak flow can be stored in the collection system.	Allow the use of engine driven auxiliary pumps in lieu of generators.
217.63(d)(3)(C)	Emergency Provisions for Lift Stations	The size of a portable generator ***or auxiliary pump*** must handle the firm pumping capacity of the lift station ***or the capacity determined in 217.63(d)(2).***	Allow the use of portable auxiliary pumps in lieu of [portable generators and to allow capacity sizing to be average flow rates if the peak rates can be stored in the collection system.
217.63(d)(3)(D)	Portable Generators and Pumps	Fuel tanks shall be sized for 24 hours of continuous running.	
217.63(d)(4)	Emergency Provisions for Lift Stations	Add a section (4) for Gravity Relief Sewers.	Allow the use of gravity relief sewers as an overflow prevention design.
217.67(a)(3)(A)	Force main Velocities	Change "in operation" to "at full speed".	This rule currently limits the usefulness of VFDs.
217.69(h)(1)(A)	Reclaimed Water Facilities	All electrical equipment must be **protected** from potential flooding from a wet well and flooding.	Not require operation during 100-yr. This system is not necessary during flood events.
217.69(h)(3)(B)	Reclaimed Water Facilities	A check valve must be a swing type valve with ***an external position indicator.***	Current rule requires swing levers. Doesn't allow all types of swing valves such as a '"Surge Buster"
217.121	Coarse Screening Devices	Add a section to not require a screening device if all glow entering the plant is pumped with grinder pumps.	A coarse screen does not do anything with ground solids.
217.152(d)(3)	Requirements for Clarifiers	***The flow velocity in a sludge pipe must be greater than 0.5 feet per second and should be greater than 2.0 feet per second where possible.***	This section could also be deleted. On small plants with small clarifiers, this requirement cannot be met with a 4-inch diameter pipe. The 4-inch pipe is a better rule to keep than the velocity rule.
217.152(g)(2)	Requirements for Clarifiers	Add a max clarifier diameter for 10' min. SWD and a 12' min SWD section for clarifiers	10' minimum is a poor design value on larger clarifiers. The cutoff point needs to be determined from models/calculations/discussion with vendors.

217.153(c)(2)	Requirements for both Aeration Basins and Clarifiers	This should be clarified as only requirement hydraulic overflows to be prevented and that it does not require oversized treatment basins	If loading criteria for treatment are maintained it makes very oversized basins which makes treatment difficult at under loaded plants.
217.155 (a)(2)	Aeration Sizing Equipment	Mechanical and diffusers aeration system must supply the O2R calculated by Equation F.2 located in paragraph (3) of this subsection or use the recommend values presented in Table F.3 in paragraph (3) of this subsection, ***whichever is greater.***	Clarify design oxygen needs but set a conservative minimum for high ammonia plants on O2R requirements
217.155 (a)(2)	Aeration Sizing Equipment	Units on Equation F.2 are incorrect	Need to revise units to be consistent.
217.155 (b)(2)(A)(iii)	Aeration Sizing Equipment	Delete the existing section and create a table showing max allowed % Transfer efficiency at depths varying from 7-22 feet for coarse and fine bubble.	The percent value maximums are dependent on depth. Equipment is capable of producing transfer efficiencies far in excess of these values in deeper tanks. Since manufacturers are required to provide testing lab data to support their equipment, these values are protected from the use of different manufacturers.
217.155 (b)(2)(D)Table F.5(iii)	Aeration Sizing Equipment	***Footnote: Correction factors shall not be used if manufacturer laboratory testing data is provided at the exact diffuser submergence depth of the design.***	Actual test data I better since equipment and testing procedures can improve in time.
217.155 (b)(4)(B)	Aeration Sizing Equipment	Replace "actual air requirements" with "maximum air requirements".	Designing for the maximum is worst case.
217.155 (b)(5)(A)(II)	Aeration Sizing Equipment	A submerged depth for a diffuser of les than 7.0 feet ***requires a variance.***	Why prohibited? With proper engineer application this can work.
217.157(c)(5)(B)	Membrane Bioreactor Systems	Delete this section and replace with a reference to 217.163	This design reference is different from activated sludge requirements. Requirements should be more generic.
217.158 (c)(2)	Solids Management	~~Add a section on air lift pump design~~ Revise to read **"An airlift pump must comply with the requirements of section 217.159."** Add a section on air lift pump design, 217.159.	No design criteria. ~~This is a crucial item in plants that use air lifts for process flow where measurement is critical.~~ This should refere to the proposed criteria in a separate section.
217.158 (e)(2)	Solids Management	The sludge pipe velocity does not match that on clarifier sludge pipes. These values should be consistent	Good practice to match the velocities on similar lines.

217.159 (Proposed New Section)	Air Lift Pump Design	Add the written criteria attached to these comments.	No design criteria. This is a crucial item in plants that use air lifts for process flow where measurement is critical.
217.161(c)	Fault Monitoring	Add "clarifier" to list. Add "(Unless airlift pumps are used.)" After the word "failure".	

217.159 Air Lift Pump Design

(a) The Engineer shall calculate the static submergence, static lift, dynamic submergence, dynamic lift, dynamic losses through the suction line from the water source to the air lift, and the dynamic losses through the discharge line from the air lift to the final discharge point. All calculations shall be included in the Final Design Report.

(b) The Engineer shall verify the quantity of air lifts and their ability to vary their flow rate to meet the required range of flow rates needed. . The design air rate for the corresponding minimum and maximum design flow rate of each air lift shall be noted in the final design report. The combined maximum design air flow rates for all air lifts, excluding redundant air lifts, shall be used in sizing of blowers.

(c) Each air lift shall be designed with a top expansion or vent to allow release of air and allow for continuous flow without surging.

(d) All air lifts shall be designed with a downward facing discharge to minimize splashing and prevent spraying on walking surfaces or outside of basin walls.

(e) Process Critical (Return Activated Sludge (RAS), Waste Activated Sludge (WAS) and Internal Recycle (IR)) Air lifts

1) An airlift pump must allow for cleaning without removal from a basin.

2) An RAS, WAS or IR system must have sufficient air lift pumping units to maintain the maximum design return pumping rate with the largest single air lift pump out of service.

3) Each process critical air lift must contain its own mode of flow measurement by either:

(A) External box with a flow measurement weir

(B) Rotometer located on the feed air line

i. If a rotameter is used, the Engineer must provide a graph correlating air flow rate, to the actual calculated submergence and the flow rate in the final design report and O&M manual. If a manufacturer's graph is used, the actual submergence line shall be added to clearly indicate the flow rate versus air flow relationship.

4) The minimum design static submergence is 60%.

(f) Non-Process Critical (Scum & Transfer) Air lifts

1) An airlift pump must allow for cleaning without removal from a basin.

2) The minimum design static submergence is 30%.

Rule		Proposed Change	Concern
217.2	Definitions	Add auxiliary pumps to definitions.	Rules do not address auxiliary pumps as an alternative to generators. Definition needed to aid in defining terms for other proposed rule changes related to auxiliary pumps.
217.2	Definitions	Add gravity relief sewer to definitions.	Rules do not address gravity relief sewer as an alternative to generators. Definition needed to aid in defining terms for other proposed rule changes related to gravity relief sewers.
217.2	Definitions	Add Equalization Basin definition	Delineate between an "in-series" basin which receives all flows entering a plant from an "off-line" basin which only receives peak events.
217.2 (9)	Definitions- Design flow	Change to "**Design flow**-- The ***annual*** average daily flow rate for a treatment facility permitted by the Commission	Clarity is needed because the existing definition makes design flow and permitted flow the exact same value. Why are two definitions needed if the numbers are the same.
217.21 (21)	Definitions-Grinder pump	Grinder pump - A component that receives raw wastewater **~~through a building lateral~~**, grinds the solids in the wastewater into a slurry, and provides the motive force for transporting the raw wastewater to a lift station or a collection system.	The phrasing of the definition lends it to interpretation that grinder pumps can only be used when directly connected to a building lateral/discharge and not in a station connected to a common gravity line.
217.32(a)(3)	Organic Loadings and Flows	Design organic loading. Actual organic loading data must be used as the basis for design. ***For the initial phase of a plant*** , the design organic load ***shown in Table B.1*** must be used as the basis for design. The design organic load is determined by multiplying the projected uses by annual average flow determined from the following table and by using the appropriate influent concentration from the following table	Clarity needed for when the design data table should be used. For existing facilities, sampling should be required as described later in the rules and this table should be used only when actual data is not a available, which would only be initial phases of plants.
217.32(a)(3) Table B.1	Organic Loadings and Flows	Under the "Municipality" and "Subdivision" section, revise "Wastewater Strength" to ***275-375***	Increase the minimum value to account for increased concentrations due to low flow/water conserving fixtures. Plants designed at 200 mg/L are commonly seeing organic capacity issues prior to next hydraulic expansion.

217.32(a)(3) Table B.1	Organic Loadings and Flows	Add a new column providing Ammonia concentrations for all sections. List ammonia concentrations of 40 to both municipality and subdivision and 45 to both trailer park and mobile home park	Even more than BOD, the ammonia concentrations have increased dramatically over the past few years and has caused treatment issues at many facilities. A minimum ammonia concentration should be required for plants that require nitrification to meet permit.
217.128 (c)	Flow Equalization Basins	**An in-series** flow equalization basin must include an aeration system sized to maintain a dissolved oxygen level of at least 1.0 milligram per liter (mg/l) in the flow equalization basin.	If an equalization basin is not part of a series, flow through system, then there is no need to keep the DO at a certain value as it will not affect the treatment process.
217.128 (d)	Flow Equalization Basins	**An in series** flow equalization basin must include a mixing system sufficient to prevent solids from settling.	If an equalization basin is not part of a series (flow through system) then there is no need to keep all solids in suspension. If solids settle out they can be removed after the peak event has passed.
217.157(c)(5)(B)(iv)	Membrane Bioreactor Systems	an alternative approved by ***variance***	There are many other proven nutrient removal methods that should be allowed without requiring executive director approval. Approval by variance would be acceptable.
217.157(c)(5)(B)	Membrane Bioreactor Systems	add A/O and A2/O as acceptable processes	These are widely used and accepted processes and should be included in the list of acceptable process types.
217.157(c)(5)(B)	Membrane Bioreactor Systems	Delete this section and replace with a reference to 217.163	This design reference is different from activated sludge requirements. Requirements should be more generic.
217.163 (c)	Advanced Nutrient Removal	Remove (2) and (3)	Without a minimum or maximum required Recycle ratio listed in these criteria this is not meaningful, and not necessary for design. Foaming system control design is not necessary on all plants. Require modeling for advanced nutrient removal.
217.190(b)(1)	Filtration	A facility using filtration to provide tertiary treatment for a permit requirement must have a minimum of two ***independent, fully-functioning filter basins each with independent, fully functioning equipment***	While the discs are removable without taking the basins offline, there is still a submerged bearing that requires the entire basin to be taken offline to repair, or a drive chain. Thus two separate basins are required to allow flow transfer back and forth for maintenance.

217.249 (t)(7)(c)	Sludge Stabilization	A diffuser must be designed to permit its removal without dewatering a tank for inspection, maintenance and replacement, ***or have multiple digester basins***	Multiple basins allows one to be offline for inspection, maintenance and replacement of the aeration equipment.
217.271(a)	Chlorine Disinfection	Revise to require at least two cylinders. Minimum amount should be number of cylinders required plus one spare.	One spare tank should be acceptable similar to one spare pump in a pumping station. This requirement as written requires the storage of large volumes of chlorine gas that is not needed on a regular basis and creates a safety hazard.
217.272(c)	Capacity and Sizing of Chlorine	A dechlorination system design must include at least one **mg/l** of SO2 gas to dechlorinate at least one **mg/**l of Cl2 ~~Gas~~ **residual remaining after demand is satisfied**	The SO2 dosage should be one part per part of CL2, but a portion of the CL2 injected in the chlorine contact chamber is consumed, leaving a residual which is lower than the original dosage, thus treatment part per part for the residual is acceptable.
217.280(b) Equation K.4 (2)	Design of NAClO Disinfection and NaHSO3 dechlorination systems	Add a section stating that the sodium bisulfite dosage amount shall equate to one part sulfate per part of CL2 residual.	The Sodium Bisulfite dosage should be one part sulfate per part of CL2, but a portion of the CL2 injected in the chlorine contact chamber is consumed, leaving a residual which is lower than the original dosage, thus treatment part per part for the residual is acceptable.
217.280(f)(C)	Design of NAClO Disinfection and NaHSO3 dechlorination systems	Clarify what positive drainage from below the tank means.	This requirement is ambiguous and could lead to designs that compromise the integrity of the system.
217.281(a)(3)	Application of Chlorination and Dechlorination Chemicals	Add a length to width ratio of 40:1 as an alternate to modeling of gradient for mixing.	This length to width ratio was in the ch. 317 rules and has proven functional. This should be an acceptable solution in lieu of modeling the mixing energy.
217.291	Ultraviolet Light Disinfection System Definitions	Add a design section for In-vessel UV Disinfection	In vessel UV is a technology being utilized and there is no design section.

WATER ENVIRONMENT ASSOCIATION OF TEXAS
Preserving & Enhancing the Water Environment of Texas
WEAT ▪ 1825 Fortview Road Suite 102 ▪ Austin, Texas 78704 ▪ www.weat.org

January 2, 2012

Mr. Louis C. Herrin III, P.E.
TCEQ MC-148
P. O. Box 13087
Austin, TX 78711-3087

Dear Mr. Herrin:

The Water Environment Association of Texas (WEAT) appreciates the opportunity to comment on TCEQ's proposed revisions to Chapter 217: Design Criteria for Wastewater Systems. WEAT is a non-profit technical and educational organization whose members include scientists, engineers, utility managers, operators, and regulators. Our members are responsible for the design, operation and maintenance of wastewater collection and treatment systems all across Texas.

At the stakeholder meeting on November 1, 2011, agency staff asked for input on TCEQ's proposed revisions to the Design Criteria rule. We have attached comments on two general areas of the Design Criteria rules submitted by the identified WEAT members:

1. Subchapter C: Conventional Collection Systems, and

2. Subchapter M: Safety

Thank you again for the opportunity to comment. If you have any questions or need additional information, please feel free to contact the persons noted on the enclosures or me at 512.924.2102.

Sincerely,

Carol Batterton

Carol Batterton
Executive Director

Enclosures

cc: Leigh Cerda, P.E., Burgess and Niple, Inc.
Don Vandertulip, P.E., CDM
Meg Conner, SAWS

COMMENTS SUBMITTED BY THE WEAT COLLECTIONS SYSTEMS COMMITTEE

Leigh Cerda, Chair
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1. Recommend adding a section on Trenchless Manhole Product Installation, consistent with 217.56 Trenchless Pipe Installation
    a. Alternative section title could be "Manhole Coatings and Liners"
        i. Justification: Precedent has been set with the 217.56 Trenchless Pipe Installation section. Guidance is needed in the industry with regard to Trenchless Manhole Product Installation. In many instances, Trenchless Manhole Products are installed as an option to manhole replacement, restoring structural properties and extending the life of the structure.
2. Recommend adding a section on Trenchless Lift Station Wet-Well Product Installation, consistent with 217.56 Trenchless Pipe Installation
    a. Alternative section title could be "Lift Station Coatings"
        i. Justification: Precedent has been set with the 217.56 Trenchless Pipe Installation section. Guidance is needed in the industry with regard to Trenchless Lift Station Wet-Well Product Installation. In many instances, Trenchless Lift Station Wet-Well Products are installed as an option to wet-well replacement, restoring structural properties and extending the life of the structure.
3. Recommend revising Section 217.59 Lift Station sub section D Odor Control.
    a. Clarification of the terminology "The design of a lift station must minimize potential odor. An owner shall include any design for odor control in the report." is needed to provide a specific measurable/enforceable guideline. Recommend changing the word "any" to "appropriate" or "approved" at a minimum.
        i. Justification: With numerous odor control methods/products available, owners need guidance in the goal to be achieved in odor control.
4. Recommend revising Section 217.57 Testing Requirements for Installation of Gravity Collection System Pipes. Section 2 Infiltration/Exfiltration Test.
    a. The requirement for 50 gallons per inch of diameter per mile of pipe per 24 hours should be evaluated and updated/reduced to reflect the improvements that have been made in pipe materials and installation methods.
        i. Justification: With improved pipe materials (pipe joint transitions, fused joints) and construction methods, the 50 gallon requirement should be reduced for new construction to demonstrate the industry's commitment to the reduction in infiltration/exfiltration in our wastewater collection systems.

COMMENTS SUBMITTED BY SAWS ON
CHAPTER 217 – DESIGN CRITERIA FOR SEWARAGE SYSTEMS (LIFT STATIONS)
OPERATIONS AND MAINTENANCE ENGINEERING

Meg Conner, Contact
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1. 217.60.(b).(3). Suggest addition of 8-foot high fence with one strand of barbed wire on top, as allowed on the water side, to the intruder resistant fence criteria. There are instances where a 6-foot fence with the three strands of barbed wire may not be appropriate.

2. 217.61.(a). Suggest adding a requirement for a backup high level float on pressure or ultrasonic wet well level systems.

3. 217.61.(b). Specify that 4-inch tall housekeeping pad must be large enough for maintenance personnel to stand on while performing electrical maintenance/troubleshooting. Suggest the housekeeping pad be 4-inch above lift station finish grade.

4. 217.61.(c).(5). Valves can be located in a valve vault or on a concrete pad adjacent to the wet well.

5. 217.61.(d). Ladders "and access hatches" must conform to OSHA requirements.

6. 217.61.(e).(1).(A). Screening on passive ventilation must be of Class 300 Stainless Steel, or other corrosion resistance material.

7. 217.61.(e).(1).(B). Why require explosion proof equipment only if "passive ventilation" is used? The Hazard environment is the same regardless of the type of ventilation used; suggest any equipment within the wet well be required to be explosion-proof, regardless of type of ventilation.

8. 217.61.(e).(2).(B). Again, suggest any equipment in the wet well be required to be explosion-proof, regardless of type of ventilation. Can't rely on mechanical ventilation systems.

9. 217.61.(f). The need of an anti vortex baffler should be determined by the Peak Wet Weather Flow. Suggest the need of anti vortex baffler for lift stations with Peak Wet Weather Flows greater than 3 MGD.

10. 217.61.(g). Consider rewrite; "Lift stations must either have built-in provisions for use of hoisting equipment, or provide adequate access around the wet well and elsewhere, for unimpeded removal of pumps, motors, valves, pipes, or any other equipment such as standby generators."

11. 217.61.(i).(1). Indicate that dry well sump pumps must discharge to the wet well. Suggest the pumping capacity of the sump pumps be based on Peak Wet Weather Flows, for instance, discharge 3% of Peak Wet Weather Flow minimum.

12. 217.61.(i).(2). Found this sentence unclear: "A sump pump must use separate pipes capable of discharging more than the maximum liquid level of the wet well."

13. 217.62.(a).(2). Add “unless pump design is of the semi chopper type designed for self cleaning”.

14. 217.62.(a).(3). Paragraph should read “use 3-inch diameter or greater suction and discharge openings”.

15. 217.62.(b).(1). Delete “…are required…” on the second line.

16. 217.62.(b).(5). Consider rewrite; “Pumps for lift stations with peak flows of less than 120 gallons per minute must be of the submersible, grinder type.”

17. 217.62.(c). Suggest replacing “…handle the expected peak flow” to “…handle the design peak flow.” “Expected” may be open to interpretation, “design” is not.

18. 217.62.(d).(1). Consider; “…curves which determine the pumping capacities alone, and in parallel or series with other pumps according to the design/operational configuration of the station.”

19. 217.62.(d).(4). This paragraph makes sense for lift stations with three or more pumps; for instance, where one pump would be operating under normal conditions, but two or more pumps would operate at peak conditions. Suggest revising this paragraph. This requirement will be impossible to meet for duplex systems because one pump will be operating regardless of normal flows or peak flows.

20. 217.62. Add requirement for calculation of total suction lift for self priming pumps and NPSH for both self priming and submersible pumps.

21. 217.63.(b). First sentence; consider: “The discharge side of each pump must have a check valve, followed by a full-closing isolation valve.”

22. 217.64. Before-last sentence; consider: “All collection system lift stations, not equipped with an on-site standby generator, must be equipped with commercially designed and tested quick-connection facilities for portable generators.”

23. 217.64.(3). Suggest the standby emergency generators be sized to handle all lift station electric load.

24. 217.69.(g). Last sentence; consider: “The air valves must be designed for waste water service, and must be inside of a vault at least 48 inches in diameter, with a vented access opening at least 30 inches in diameter.”

COMMENTS PREPARED BY Don Vandertulip, PE, BCEE
COLOR CODE CONFLICTS
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Code Conflict

Conflicts exist in pipe color designations that can lead to cross connection of two different quality waters. These conflicts include differences in TCEQ Chapter 217 requirements with Chapter 285 and Chapter 210. Chapter 217.321(a) Safety Design-requires compliance with WEF MOP No. 8. There are several conflicts with the most current (2009) WEF MOP No. 8 and the National Plumbing Code. Independently, Chapter 217 is in conflict with both the Uniform Pluming Code (UPC) developed by the International Association of Plumbing and Mechanical Officials (IAPMO) and the International Plumbing Code (IPC) developed by the International Code Council (ICC).

A portion of Chapter 217 is included below. Conflicts with WEF MOP No. 8 and national plumbing codes are highlighted in yellow.

§217.329. Color Coding of Pipes.

(a) A new facility must have color-coded pipes.

(b) A new facility must have tracer tape for each non-metallic underground pipe.

(c) An existing facility must color-code and install tracer tape for each pipe associated with a material alteration or expansion .

(d) A non-potable water pipe must be painted purple and be stenciled "**NON-POTABLE WATER**" or "**UNSAFE WATER**."

(e) A facility design must use the following color-coding for pipes:

(1) Sludge - brown;
(2) Natural gas - red;
(3) Potable water - light blue;
(4) Chlorine - yellow;
(5) Sulfur Dioxide - lime green with yellow bands;
(6) Sewage - grey;
(7) Compressed air - light green;
(8) Heated water - blue with 6 inch red bands spaced 30 inches apart;
(9) Power conduit - in compliance with the National Electric Code;
(10) Reclaimed water - purple;
(11) Instrument air - light green with dark green bands;
(12) Liquid alum - yellow with orange bands;
(13) Alum (solution) - yellow with green bands;
(14) Ferric chloride - brown with red bands;
(15) Ferric sulfate - brown with yellow bands;
(16) Polymers - white with green bands;

(17) Ozone - stainless steel with white bands;
(18) Raw water – tan; and
(19) Effluent after clarification – dark green.

Adopted August 6, 2008 Effective August 28, 2008

In Chapter 10, MOP No. 8, Materials of Construction and Corrosion Control, Table 10.25 includes recommended painting colors for pipeline identification within a wastewater treatment plant. A selection of those recommendations includes:

"TABLE 10.25 Recommended color code WWTPs and pumping stations.*

Service	**Stencil (1.25-m [4-ft] intervals as necessary with directional arrow)**	**Code**
Diluting water	Dilut. Wat.	Purple
Nonpotable water	Non. Pot. Wat.	Purple
Grit washer piping	G.W.P.	Purple
Sanitary vents	San. Vent.	Purple
Sealing water	Slg. Wat.	Purple
Sanitary water	San. Waste	Grey
Potable main water	Pot. Wat.	Blue
Cold domestic water	Cold Dom. Wat.	Blue
Hot domestic water	Hot Dom. Wat.	Blue
Chilled water supply	C.W.S.	Blue
Chilled water return	C.W.R.	Blue
Chilled water condensate	C.W. Cond.	Blue
Chlorine	CL2	Yellow
Steam line	Stm. Line `	Yellow
Steam condensate	Stm. Cond.	Yellow
Compressed air	Comp. Air	Green
Vacuum lines	Vac. Lines	Green
Nonpotable fire hydrants	Non-potable	Purple
Potable fire hydrants	Potable	Blue

*Unpainted items include stainless steel, aluminum, valve stems or moving parts, PVC pipe, and identification tags or plates. In corrosive areas, cupreous metals are subject to deterioration. Copper piping or tubing, including fittings and hangers, shall have applied covering against deterioration even if insulation is not required for other reasons."

Chapter 8 of MOP 8 identifies purple to designate radiation hazards, and while that is the color used in the nuclear industry to designate piping containing radioactive water, there are few wastewater plants with liquid radiation hazards, and nearly all wastewater plants utilize reclaimed water within the plant. It would be more appropriate for WEF MOP Chapter 8 to

designate purple for reclaimed water and eliminate the jade green color reference to non-potable process or flushing water. In Chapter 10, non-potable water should be referred to as reclaimed or recycled water. The five listed processes could all be supplied with reclaimed water to simplify reference codes. Chilled water system pipe designation by blue may also deserve some consideration, as these systems do not always contain potable water, so WEF could be creating a potential for cross connection with this designation. The suggestion of yellow to designate both chlorine and steam lines cold also create a safety hazard and could be in conflict with the national plumbing codes if locally enforced. Finally, wastewater utilities typically use the APWA standard of green to designate sanitary sewer pipes. WEF Chapters 8 and 10 define green to identify compressed gas, while selecting gray for wastewater or sanitary waste.

Another color conflict relates to pipe color coding for graywater. When Chapter 285 was in development, AWWA/WEF/WRA joint committees developed comments to TCEQ in response to the draft regulations. One of the 2004 comments was:

- Color-coding graywater system piping to identify it as containing non-potable water is necessary to ensure public safety, and HB-2661 designates the use of purple pipe, purple tape, or similar markings as a means to accomplish this. However, the system requirements and treatment methods are different for Type I or II reclaimed water and graywater. Color-coding both types of systems in the same manner can create confusion for those tasked with the maintenance, operation, or inspection of these different systems.

WEF, TCEQ and the American Public Works Association (APWA) Uniform Color Code (ANSI Z535.1) are in conflict with the UPC and IPC national plumbing codes. Both national plumbing codes identify green as the appropriate color code on-site and in buildings for potable water. This is directly opposite the training of utility engineers (APWA Code) that blue designated potable water and green designates wastewater. The APWA code also identifies purple for reclaimed water. The obvious conflict will occur in treatment plant work if there is a city or plumbing inspector that enforces a plumbing code requiring green pipe for potable water use on a wastewater treatment plant site that is required by TCEQ to use green for wastewater and blue for potable water. If 217.321(a) is followed, then cold, hot and chilled supply, return and condensate should also be blue according to WEF. All would be in violation of the plumbing code.

Committees for AWWA/WEF and WRA have been working since 2008 to reverse decisions by IAPMO and ICC to require purple as the pipe color code for all non-potable water onsite. The basis of this utility response is that all non-potable water is not equal in quality. Reclaimed water produced by utilities is monitored to meet state mandated standards and controlled by the utility until transferred to the user under a formal agreement. In contrast, graywater (wastewater), harvested rainwater, stormwater and condensate typically do not meet the Texas Type I or Type II reclaimed water standards. If multiple quality water is carried onsite in purple pipes, it is likely that cross connections could occur and a utility supplied reclaimed water

quality be contaminated by other onsite waters. The text labeling required in 217.329(d) is also in conflict with wording required by both national plumbing codes.

The conflict with potable water pipe color designation is more serious and neither national plumbing code organization has chosen to address the potable water pipe color conflict. This may be outside the 217 context but should be addressed.

Proposed Solutions

1. Emphasis that blue pipe is the color designation for potable water and enjoin enforcement of any local plumbing code that may adopt any other color.

2. Emphasis that green is the color for all wastewater and onsite water not meeting the state quality standards and monitoring standards of Chapter 210 Type II or Type I reclaimed water, depending on the use of the water. Enjoin enforcement of any local plumbing code that may adopt any other pipe color for non-potable water not in compliance with Chapter 210 Type I or Type II reclaimed water.

3. Change 217.329 (e) (6) color for sewage from gray to green.

4. Change 217.329 (e) (7) color for compressed air to an alternate color to eliminate confusion with wastewater piping.

5. Clarify 217.329 (e) (10) color purple applies only to municipally treated and controlled reclaimed water.

HOUSTON
CEC

March 5, 2012

Texas Commission on Environmental Quality
Mr. Louis Herrin, III, P.E.
P.O. Box 13087
Austin, Texas 78711-3087 – **MC 148**

Re: Docket No. 2011-1164-RUL
Project No. 2011-049-PET-NR

Dear Mr. Herrin:

The Houston Council of Engineering Companies (HCEC), a business association representing over 100 civil, structural, geotechnical and MEP engineering firms in the Houston metropolitan area, would like to submit to you our formal opposition for the referenced petition concerning the creation of new criteria within Chapter 217 for the rehabilitation of various wastewater facilities.

It is our understanding from the TCEQ's Interoffice Memorandum that the petition specifies:

1. Requiring that a micro-silica cementitious mortar and epoxy coating system be used exclusively for lift station, manhole and wastewater treatment plant corrosion repair and rehabilitation.
2. Epoxy protective coatings shall be applied to all concrete and metal surfaces that are exposed to hydrogen sulfide gas.

Though not included in the petition, but discussed at length during the stakeholder meeting, the petitioner and his supporters wished to extend the scope of the petition to include the addition of rehabilitation of gravity collection lines beyond what is already included in 217.

HCEC and its member firms have the following comments:

1. We are opposed to the creation of rules that restrict engineering judgment by only specifying a single method of repair as proposed in the petition. When considering how this might be complemented with other methods of repair to make an equitable and fair rule, it becomes apparent that there are many competing technologies and none are applicable to all situations. We feel that this is nearly an impossible task to write criteria that guides engineers to choose the best methods because nearly every situation is unique. A rule could be written to elevate the quality of a product or its installation but it could never instruct an engineer on how to make the right choice for each specific project. In cases where the rules have attempted to do this in the past, the "cook book" resulted in very conservative over-

design which costs taxpayers money. We can use a micro-silica cementitious mortar/epoxy system today if it is the right choice, but prefer to have a full complement of rehabilitation products and systems available to our clients.

2. As with item number one, a single product is not desirable. This proposed change does not give credit for having stainless steel, fiberglass products or concrete designed to withstand corrosive gasses. It does not differentiate between exposure to 0.1 mg/L or 30 mg/L or list some of the other suitable protective coatings that are on the market too.

3. In response to the discussion from the last stakeholder meeting on the inclusion of design criteria for sanitary sewer rehabilitation, we are opposed to any new criteria on this topic. We believe that there are other incentives and disincentives that will guide collection system owners to repair their systems. The types of products they use and the engineers they choose should be based on performance and qualifications rather than criteria. Undoubtedly there are products, systems, and engineers that are performing poorly, but we do not see enough evidence to support the addition of new criteria for everyone based on the poor performance of a few.

We thank you for allowing us the opportunity to bring forward to you proposed changes that we feel will be an improvement to the current design criteria and help in the protection of the health, safety and welfare of the citizens of Texas.

If you have any questions, or need to meet with us to go over our comments, please do not hesitate to call me at 713-426-0800, or Mr. Tobin Synatschk at 713-777-5337. In addition, we are also asking our state organization, the American Council of Engineering Companies-Texas to keep track of this process. Mr. Steve Stagner, President, or Mr. Peyton McKnight, General Counsel at 512-474-1474 may also be attending any future meetings on this matter on our behalf.

Sincerely,

Christina M. Lindsay
Executive Director

Cc: Steve Stagner, President, ACEC-TX
Peyton McKnight, General Counsel, ACEC-TX
Mr. Tobin Synatschk, P.E., HCEC Member
HCEC Board of Directors