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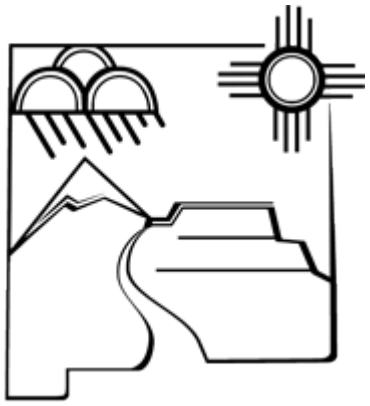

INSPECTION REPORT

For

Morningstar Water Supply System
NM3510524

Este informe contiene información importante acerca de su agua potable.
Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.

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9 June 2016

State of New Mexico
Environment Department
Water Protection Division
Drinking Water Bureau

RECORD OF INSPECTION

This report fulfills the requirements of NMAC 20.7.10.100 incorporating 40 C.F.R. 141.723 for conducting a State approved inspection. The report was prepared by Joseph C. Savage, Surface Water Treatment Rule Administrator

NMED APPROVING AUTHORITY: _____ Date: 9 June 2016

Joseph C. Savage, Surface Water Treatment Rule Administrator

Introduction

In response to numerous complaints from Morningstar consumers, the New Mexico Environment Department Drinking Water Bureau (DWB) conducted a site inspection of the Morningstar Water Supply System. The inspection was conducted by Environmental Scientist Specialist Tanya Trujillo, Surface Water Treatment Rule Administrator Joseph C. Savage, Northern Region Supervisor Chris Cudia, PWSS Program Manager Joe Martinez, and Morningstar Water Supply System operators Thomas Barrow and Jose Grejilra.

System Description

The Morningstar Water Supply System has approximately 6,423 residents and is classified as a Community water system according to the New Mexico Drinking Water Regulations 20.7.10 NMAC. The water system consists of 1,835 metered connections. The system's source of water is the Animas River. Raw water from the Animas River intake is pumped to three pre-sedimentation reservoirs where alum is injected. Water from the reservoirs is gravity fed into a settling pond. From the settling pond a 5-HP surface float pumps water into three pre-treatment chambers; each chamber consists of a flocculation chamber, a settling tube chamber, and a sand filter chamber. Polymer is injected prior to the flocculation chambers. Water from the sand filters then enters the treatment plant and is treated through pressure filters. Disinfection occurs after filtration through the use of aqueous sodium hypochlorite. Treated water from the plant is detained in three 18,000 gallon contact tanks before being pumped into distribution.

Survey Findings

Compliance inspections serve as a proactive public health measure and can provide important information on a water system's design and operations, can identify minor and significant deficiency(s) for correction before they become major problems, and can improve overall system compliance.

Significant Deficiencies:

A significant deficiency is defined as any deficiency that is causing, or has the potential to cause a threat to public health. NMAC 20.7.10.100 Incorporating 40 C.F.R. § 141.723(c)(d). Water systems must consult with the DWB within 45 days after receipt of the report, indicating how and on what schedule the system will address significant deficiencies noted in the inspection report.

A total of 29 significant deficiencies were identified at the Morningstar Water Supply System during the inspection conducted on Thursday 2 June 2016:

1. SW01 Deficiency: Inadequate Intake

Regulatory Citation	40 CFR 141.723(b)
Concern/Description:	Direct Contamination; Delivery. The intake and diversion do not allow water to be regulated in times of high river turbidity or storm events.
Corrective Action:	An intake with grates to limit large suspended contaminants and with a system to easily and readily control flow is needed to protect the reservoirs from highly turbid and contaminated water.

2. SW03 Deficiency: Chemical Tanks Inadequately Labeled

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Direct Contamination; Delivery. Inadequate labeling of chemical tanks could result in improper chemical injections or treatment of the drinking water. No tanks or chemicals in use were labeled.

Corrective Action: Please submit documentation verifying that all chemicals are clearly and accurately labeled.

3. SW05 Deficiency: Lack of, or improper containment for liquid chemicals

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Direct Contamination; Delivery. Improper chemical storage containment could result in large quantity spills and/or mixing of incompatible chemicals during a spill event. No secondary containment was in use.

Corrective Action: Please submit documentation verifying that secondary containment is provided for all chemicals in use or stored in the treatment plant.

4. SW06 Deficiency: Lack of standby chemical feeders for each chemical

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Direct Contamination; Delivery. Lack of standby feeders/pumps could result in improper treatment if the main chemical feeders malfunction. Spare chemical/disinfectant feed pumps were not identified during the inspection.

Corrective Action: Have spare chemical feed pumps readily available in the treatment p Please submit documentation verifying that spare chemical feed pumps are readily available in the treatment plant.

5. 001V Deficiency: Inadequate or lack of an operations and maintenance plan or necessary operational policies.

Regulatory Citation: NMAC 20.7.10.400.E

Concern/Description: Delivery; Operation/Management. An Operation and Maintenance (O&M) Plan is an essential part of any water supply system. The manual should summarize the actions necessary to identify those steps required for cost effective, efficient, safe, and reliable project start-up and continued successful operation. A proper plan should result in a flawless transition from one operator to the next. Lack of a proper O&M plan could result in insufficient operation of the water system as well as prolonged water outages during emergency situations. Lack of an adequate O&M plan can result in poor treatment decisions, water outages; failure to monitor; equipment failures; inability to obtain needed services or parts, and improper operation of facilities.

Corrective Action: Please submit documentation verifying that an accurate and updated Operations and Maintenance (O&M) plan, standard operating procedures, and a set of operational policies are in place at the Morningstar Water system. Implement the plan by training all operators and ensuring that proper procedures are consistently followed.

6. SW07 & SW24 Deficiencies: Lack of excessive sludge accumulations prevented; the settling process not working properly

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Direct Contamination; Delivery. Improper sludge control could result in short circuiting of the treatment process. The tube settlers and sand filters are not maintained properly. Inoperable flocculation paddles and broken tube settlers were observed during the inspection. Backwash procedures are ineffective.

Corrective Action: Please submit documentation verifying that excessive sludge accumulations prevented and the settling process, including mixing of flocculant, is working properly. Also submit documentation verifying that all tube settlers have been repaired or replaced as well as verifying that criteria for backwashing based on well-defined parameters. The backwash procedures need to be part of the O&M plan.

7. SW08 Deficiency: Unacceptable Filter Media

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Direct Contamination; Delivery. Unacceptable filter media could result in improper filtration of treated water. The pressure filters appear to be ineffective in lowering turbidity. Turbidity leaving the pressure filters had a turbidity only slightly lower than water leaving the sand filters, and finished water is consistently out of compliance with surface water rule requirements. The operator was unable to verify or demonstrate that the proper media, free of mud balls, excessive sludge, or debris was present in any of the pressure filters.

Corrective Action: Please submit documentation verifying that the current pressure filter media has either been inspected for adequacy and verified to be of acceptable quality or replaced with new media.

8. SW09 Deficiency: Lack of, or improper filter backwashing criteria

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Direct Contamination; Delivery. Lack of, or improper filter backwashing criteria could result in improper filtration of treated water, breakthrough of pathogens, or possibly shorter filter runs. There is no logical or proper criteria for when the pressure filters are backwashed. Furthermore, backwash did not appear to improve filtration.

Corrective Action: Please submit documentation verifying that proper and consistent criteria for backwashing all pressure filters is has been initiated and is based on well-defined parameters. The backwash procedures need to be part of the O&M plan.

9. SW10 Deficiency: Lack of or improper pipe labeling within the treatment plant

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Direct Contamination; Delivery. Improper pipe labeling could result in potential cross connections within treatment plant. None of the piping in the plant was labeled for type of water or direction of flow.

Corrective Action: Please submit documentation verifying that all pipes and lines within the treatment plant have been properly labeled to clearly display type of water and direction of flow.

10. SW12 Deficiency: Lack of, or improper calibration and record keeping of calibrations for meters or lab equipment

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Direct Contamination; Delivery. Improper calibration of meters or lab equipment could result in improper dosing of chemicals, inadequate treatment, or improper compliance reporting to NMED-DWB. No calibration records were identified during the inspection. It was unclear when or under what circumstances the turbidimeter and chlorine meter were calibrated.

Corrective Action: Please submit documentation verifying that the turbidimeter and chlorine analyzer have been properly calibrated according to a set procedure and at specific intervals or operating conditions set forth in the O&M manual or a formal procedural document. Also submit documentation verifying that proper calibrations will be conducted and documented at required intervals in the future.

11. SW13 & SW33 Deficiency: Improper treatment of drinking water, including not meeting proper inactivation of pathogens; lack of CT calculations during periods of fluctuating chlorine residuals, increased flows, or following changes in plant design or piping

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Direct Contamination; Delivery. Improper treatment of drinking water or not meeting proper inactivation of pathogens could result in improperly treated water.

CT remains unchanged for a given facility only if there are no changes in flow, piping, water temperature, pH, and chlorine residual. If any of these parameters change, the CT will also change and water systems must ensure that the CT values are within the compliant range.

CT values unknown, never calculated by operators. Based on the observations at the time of the inspection, it is suspected that Morningstar is not meeting the required CT prior to the first customer as required by regulations. Furthermore, there is an incredibly high chlorine demand, cutting residuals down to a trace after a very short period of time and water volume.

Corrective Action: Please submit documentation verifying that CT is continually being calculated by operators and being met by the treatment process. CT must be calculated daily at the time of lowest free chlorine residual and peak flow. A compliant inactivation ratio must be maintained at all times water is being produced. If it is determined that the inactivation ratio is out of compliance, modifications must be made immediately to ensure proper inactivation of pathogens. The modifications can include reducing the produced water flow and increasing the concentration of disinfectant, however, if these modifications are not sufficient to ensure inactivation of pathogens, then physical modifications to the water system must be undertaken.

12. 005P Deficiency: Inadequate treatment plant failure alarm or auto shut down

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Delivery; Operation/Management. Inadequate treatment plant alarm or auto shut down could result in inadequate treatment of the drinking water and possible adverse health effects for consumers of that drinking water. The entire plant is operated manually and this poses a risk of improper treatment due to the complexity of the plumbing and valving.

Corrective Action: Please submit documentation verifying that a shutdown procedure has been implemented for times when turbidity or disinfectants are out of compliant range.

13. 004G Deficiency: Disinfectant residuals not measured and recorded at entry point or in distribution

Regulatory Citation: 40 CFR 141.72 & 40 CFR 141.74(c)(2)

Concern/Description: Operation/Management. Verification of disinfectant residuals is essential in determining if potential contamination is occurring within the distribution system. An increased disinfectant demand is an indicator of microbial growth within the system. Although the continuous chlorine meter appeared to be functional, it is not clear that it is measuring at the entry point to distribution. Furthermore, values observed on the meter are strikingly lower than those taken from the sink in the treatment plant.

Corrective Action: Please submit documentation verifying that the online chlorine analyzer has been properly calibrated and maintained. Also submit verification that it is measuring water known to be at the entry point to distribution. Measurements taken from this analyzer must be monitored continuously and the lowest daily concentration must be reported on the monthly operating report.

14. SW14 Deficiency: Inadequate filtration of subpart H source

Regulatory Citation: 141.73 & 141.500

Concern/Description: Direct Contamination; Treatment; Confirmation/Monitoring; Delivery; Operation/Management. Inadequate filtration could lead to microbes entering the distribution system. Compliant turbidities are not being met by the treatment process: turbidity data indicate that finished water is consistently above 0.3 NTU and often above 1 NTU.

Corrective Action: Please submit documentation verifying that the water is being treated to maintain a finished combined filter effluent turbidity below 0.3 NTU for more than 95% of measurements each month and which at no time exceed 1 NTU. Describe in detail, how this will be accomplished, how soon this will occur, and what measures will be taken in before this is accomplished.

15. SW15 Deficiency: Inadequate process control monitoring or record keeping

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Operation/Management. Inadequate monitoring or recordkeeping could lead to contamination. If the flocculation, sedimentation, and coagulation processes are not adequately recorded and tracked, the operators are less likely to adjust to changing water quality which could result in improperly treated water. There appears to be no compliant monitoring, recordkeeping, or reporting.

Corrective Action: Please submit documentation verifying that process control monitoring and recording for chemical addition, individual filter turbidity, disinfectant addition, and CT are provided. This must all be part of the O&M plan and implementation.

16. SW18 Deficiency: No flow pacing of key chemical

Regulatory Citation: 40 CFR 141.723(b)

Concern/Description: Operation/Management. Fluctuating or irregular chemical flow could result in inadequate removal of contaminants and sediment. The manual plant operation without constant determination of water flows does not allow for proper chemical pacing.

Corrective Action: Please submit documentation verifying that an automated process has been implemented to allow for pacing of chemical additives. If this is not feasible then flows need to be measured, recorded, and the amount of chemicals fed into the system need to be calculated and manually adjusted based on the calculations.

17. SW20 & SW27 Deficiency: Inadequate sample locations; inadequate turbidity measurements

Regulatory Citation: 40 CFR 141.560

Concern/Description: Operation/Management. Without properly placed turbidity sampling locations on each filter, the operators cannot adequately determine treatment procedures to minimize contamination.

Corrective Action: Please submit documentation verifying that continuous read turbidimeters are installed at all required regulatory locations.

18. SW21 Deficiency: Leak at chlorine injection point

Regulatory Citation: NMAC 20.7.10.400B

Concern/Description: Direct Contamination; Delivery. Leaks can result in direct contamination of the water delivered to distribution. A leaky chlorine injection point could result in fluctuating and potentially inadequate addition of disinfectant to the water supply. Leaks were observed at chlorine injection and on the pump.

Corrective Action: Please submit documentation verifying that all leaking connections on the disinfectant injection pump and at the injector have been repaired.

19. SW22 Deficiency: Leak at fixtures and ports on pressure filters

Regulatory Citation: NMAC 20.7.10.400B

Concern/Description: Direct Contamination; Delivery. Leaks can result in direct contamination of the water delivered to distribution. Water was observed leaking from many of the pressure filter ports and plumbing connections.

Corrective Action: Please submit documentation verifying that all leaking ports and connections on the pressure filters have been repaired.

20. 001E Deficiency: General housekeeping

Regulatory Citation: NMAC 20.7.10.400B

Concern/Description: Direct Contamination; Delivery. Poor or inadequate housekeeping and general facility disrepair can lead to contamination of water as it is treated. The treatment plant was observed to be dirty with wet floors, walls and ceiling had holes and appeared to be water logged in places. This could lead to mold growth in addition to a place to propagate pathogens.

Corrective Action: Please submit documentation verifying that a routine cleaning and maintenance plan has been implemented and that all facilities that are in disrepair have been properly repaired and/or maintained.

21. SW22 Deficiency: Cross connections present

Regulatory Citation: NMAC 20.7.10.400B

Concern/Description: Direct Contamination; Delivery. Cross connections could result in direct contamination of the water delivered to distribution. Numerous cross connections with inactive pipes, pumps, and filters were observed during the inspection. Althought they are mostly valved off, these valves can fail, and there is no indication that they have not already failed.

Corrective Action: Please submit documentation verifying that there has been a physical disconnection of all inactive and unused lines, pumps, and filters that are not in use.

22. SW29 Deficiency: Chlorine residual must be kept at least 0.2 mg/l at the entry point to distribution

Regulatory Citation: 141.74(c)(2)

Concern/Description: Operation/Management. The regulations specify a minimum chlorine residual being greater or equal to that required to maintain minimum CT, or at least 0.2 ppm entering distribution. A lower residual chlorine concentration could result in inadequately disinfected water entering distribution thus potentially increasing the risk of microbial contamination. Free chlorine residuals measured in the plant (as observed on the in-line continuous analyzer and verified by a handheld chlorine analyzer) and at the first connection in distribution during the inspection (as measured with the handheld analyzer) indicate values consistently below 0.2 ppm. The 3 contact tanks are intended to increase contact time and measurement after the tanks indicate a very high chlorine demand.

Corrective Action: Please submit documentation verifying that chlorine residuals entering distribution are being maintained at a minimum of 0.2 ppm or higher at all times water is being produced. The cause of inadequate residual must be determined and corrected.

23. SW30 Deficiency: Required monitoring equipment not present (e.g., bench top turbidimeter)

Regulatory Citation: 141.74(a)(1); 141.560(b); 141.74(a)(2)

Concern/Description: Operation/Management. If a water system has continuous turbidity measurement, each turbidimeter must be calibrated and the accuracy validated on a routine basis with a bench top unit or other accepted instrument. If grab samples are needed during times of in-line turbidimeter malfunction , then a bench top turbidimeter is required. If a benchtop chlorine residual meter is not present, then the water system has no way to track residuals in the event the on-line meter malfunctions. No bench turbidimeter or chlorine monitors are available to the operators.

Corrective Action: Please submit documentation verifying that a benchtop turbidimeter and chlorine analyze have been purchased and are in use as well as train all operators in their proper calibration and use. This must also be included in the O&M plan.

24. SW32 Deficiency: Lack of temperature and pH data

Regulatory Citation: 141.74(a)(1)

Concern/Description: Operation/Management. CT remains unchanged for a given facility only if there are no changes in flow, piping, chlorine residual, temperature, or pH. If any of these parameters change, the CT will also change and water systems must ensure that the CT values are within the compliant range.

Corrective Action: Please submit documentation verifying that temperature and pH are being monitored and recorded daily. This procedure must be included in the O&M plan.

25. 005O Deficiency: Operations staff lacks understanding of treatment method & objectives, process control, and key chemical interactions

Regulatory Citation: 40 CFR 141.723(b) & 40 CFR 141.70(c)

Concern/Description: Direct Contamination; Delivery. The DWB has determined that this is currently causing, or has the potential for causing, the introduction of contamination into the water delivered to consumers. Operators appear to be somewhat familiar with the plant plumbing, but not the regulations or the requirements for treating and ensuring compliant finished water. Plant lacks jar testing apparatus and other basic process control equipment.

Corrective Action: Please submit documentation verifying that additional training has been provided to all water operators to address treatment methods, process controls and all aspects of treating surface water.

26. 003Q Deficiency: Required records not kept on site.

Regulatory Citation: 40 CFR 141.33

Concern/Description: Confirmation/Monitoring. Failure to maintain records on site will affect the operator's ability to make process control decisions for treatment, operational decisions for system maintenance and system monitoring requirements. Calibration records, if exist, were not present during inspection.

Corrective Action: Please submit documentation verifying that all required records are being properly maintained and are available for operators on site.

27. 002J Deficiency: Materials in contact with potable water are not approved for use in PWS

Regulatory Citation: NMAC 20.7.10.400.K

Concern/Description: Direct Contamination; Delivery. Materials which are not approved for use in drinking water may fail prematurely or introduce contaminates into the drinking water supply. Rigid and flexible hoses are used throughout, and these appear not to be NSF approved.

Corrective Action: Please submit documentation verifying that that the hoses and pipes are NSF approved. Replace all non-NSF approved hoses (or those without documentation supporting approval) with approved lines.

28. 001Q Deficiency: Storage facilities are not accessible

Regulatory Citation: NMAC 20.7.10.400.B

Concern/Description: Direct Contamination. Properly protected storage facilities prevent contaminated water, insects, vermin, or other potential contaminants from entering the facility. Accessibility is required to inspect, clean, and maintain the storage tanks. Contact tanks are inaccessible to inspection, cleaning, and maintenance.

Corrective Action: Please submit documentation verifying that access to contact tanks for inspection, cleaning, and maintenance is available. It appears likely that the contact tanks are contributing to the extremely high chlorine demand. These tanks may require inspection and cleaning.

29. TBD Deficiency: Backwash recycle rule

Regulatory Citation: 40 CFR 141.76

Concern/Description: Direct Contamination. Properly recycled backwash water is essential in protecting public health. Notification of backwash water recycling is required and the location of the reintroduction of backwash water must be specified and approved by the State.

Corrective Action: Please provide formal notification of the reuse of backwash water to include the proper placement and treatment of this water.

CONCLUSION

The inspection of the Morningstar Water Supply System treatment plant was completed on 2 June 2016. Based upon the onsite inspection, 29 significant deficiencies were identified. **Morningstar Water Supply System must consult with the DWB within 45 days of receipt of this report, indicating how and on what schedule the system will address all significant deficiencies noted in this inspection report.**

If you have any questions or need additional clarification concerning this report please call 575-437-7115 or send e-mail to joe.savage@state.nm.us.