

# JOINT DEP – CEHA SITE INSPECTION

DEP site inspection findings and corrective actions  
[Special Projects Unit]

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## OVERVIEW:

- ❖ Acronyms
- ❖ Process of site inspection
- ❖ Findings
  - ❖ Well | Source issues
  - ❖ Treatment plant issues
  - ❖ Water Quality Issues
  - ❖ Water systems and Licensed operators
- ❖ Questions & Comments

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## Acronyms

- Community water system – (CWS)
- NJDEP Bureau of Safe Drinking Water – (BSDW)
- NJDEP Bureau of Water System Engineering – (BWSE)
- NJDEP Bureau of Water Compliance and enforcement – (C&E)
- Department of environmental protection – (DEP)
- Distribution system – (DS)
- Maximum contaminant levels – (MCL)
- Noncommunity water system – (NCWS)
- Raw Water – (RW)
- Raw Water sample tap – (RWST)
- Point-of-entry – (POE)
- Point-of-use – (POU)
- Water system – (WS)

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## PROCESS OF SITE INSPECTION

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## Process of Site Inspection

### Before Site Inspection

1. Select water system(s) (WS) for site inspection from a list of facilities with sensitive population that has not been inspected for the past two (2) years.
2. Coordinate with County Health Department and Licensed Operator for a specific date.
3. Review Subject Item Inventory in NJEMS for treatment processes and background of licensed operator
4. Familiarize ourselves with raw/treated water quality and violations via Drinking Water Watch

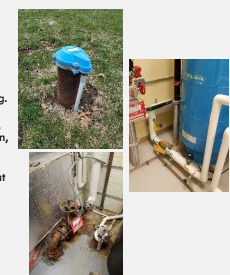


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## Process of Site Inspection

### Site Inspection

1. Walk through with CEHA inspector, licensed operator, and facility manager from the raw water to POE.
2. Take pictures of the facility for documentation while inspecting.
3. Review site visit logbook and O&M Manual located on-site to check for any deficiencies or outdated information. In addition, to make sure operators are keeping a record of their visits.
4. After the completion of inspection, indicate any issues found at the treatment facility to the licensed operator and facility manager.
5. Provide explanation for each issue.
6. Inform the licensed operator and facility manager that a follow-up letter will be sent by the Department.



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## Process of Site Inspection

**After Site Inspection**

1. Write a site inspection report with our findings and photos in NJEMS
2. Determine required Corrective Actions based on findings.
3. Send a follow-up letter to WS and LO and a copy to CEHA.
4. Wait for a response from the WS, certified laboratory for the results and/or the facility. [Timeframe of 30 or 45 days]
5. If applicable, analyze and suggest/recommend the WS to install or remove treatment processes. If results are within MCL, send approval letter.

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## FINDINGS: WELL | SOURCE ISSUES

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## Finding:

(1) Source water issues



- » Water system do not own their own well
- » Well is located near a cemetery
- » Close to Septic Tank or Sewer Piping

**Under N.J.A.C. 7:9D-2.7 Minimum Distance Requirements:**

(a) All new Category 1 and Category 2 wells shall be located at least five feet horizontally from a building or any portion thereof, except for a pump house.

(b) All Category 1 wells and components shall be located no less than the minimum distances prescribed as follows (all distances are in feet):

Component	Building sewer	Septic tank	Septic basin	Disposal field	Septage pit	Dry well	Cess tank	Fuel Storage
Well	25	50	50	100	150	50	150	25
Section line	25	50	50	100	100	50	150	-
Water service	5	10	10	10	10	-	25	-

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## FINDINGS: TREATMENT PLANT ISSUES

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## Finding:

(1) ALL TREATMENT Facility ... needs to provide water that meets the Federal and State Primary and Secondary Drinking Water Standards.

As stated in the Safe Drinking Water Act N.J.A.C. 7:10-12.33(a)2

2. Treatment facilities shall be capable of producing water that meets the applicable State primary and/or secondary drinking water regulations at N.J.A.C. 7:10-5 and 7.

Please reference to ...

N.J.A.C. 7:10-5 (Subchapter 5) – State Primary Drinking Water Regulations  
 N.J.A.C. 7:10-7 (Subchapter 7) – State Secondary Drinking Water Regulations


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## Finding:

(2) ALL TREATMENT INSTALLED...needs to be NSF Certified.

As stated in the Safe Drinking Water Act N.J.A.C. 7:10-12.33(a)5 states...

5. Point of entry treatment (POET) devices may be used to treat water in any public noncommunity or nonpublic water system. The Department recommends that such devices be certified to meet appropriate ANSI/NSF standards 42, 44, 53, 55, 58, and 62 as amended and supplemented, or the equivalent. POET devices shall also meet ANSI/NSF Standard 61 if used in public noncommunity water systems. In addition, POET devices shall meet the following requirements:



**NSF Standards for Water Treatment Systems**

**NSF/ANSI 42** – Filters are certified to reduce aesthetic impurities such as chlorine and taste/odor. These can be POU or POE treatment system

**NSF/ANSI 44** – Water softeners use a cation exchange resin that is regenerated with sodium or potassium chloride.

**NSF/ANSI 53** – Filters are certified to reduce a contaminant with a health effect/

**NSF/ANSI 55** – Ultraviolet treatment systems use ultraviolet light to inactivate or kill bacteria, viruses and cysts in contaminated water (Class A) or to reduce the amount of non-disease causing bacteria in disinfected drinking water (Class B).

**NSF/ANSI 58** – Reverse osmosis systems incorporate process that uses reverse pressure to force water through a semi-permeable membrane. Most reverse osmosis systems incorporate one or more additional filters on either side of the membrane.

**NSF/ANSI 62** – Distillation systems heat water to the boiling point, and then collect the water vapor as it condenses, leaving behind contaminants such as heavy metals.

Reference: <http://www.nsf.org/Consumers/resources/water-quality/water-filters-testing-treatment/standards-water-treatment-systems>

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### Finding:

**(3) Raw water configuration**

- » RWST is not present or incorrectly installed
- » Check valve not present or incorrectly installed
- » Drain port of hydropneumatic tank is incorrectly labeled as RWST

**CORRECT Raw Water Configuration**

Correct installation is important for several reasons...

1. RWST before check valve provides representative sample if raw water sample is necessary.
2. Check valve will prevent any contaminants back into the source if back-siphonage was to occur.

Correct Installation (Shown Above)

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### Finding:

**(4) Treatment Plant Configuration**

- » All treatment processes should be installed to treat water for POE and **NOT** for POU.
- » Either unnecessary treatments are installed or installed in an incorrect order.
- » Any chemicals used at a facility should be placed in a containment tray for safety of the licensed operator and other personnel entering the facility.
- » Chemical injection pumps should be placed on a shelf or above the level of the chemical inside the containment.
- » Disinfection should be the last form of treatment processes at any treatment facility.

POU filter installed

Chemical Injection Pump Last Form

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### Finding:

**(4) Treatment plant configuration (cont.)**

- » Ion exchanger backwash wastewater discharged to storm drain or to any unapproved location is not allowed.
- » Failure to maintain the treatment. (ex: treatment failure, not clean...) - BSDW is now issuing FTMT violations.
- » Most have a true POE tap and tap after each treatment process.[N.J.A.C. 7:10-12.33(a)5]
- » RWST should have outlet that will drain completely. Should not be a vertical pipe with a gooseneck down

Well & TP Air Outlet

Pressure Tank Outlet of RWST

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### Finding:

**(5) Jet pump installation**

...delivers water and water pressure to a household. It usually includes a pressure switch installed on the impeller body to turn pump on and off automatically.

- » Due to the treatment plant configuration of...

Jet pump installation must be adjusted to allow the pump to work properly.

Jet Pump # 1

Jet Pump # 2

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### Finding:

**Example 1**

PS = PRESSURE SWITCH  
PI = PRESSURE INDICATOR  
SP = RAW WATER SAMPLE POINT  
CV = CHECK VALVE

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### Finding:

**Example 2**

\*\*All supply line should be installed after CV\*\*

PS = PRESSURE SWITCH  
PI = PRESSURE INDICATOR  
SP = RAW WATER SAMPLE POINT  
CV = CHECK VALVE

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# FINDINGS: WATER QUALITY ISSUES

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**IMPORTANT:**

Please remember that a permit from the County is required for any addition of treatment and/or treatment modification. If you have any questions, contact your County Health Department for additional information.

Find your Local Health Departments in New Jersey:  
<https://www.state.nj.us/health/lh/community/>

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**Finding:**

**(1) Raw water with low pH**

During our site inspections throughout the State, there were many water systems with raw water pH below 6.5. Some systems had pH as low as 4.

**Why is low pH in Drinking Water an issue?**

- Water with low pH can be acidic, naturally soft, and corrosive. Acidic water can leach metals from pipes such as lead, copper, and zinc. As a result, this can cause health problems as well as possible MCL exceedances for compliances for DEP. [N.J.A.C. 7:10-7.2 (a)]

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**Correct Treatment:**

**(1) Raw water with low pH**

- Optimum range for pH under Federal and NJ State Secondary Drinking Water Standard is between 6.5 and 8.5.
- If Raw Water pH is between **6.5 and 5.9** ... single media calcite filter should be installed. (Calcium Carbonate or CaCO<sub>3</sub>)
- If Raw Water is pH < **5.9** ... dual media calcite filter should be installed. (Calcium Carbonate CaCO<sub>3</sub> : Magnesium Oxide MgO) 80 – 90 % 10 – 20 %

**OR** Install Soda Ash (Na<sub>2</sub>CO<sub>3</sub>) Feed System by chemical feed pump

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**Finding:**

**(1) RAW WATER WITH LOW pH**

Calcite Filters installed for Acid Neutralization

Soda Ash Injection Pump

Soda Ash Containers

No Chlorine Containment

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**Finding:**

**(2) Raw water with hardness issue**

- Our finding was that many water systems had **ZERO** hardness after their cation exchange unit to remove high hardness of 300 – 500 mg/L. However, this water is considered non-potable.

No hardness is considered an issue because... when there is no hardness, soft water starts to pull calcium, magnesium, and other minerals from the bones. This can cause tiredness, fatigue, and other health problems. It is especially problematic when children, elderly, and other sensitive population drinks this water.

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### Correct Treatment:

(2) Raw water with hardness issue

- » Recommended Upper Limit under Federal and NJ State Secondary Drinking Water Standard is 250 mg/L (ppm). Our recommended range for hardness is 100 – 150 mg/L (ppm)
- » If **NO** other raw water quality issues other than hardness, water system can blend raw water and cation exchanger effluent (no hardness) water to the recommended range.

**Important Fact:**  
In hardness, 1 grain is 17 mg/L

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### Finding & Correct Treatment:

(3) Raw water with ARSENIC/RADIUM ISSUES

- » Water systems are advised by Licensed Operator or consultant to install cation exchange to remove arsenic and radium in RW. However, this results in **NO** hardness in water because calcium and magnesium are also removed.

If cation exchanger is installed to remove element for which an MCL is established, calcite filter must be installed after the cation exchange unit (No bypass is allowed).

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**As**  
Arsenic  
(74.9216)

Radium  
88  
**Ra**  
(226)

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### Finding & Correct Treatment:

(4) Raw water with NITRATE/URANIUM issues

- » Water systems are advised by Licensed Operator or consultant to install anion exchange to remove nitrate and uranium. However, this time, hardness is there BUT pH will be low.

If anion exchanger is installed, a calcite filter must be installed after the anion exchange to increase the pH to the optimum range.

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### Finding & Correct Treatment:

(5) Raw water with HARDNESS/ARSENIC/RADIUM **AND** NITRATE/URANIUM issues

- » If BOTH cation and anion exchange units are installed for removal of contaminants, the treatment processes should be installed in an order of ...

**Cation Exchange → Anion Exchange → Calcite Filter**

The reason for calcite filter at the end is to add hardness and pH to the treated water to be within the drinking water standards.

From our site inspection, many systems had the processes installed incorrectly.

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### Finding & Correct Treatment:

(6) Raw water with RADIUM **AND** RADON GAS

- » In this case, raw water has both radium and radon gas. The correct treatment order would be the following ...

**Cation Exchange → Calcite Filter → Air Bubbler → Pump → Pressure Tank**

Reason for each process:

- » Cation exchange – Removes hardness (Ca<sup>2+</sup>, Mg<sup>2+</sup>), radium, and other cations
- » Calcite filter – Adds hardness and increases pH
- » Air Bubbler – Removes Radon gas
- » Pump – Due to open piping, needs to be re-pressured into the pipes for DS
- » Pressure Tank – Maintain pressure within DS

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## FINDINGS: WATER SYSTEM & LICENSED OPERATOR

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## WATER SYSTEMS & LICENSED OPERATORS:

**(1) Responsibility**

- » Water System and Licensed Operator are held responsible for providing and maintaining water quality of the water system that complies with the Federal and NJ State Primary and Secondary Drinking Water Standards **AND** for any issues with the treatment processes.
- » All deficiencies identified during site inspection **must** be addressed within provided timeframe. **(30 days or 45 days)**. This may include...
  - » Conduct water quality analysis (raw water, effluent of treatment units, and POE)
  - » Installment, Rearrangement, or Removal of treatment processes
  - » Update the Operation & Maintenance Manual
- » Failure to do so will result in Water System and Licensed Operator being referred to NJDEP C&E for enforcement and possible penalties.

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## WATER SYSTEMS & LICENSED OPERATORS:

**(2) Post-inspection & Follow-up letter**


- » The site inspection report and follow-up letter will be created within two (2) weeks from the site inspection.
- » Follow-up Letter will be sent to the following...
  - Owner of the Water System
  - Licensed Operator
  - NJDEP BWSE County Manager
  - County Health Department

**IMPORTANT:**

- » **Requires** a response from the water system or licensed operator within **30 or 45 days**.

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## UPDATES & UPCOMING



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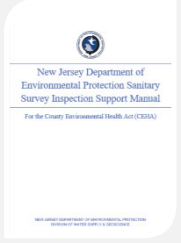
## UPDATES & UPCOMING

**(1) CEHA Manual**

- » This manual will be utilized to assist CEHA in their inspections identifying condition and/or significant deficiencies that may be problematic.


**(2) CONSUMER FACTSHEET**

- Considerations When Purchasing Water Treatment Equipment For Small CWS and NCWS
- More...



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## QUESTIONS or COMMENTS?



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## FOR ANY QUESTIONS OR CONCERNS...

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