

SECONDARY WATER QUALITY TREATMENT SYSTEM REQUEST
Bayleaf Master –Martindale #3 NC0392373
AQUA NORTH CAROLINA

A. EXECUTIVE SUMMARY

Aqua proposes installing an AdEdge iron and manganese filter to treat water at Martindale Well #3. Due to unacceptable water quality and iron and manganese levels exceeding the secondary limits this well was put offline since early 2016. Well was cleaned and put online again February 2018 and currently pumping about 25 gpm. Aqua plans to use Aquafreeze to rehabilitate the well and install filtration unit to regain approved production and meet secondary limits. This Project is included in Group 1 priority Projects in Aqua's 2018 Water Quality Plan. Being in Bay leaf master system and only well at the Martindale subdivision, water quality of this well needs to be addressed as soon as possible.

B. PROPOSED SYSTEM REQUIRING TREATMENT

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| 1. System Name: | <u>Bayleaf Master</u> |
| 2. PWS ID: | <u>NC0392373</u> |
| 3. No. Customers Being Served: | <u>39</u> |
| 4. No. Customers at Build Out: | <u> </u> |
| 5. List of DEH/PWSS Approved Wells and Storage | <u> </u> |

TABLE 1: Approved and Active Wells on Proposed System

Well Name and No.	Capacity (gpm)		12-Month Avg. Pump Runtime (hrs/day)	Most Recent Inorganic Sampling Results	
	App.	Current		Fe (mg/L)	Mn (mg/L)
Martindale Well #3	60	35	N/A	1.17	0.8

TABLE 2: Existing Storage at Well Sites

Well Name and No.	Storage Description		Most Recent Cleaning Date	
	Type	Gallons	Tank	Dist. System
Basyleaf System	Elevated tank	1,525,000		
Bayleaf System	Ground	104,500		
Bayleaf System	Hydro	10,000		

6. Past Three (3) Years Flushing Occurrences, list month/year:

Response: The system was flushed in Septemebr 2017 and in February 2018.

7. Next Planned Tank Cleaning and/or Distribution System Flushing Occurrence

Response: The syste will be flushed every year from January- April time frame.

8. List of chemicals being used :

TABLE 3: Existing Chemical Use at Well Sites

Well Name and No.	Chemical Description			
	Cl ₂	OP-37	NaOH	SeaQuest
Martindale #3	X		X	X

9. Current description of the water treatment system for each well over the past three (3) years, including specific names of chemicals and dates of changes:

Response: The system switched from OP37 to Seaquest in January 2016. A Harmsco particulate filter was installed in August of 2017.

10. Planned changes (if any) for chemical treatment within the next six (6) months:

Response: None at this time.

11. Comments on Approved/Current Well Capacity.

Response: Well Production dropped from 60 gpm to 35 gpm. Aqua freeze treatment was employed at this site during August 2017 and its going to be followed up with Aqua Guard treatment during February 2018.

CURRENT SECONDARY WATER QUALITY CONCERNS

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| 1. How many wells require treatment? | <u>1</u> |
| 2. Can system operate with single well offline? | <u>No</u> |
| 3. Are combined Fe/Mn concentrations above 1 mg/l. | <u>yes</u> |
| 4. Date of most recent Fe/Mn sampling results | <u>1/7/2016</u> |

TABLE 4.1: Most Recent Fe/Mn Inorganic Analysis at Well Head

Martindale #3 Laboratory Analysis						
Date	Iron (Fe) mg/L			Manganese (Mn) mg/L		
	In.	Sol	Tot.	In.	Sol.	Tot.
1/7/2016			1.7			0.804
3/14/2013			3.0			1.13

5. Describe previous actions to improve secondary water quality and describe results (i.e.; installation of particulate filters and sequestering agents).

Response: Added SeaQuest in January 2016.

UTILITY COMMISSION REQUIRED INFORMATION

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| 6. Well Location Map | <u>Attached</u> |
| 7. DEH/PWS Approval Letter for well #3 | <u>Attached</u> |
| 8. Original 24 hr Pump Status Report | <u>Attached</u> |
| 9. Past 36 months of pump status reports | <u>Attached</u> |
| 10. Inorganic Analysis Report submitted to DEH for well approval | <u>Attached</u> |
| 11. Past 6 yrs inorganic analysis from each wellhead | <u>Attached</u> |
| 12. Past 3 yrs Fe/Mn analyses, both soluble and insoluble. | <u>Attached</u> |

Note: For item 6 above, provide information on baseline (w/o treatment), well head (after treatment), and distribution system data.

C. CUSTOMER COMPLAINT DATA

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| 1. Total number of customer complaints in past 6 months | <u>Well is offline</u> |
| 2. Total number of customer complaints in past 12 months | <u>Well is offline</u> |
| 3. For past 6 months, do customer secondary water complaints exceed 10% of the number of active customers? | <u>No</u> |
| 4. Provide 12-month list of all water quality complaints | <u>N/A</u> |
| 5. Provide 12-month list of all completed water quality work orders | <u>N/A</u> |
6. Describe most common customer complaint over the past 12-month period relating to secondary water quality, i.e.; discolored water, taste, or odor.

Response: Well was put offline due to very bad waterquality from February 2016 - February 2018.

D. PROPOSED SECONDARY WATER QUALITY TREATMENT

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| 1. Proposed treatment recommendation: | <u>AdEdge Filtration</u> |
| 2. Proposed System Costs | <u>\$300,000-350,000</u> |
| 3. Estimated annual operating expenses of backwash disposal | <u>\$2000</u> |
| 4. Comments: Aqua proposes an AdEdge iron and manganese filter to be installed at Martindale #3. | |