COMMONWEALTH of VIRGINIA

*Department of Health*

B. Cameron Webb, MD, JD
State Health Commissioner

P O BOX 2448
RICHMOND, VA 23218

TTY 7-1-1 OR
1-800-828-1120

OFFICIAL ELECTRONIC COMMUNICATION- NO HARD COPY TO FOLLOW

SUBJECT: LOUISA COUNTY
Waterworks: Louisa County Zion Crossroad
PWSID: 2109990

February 23, 2026

Ms. Pam Baughman, General Manager
23 Loudin Lane
Louisa, Virginia 23093

Dear Ms. Baughman:

Enclosed please find Waterworks Operation Permit No. 2109990 with Operation Permit Conditions dated February 23, 2026, issued by the Commonwealth of Virginia Department of Health, Office of Drinking Water. This permit is your authorization from the State Health Commissioner to operate the subject waterworks located in Louisa County in accordance with the *Waterworks Regulations*. This permit is not transferable. This permit does not suspend, minimize, or otherwise alter this owner's obligation to comply with applicable federal, state, or local laws and regulations or permits.

This permit is an amendment of the previously issued permit dated January 27, 2023, due to addition of Spring Creek Wells 1 and 2. This revised permit is effective on the date noted on the permit and replaces and nullifies the original permit, which should be destroyed on the date the amended permit becomes effective.

You will note that the permit indicates that this waterworks is permitted for a capacity limited to 829,600 gpd. This limit is based on the maximum capacity of the system and shall not be exceeded.

Per 12VAC5-590-115 of the *Waterworks Regulations*, if you object to ODW's action, you have the right to an appeal and may send a written request for an administrative proceeding. Your request must be received no later than 30 days from the date you received this letter or the date it was mailed to you, whichever occurred first. Please use the attached form for this purpose and send it to this office.

We look forward to your continued cooperation in the maintenance and operation of this public waterworks.

Sincerely,

James Reynolds, PE
Engineering Field Director
Richmond Field Office

Enclosures:
1. Operation Permit
2. Operation Permit Conditions
3. Waterworks Description Sheet

ec: Blue Ridge Health District., attn: Environmental Health Manager, john.mcclelland@vdh.virginia.gov
Christian Goodwin, Louisa County Administrator – info@louisa.org
Building Official, Louisa County, jgrubbs@louisa.org

VDH VIRGINIA DEPARTMENT OF HEALTH

**OBJECTION AND REQUEST FOR AN ADMINISTRATIVE PROCEEDING** ***(Include for permits/amendments not requested by the owner)***

This is to advise Virginia Department of Health that I, _____,

object to the operation permit *(amendment)* proposed by Virginia Department of Health dated _____

of Waterworks Operation Permit No. _____ for _____

located in _____

and request an administrative proceeding in accordance with 12VAC5-590-115 of the *Waterworks Regulations.*

My specific objection(s) to the proposed operation permit *(amendment)* are as follows:

_____
_____
_____
_____
_____
_____
_____
_____

_____ _____
(Name) (Date)

_____
(Title)

Virginia Department of Health
Office of Drinking Water

# Waterworks Operation Permit

**The County of Louisa is hereby granted permission to operate the Louisa County Zion Crossroads waterworks, a Class 5 community waterworks located in Louisa County, in accordance with Title 32.1 of the *Code of Virginia* and the Virginia *Waterworks Regulations*, 12VAC5-590-10 *et seq*. The waterworks has a capacity of 829,600 gpd. This permit is issued with the understanding that this owner shall operate the waterworks in accordance with Part II of the Virginia *Waterworks Regulations* titled "Operation Regulations for Waterworks". This permit does not suspend, minimize, or otherwise alter this owner's obligation to comply with applicable federal, state, or local laws and regulations or permits. This permit may be revoked at any time upon written notice of revocation by the State Health Commissioner, if it is determined that The County of Louisa has failed to comply with this permit, including the Operation Permit Conditions.**

**Attachments: Operation Permit Conditions ( X ), Variances ( ), Exemptions ( )**

**PERMIT NO.: 2109990**

**EFFECTIVE DATE: February 23, 2026**

**APPROVED** _____

**James Reynolds, PE, Engineering Field Director**
**Richmond Field Office**
**for the State Health Commissioner pursuant to VA Code § 2.2-604**

# OPERATION PERMIT CONDITIONS

**Operation Permit No.:** 2109990 **Permit Effective Date:** February 23, 2026
**Waterworks Name:** Louisa County Zion Crossroads **Waterworks Class:** 5

## OPERATOR REQUIREMENTS:

A Class 5 operator shall be in attendance as necessary to perform monitoring and process evaluation, and to make any process adjustments.

## OPERATION, MONITORING, AND REPORTING:

Operation, monitoring, and reporting shall be in accordance with Title 32.1 of the *Code of Virginia* and 12VAC5-590 *et seq.* of the Virginia *Waterworks Regulations.*

## WATERWORKS CAPACITY:

**Source Capacity:**

| | |
|---|---|
| Well No. 1: | 29,600 gpd |
| Well No. 2: | 28,000 gpd |
| Well No. 3: | 35,200 gpd |
| Well No. 4: | 202,400 gpd |
| Well No. 5: | 52,000 gpd |
| Well No. 6: | 65,600 gpd |
| Well No. 7: | 139,200 gpd |
| Well No. 8 | 277,600 gpd |
| Total source capacity: | 829,600 gpd |

**Treatment Capacity:**
The following treatment is provided:

Chlorine Disinfection – Sodium Hypochlorite (voluntary)

The permitted capacity is not limited by the installed chemical feed system.

**Storage and Delivery Requirements:**
The waterworks shall provide sufficient storage and distribution pumping capacity to provide a minimum working pressure of 20 psig at all service connections.

The total available system effective storage volume is 432,220 gal which is greater than the ½ day storage of the water demand of 864,440 gpd.

**Permitted Capacity:**
This waterworks is permitted for a capacity of 829,600 gpd due to the limited source capacity.

**VIRGINIA DEPARTMENT OF HEALTH**
WATERWORKS DESCRIPTION SHEET

**DATE:** February 23, 2026

**WATERWORKS NAME:** Louisa County Zion Crossroads **WATERWORKS CLASS:** 5

**COUNTY/CITY:** Louisa County **TYPE:** Community

**LOCATION:** This waterworks is located on the north side of the I-64 and Route 15 interchange in Louisa County

**OWNER:** County of Louisa
P. O. Box 160
Louisa, VA 23093
**Phone:** 540-967-0401

**OPERATOR:** Licensed Class 5 Operator Required

**PERMIT NUMBER:** 2109990

**TYPE OF TREATMENT:** Disinfection

**SOURCE:** Eight Drilled Wells

**DESIGN CAPACITY:** 829,600 gpd

## DESCRIPTION OF SYSTEM

The Louisa County Zion Crossroads waterworks consists of eight drilled wells, three treatment/control buildings, one 500,000 gallon elevated storage tank and a distribution system that serves the Zion Crossroads area of Louisa County.

**Well No. 1 (Poore Well No. 1):** is located on the Poore property approximately 1.3 miles west of County Road 613 on the north side of I-64. The well was drilled in April 1999 to a total depth of 325 feet. The well is cased with 8-inch diameter PVC well casing to a depth of 60 feet and grouted with neat cement grout to a depth of 50 feet. The well casing extends 12 inches above 6-foot by 6-foot by 6-inch-thick concrete pad and is equipped with a pitless adapter, watertight well cap, and screened casing vent. A raw water sample tap and totalizing flow meter are located in the treatment building. Water is pumped from the well into the distribution system via a 7.5 hp submersible well pump capable of delivering 31 gpm at 475 feet TDH. The reliable well yield is 37 gpm following a 48-hour pump test performed in April 1999.

**Well No. 2 (Poore Well No. 2):** is located on the Poore property approximately 1,200 feet north of Well No. 1. The well was drilled in April 1999 to a total depth of 225 feet. The well is cased with 8-inch diameter PVC well casing to a depth of 55 feet and grouted with neat cement grout to a depth of 50 feet. The well casing extends 12 inches above a 6-foot by 6-foot by 6-inch-thick concrete pad and is equipped with a pitless adapter, watertight well cap, and screened casing vent. A raw water sample tap and totalizing flow meter are located in the treatment building. Water is pumped from the well into the distribution system via a 7.5 hp submersible well pump capable of delivering 31 gpm at 470 feet TDH. The reliable well yield is 35 gpm following a 48-hour pump test performed in April 1999.

**Well No. 3 (Green Springs Well No. 3):** is located on the east side of Route 15 approximately 2.5 miles north of I-64 at Zion Crossroads. The well was drilled in August 2001 and is 8 inches in diameter to a total depth of 400 feet. The well is cased with 8-inch diameter steel casing to a depth of 120 feet and grouted with neat cement grout to a depth of 50 feet. The well casing extends 12 inches above 6-foot by 6-foot by 6-inch-thick concrete pad and is equipped with a pitless adapter, watertight well cap, and screened casing vent. A raw water sample tap and totalizing flow meter are located in the treatment building. Water is pumped from the well into the distribution system via a 10 hp submersible well pump capable of delivering 40 gpm at 610 feet TDH. The well yield following a 48-hour yield test in November 2001 was 40 gpm with a drawdown of 194.5 feet. The well yield following 24-hour, multiple well stress test conducted between January 14-15, 2004 indicated a yield of 44 gpm with a stabilized drawdown of 250 feet.

**Well No. 4 (Green Springs Well No. 4):** is located on the east side of Route 15 approximately 2.5 miles north of I-64 at Zion Crossroads. The well was drilled in August 2001 and is 12 inches in diameter to a depth of 55 feet and 8 inches in diameter from 55 feet to a total depth of 500 feet. The well is cased with 8-inch diameter PVC casing to a depth of 55 feet and is grouted with neat cement grout to a depth of 50 feet. The well casing extends 12 inches above a 6-foot by 6-foot by 6-inch-thick concrete pad and is equipped with a pitless adapter, watertight well cap, and screened casing vent. A pressure gauge and airline are provided for measuring the depth of the water in the well. A totalizing flow meter, blow-off and finished water sample tap are located in the treatment building adjacent to Well No. 3. A lockable freeze proof hydrant is used for a raw water sample tap. Water is pumped from the well into the distribution system via a 50 hp submersible well pump capable of delivering 225 gpm at 680 feet TDH. The well yield following a 48-hour yield test in November 2001 was 221 gpm with a drawdown of 214.9 feet. The well yield following 24-hour, multiple well stress test conducted between January 14-15, 2004 indicated a yield of 253 gpm with a stabilized drawdown of 265 feet.

**Well No. 5 (Green Springs Well No. 5):** is located on the east side of Route 15 approximately 2.5 miles north of I-64 at Zion Crossroads. The well was drilled in August 2001 and is 12 inches in diameter to a depth of 60 feet and 8 inches in diameter from 60 feet to a total depth of 600 feet. The well is cased with 8-inch diameter PVC casing to a depth of 60 feet and is grouted with neat cement grout to a depth of 50 feet. The well casing extends 12 inches above a 6-foot by 6-foot by 6-inch-thick concrete pad and is equipped with a pitless adapter, watertight well cap, and screened casing vent. A pressure gauge and airline are provided for measuring the depth of the water in the well. A totalizing flow meter, blow-off and finished water sample tap are located in the treatment building adjacent to Well No. 3. A lockable freeze proof hydrant is used for a raw water sample tap. Water is pumped from the well into the distribution system via a 20 hp submersible well pump capable of delivering 55 gpm at 790 feet TDH. The well yield following a 48-hour yield test in November 2001 was 54.4 gpm with a drawdown of 245.9 feet. The well yield following 24-hour, multiple well stress test conducted between January 14-15, 2004 indicated a yield of 65 gpm with a stabilized drawdown of 390 feet.

**Well No. 6 (Spring Creek Well SC-1):** The well was drilled by Foster Well & Pump Co. Inc and completed on April 13, 2002. It was drilled to a total depth of 605 feet. The hole diameter was 12 inches to a depth of 103 feet and 8 inches to a depth 605 feet. It was cased with 8-inch steel casing from 2 feet above grade to 103 feet below grade. The well was grouted with neat cement from grade to a depth of 103 feet. A 7-feet x 7-feet x 8 inches thick concrete apron will be placed around the well casing. The well will be equipped with a pitless adapter and a vented well cap.

A 48-hour yield and drawdown test was conducted by Golder Associates Inc on January 13-15, 2004. The initial static water level was 28.75 feet. The pumping rate was set at 82 gpm and the drawdown level was 229.92 feet.

A submersible well pump powered by a 10-HP 3-phase electric motor, will be installed which will have a rated capacity of 79 gpm @ 373 feet TDH. The well pump intake will be set at a depth of 357 feet below grade. The well pump discharge piping will be equipped with a screened air release valve, a sample tap, a swing check valve, a 4-inch turbine meter, a common blow off, and 2 gate valves. The well pump will be controlled by the water level in the existing elevated tank.

**Well No. 7 (Spring Creek Well SC-2):** The well was drilled by Foster Well & Pump Co. Inc and completed on April 13, 2002. It was drilled to a total depth of 605 feet. The hole diameter was 12 inches to a depth of 82 feet and 8 inches to a depth of 605 feet. It was cased with 8-inch steel casing from 2 feet above grade to 82 feet below grade. The well was grouted with neat cement from grade to a depth of 82. A 7-feet x 7-feet x 8 inches thick concrete apron will be placed around the well casing. The well will be equipped with a pitless adapter and a vented well cap.

A 48-hour yield and drawdown test was completed by Golder Associates Inc on January 13-15, 2004. The initial static water level was 7.89 feet. The pumping rate was set at 174 gpm and the drawdown level was 155.11 feet.

A submersible well pump powered by a 30-HP 3-phase electric motor, will be installed which will have a rated capacity of 175 gpm @ 508 feet TDH. The well pump intake will be set at a depth of 2l0 feet below grade. The well pump discharge piping will be equipped with a screened air release valve, a sample tap, a swing check valve, a 6-inch turbine meter, a common blow off, and 2 gate valves. The well pump will be controlled by the water level in the existing elevated tank.

**Well No. 8 (Spring Creek Well SC-3):** is located approximately 3,000 feet east- northeast of the intersection of Route 15 and State Route 617, approximately 2.5 miles north of I-64 at Zion Crossroads. The well was drilled in April 2002 to a total depth of 590 feet. The well is cased with 8-inch diameter heavy steel casing to a depth of 83 feet and grouted with neat cement grout to a depth of 83 feet. The well casing extends 12 inches above a 6-foot by 6-foot by 6-inch-thick concrete pad and is equipped with a pitless adapter, watertight well cap, and screened casing vent. A raw water sample tap and totalizing flow meter are located in the treatment building. Water is pumped from the well into the distribution system via a 50-hp submersible well pump capable of delivering 320 gpm at 459 feet TDH. A 48-hour yield test conducted in April 2002 indicated a yield of 340 gpm with a stabilized water level of 157.11 feet. The well yield following a subsequent 48-hour multiple well stress test conducted between January 13-15, 2004 indicated a yield of 347 gpm with a stabilized drawdown of 157 feet.

**Treatment:** Chlorination is provided for all eight wells.

Well Nos. 1 and 2: Equipment consists of one solution feed metering pump and one 15-gallon polypropylene solution tank for each well. Each metering pump is capable of delivering a maximum of 1.6 gallons per hour (38.4 gpd). The chemical feed equipment, totalizing flow meters for each well, sample taps, and associated valves and controls are housed in a 20-foot by 12-foot by 8 feet tall treatment building located adjacent to Well No. 1. Following treatment, both wells discharge directly into the distribution system with excess going to the 500,000-gallon elevated water storage tank.

Well Nos. 3, 4, & 5: Equipment consists of one solution feed metering pump and one 15-gallon polypropylene solution tank for each well. Each metering pump is capable of delivering a maximum of 1.6 gallons per hour (38.4 gpd). The chemical feed equipment, totalizing flow meter, sample tap, and associated valves and controls are housed in a 21 foot by 21 foot by 8 foot tall treatment building located adjacent to the Well No. 3. Following treatment, all wells discharge into the distribution system with excess going to the 500,000 gallon elevated water storage tank.

Well No. 6, 7, & 8: Equipment consists of one solution feed metering pump and one 15-gallon polypropylene solution tank for Well Nos. 7 and 8. Well No. 7 and 8 are alternated. Another solution feed metering pump and one 15-gallon polypropylene solution tank metering pump is capable of delivering a maximum of 1.6 gallons per hour (38.4 gpd) for well No. 6. Both solution feed systems are controlled a signal from the respective well pumps. The chemical feed equipment, respective totalizing flow meter for each well, sample taps, and associated valves and controls are housed in a 20 foot by 20 foot by 8 foot tall treatment building. Following treatment, the well discharges into the distribution system with excess going to the 500,000 gallon elevated water storage tank.

**Storage:** The elevated tank, located on the north side of Interstate 64 and the east side of Route 15, is a spheroidal design with a total storage capacity of 500,000 gallons and a head range of 37.6 feet. A hydraulic model of effective storage developed by Dewberry and dated January 9, 2023, indicates the effective storage capacity for the tank is 432,220 gallons. The base of the tank rests on a single pedestal 100 feet above the ground surface (632.29 feet elevation) and the overall height of the tank is 147 feet. The overflow elevation for the tank is 669.79 feet and the normal maximum operation water elevation is 669.29 feet. Minimum storage elevation for fire flow at 500 gpm for 2 hours is 642.29 feet. A 24 inch in diameter steel inlet/outlet pipe terminates inside the bottom of the tank to form a silt stop. Tank appurtenances include an 8-inch diameter screened steel overflow pipe with flap gate discharging onto a splash pad at grade level; an 8-inch diameter screened drain with valve at the lower platform discharging onto a splash pad at grade level; a 24-inch diameter watertight shoebox-type access hatch at the top; a 24-inch diameter ventilation hatch; fixed ladders inside the pedestal shaft and access tube; a mushroom type roof vent; and interior lighting.

## WATERWORKS CAPACITY

1. Estimated Water Demand:
   Per inspection done on April 3, 2023, the average daily demand is 231,053 gpd

2. Source Capacity:

| Well Name | Well Yield[1] | | Well Pump[2] | | Limiting Capacity |
|---|---|---|---|---|---|
| Well No. 1 | 37 gpm | 29,600 gpd | 31 gpm | 44,640 gpd | 29,600 gpd |
| Well No. 2 | 35 gpm | 28,000 gpd | 31 gpm | 44,640 gpd | 28,000 gpd |
| Well No. 3 | 44 gpm | 35,200 gpd | 40 gpm | 57,600 gpd | 35,200 gpd |
| Well No. 4 | 253 gpm | 202,400 gpd | 225 gpm | 324,000 gpd | 202,400 gpd |
| Well No. 5 | 65 gpm | 52,000 gpd | 55 gpm | 79,200 gpd | 52,000 gpd |
| Well No. 6 | 82 gpm | 65,600 gpd | 79 gpm | 113,760 gpd | 65,600 gpd |
| Well No. 7 | 174 gpm | 139,200 gpd | 175 gpm | 252,000 gpd | 139,200 gpd |
| Well No, 8 | 347 gpm | 277,600 gpd | 320 gpm | 460,800 gpd | 277,600 gpd |
| Total | | | | | 829,600 gpd |

[1] gpd= (gpm)(1,440 min/day)/1,8 SF [2] gpd = (gpm)(1,440 min/day)

3. Treatment Capacity: The permitted capacity is not limited by the installed chlorination systems.

4. Storage Capacity:

   The 500,000 gallon elevated storage tank has an effective volume of 432,220 gallons. (This is based upon a hydraulic model of effective storage performed by the firm of Dewberry Engineers, Inc., dated January 9, 2023, showing that a minimum tank level of 10 feet is necessary to maintain 20 psi within the distribution system under maximum day domestic demands, plus fire flow conditions).

   (432,220 gal)/0.5 day storage= 864,440 gpd

CONCLUSION:

This waterworks is permitted for a capacity of 829,600 gpd due to the limited source capacity.

## OPERATION PERMIT HISTORY

| Permit Issuance (Effective Date) | Description / Reason[1] |
|---|---|
| July 14, 2006 | Initial Issuance |
| January 27, 2023 | Deletion of pH and sequestering treatment (corrosion control not installed). |
| February 23, 2026 | Updated Permitted Capacity by Adding Spring Creek Wells 1 & 2. |

# OPERATION PERMIT TRANSMITTAL CHECKLIST

| | | | |
|---|---|---|---|
| DATE: | **2-19-2026** | FROM: | **Azhar N. Mirza** |
| PWSID #: | **2109990** | CITY/COUNTY: | **Louisa County** |
| WATERWORKS NAME: | **Loisa County Zion Crossroads** | | |
| PERMIT ACTION: | **AMENDED** | | |

| ENCLOSURES: (Check all that apply) | | |
|---|---|---|
| | **X** | OPERATION PERMIT AND OPERATION PERMIT CONDITIONS |
| | **X** | WATERWORKS DESCRIPTION SHEET |
| | **NA** | VARIANCE, EXEMPTION, or TEMPORARY PERMIT REQUIREMENTS (CIRCLE) |
| | **NA** | PERMIT APPLICATION |
| | **NA** | ENGINEER'S STATEMENT OF COMPLETION |
| | **X** | FINAL INSPECTION REPORT |
| | **NA** | NEW/REVISED CDS SCHEMATIC #_____ |
| | **NA** | APPLICATION FOR METERING VARIANCE |
| | **NA** | OTHER (LIST): |

| OTHER | NOT REQUIRED | APPROVED - DATE | NOT APPROVED - EXPLAIN |
|---|---|---|---|
| WBOP | | **1-19-2022** | |
| LICENSED OPERATOR | | **X** | |
| CCCP | | **3-10-2015** | |
| BSSP | | **2-06-2026** | |
| DDBP SAMPLING PLAN | | **2-23-2026** | |
| LCR SAMPLING PLAN | | **6-18-2008** | |

| GUDI DETERMINATION | DATE | GUDI | NOT GUDI |
|---|---|---|---|
| WELL Nos. 1 to 5 | **12-16-2017** | | **X** |
| Well No. 6 | **8-09-2006** | | **X** |
| Well Nos. 7 & 8 | **8-08-2022** | | **X** |

| RELIABILITY VERIFICATION | SATISFACTORY | UNSATISFACTORY[1] |
|---|---|---|
| WATER QUALITY | **X** | |
| HYDRAULIC CAPACITY (Adequate Pressure, Leakage, Water Outages, etc.) | **X** | |

| Field Office QA/QC | Initials |
|---|---|
| Document Author | ANM |
| Reviewer | TS |
| Final Check | JR |

| FD Final Check | | Temporary Permit Requirements |
|---|---|---|
| | X | Operation Permit Conditions |
| | X | Capacity Evaluation |
| | X | Permitted Capacity |

COMMENTS: