

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 94-8142

Exam Date: 06/17/2020

1. Current Owner:

MURRAY WATER ASSN 115 WALT ALMQUIST AVENUE MURRAY ID 83874

2. Accompanied by: Steve Hale & Mrs. Leslie Abrams-Rayner

Phone No: 208-682-9962 & 208-929-1045

Address: Steve Hale - 6518 Prichard Creek ST, Murray ID 83874

Relationship to permit Holder: Steve Hale – VP, Murray Water Assn INC

Leslie Abrams-Rayner – General Manager, Gem State Water (water operator)

3. **SOURCE:**

GROUND WATER

Method of Determination: Arcmap and DRG

B. OVERLAP REVIEW

1. Other water rights with the same place of use:

YES Overlap

Water Right No.	Source	Purpose of Use	Basis
94-7379	GOLD RUN CREEK	DOMESTIC	LICENSE – PARTIAL DECREEED IN CSRBA
94-8260	GROUND WATER	DOMESTIC	Beneficial Use Claim – PARTIAL DECREEED IN CSRBA
94-8289	GROUND WATER	DOMESTIC	Beneficial Use Claim – PARTIAL DECREEED IN CSRBA
94-8319	GROUND WATER	DOMESTIC	Beneficial Use Claim – PARTIAL DECREEED IN CSRBA
94-8320	GROUND WATER	DOMESTIC	Beneficial Use Claim – PARTIAL DECREEED IN CSRBA

Comments: Right(s) 94-7379, 94-8260, 94-8289, 94-8319, and 94-8320 are all domestic use rights that collectively account for seven homes water uses (94-8289 services 3 homes) located within the service area POU for this water right. Combined these five rights account for 7 of the 11 total homes not connected to Murray Water Association's municipal water services. The homes associated with these five rights were not service connected at time of field exam, and are not a concern for overlap with right 94-8142.

2. Other water rights with the same point-of-diversion:

NO Overlap

Water Right No.	Source	Purpose of Use	Basis

Comments: _____

C. DIVERSION AND DELIVERY SYSTEM1. **LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER NE¼ NE¼, Sec. 6, Twp 49N, Rge 05E, B.M. SHOSHONE County

Method of Determination: GPS; well 94-93-N-23-000 is located at -115°51.513, 47°37.674

PLACE OF USE: MUNICIPAL

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
49N	05E	5					X	X	X	X									
49N	05E	6	X	X		X													

Method of Determination: Field exam and Arcmap aerial imagery.

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
- ☒ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☒ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☒ Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
94-93-N-23-000		5			

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
NONE						

2. Measurements: Water main line routed directly from well to pressure tanks without adequate pipe requirements to complete a flow measurement.

E. FLOW CALCULATIONS☒ Additional Computation Sheets Attached

Measured Method: Theoretic pumping equation derives a flow rate of 50.4 gpm, with the 5hp pump installed at a depth of 210 feet and 45 PSI operating pressure. Field exam photograph taken of the water system's engineering report (excerpt - see backfile photographs) validates this value with their "Maximum Tested Yield" equal to 50 GPM. 50.4 gpm equates to 0.11 cfs considering department rounding standards.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation: N/A

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

$$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 =$$

$$V = \text{Smaller of } V_{IR} \text{ and } V_{DR} =$$

2. Volume Calculations for Other Uses:

$$\text{Municipal annual volume \& Maximum diversion volume} = 41 \text{ service connections} \times 0.6 \text{ af (per home)} = \mathbf{24.6 \text{ af}}$$

G. NARRATIVE/REMARKS/COMMENTS

Field exam performed on 6/17/2020 with the applicant's representative, Steve Hale – VP Murray Water Assn, and the systems water operator, Leslie Abrams-Rayner – General Manager with Gem State Water, showed one well providing groundwater for municipal purposes for Murray Water Assn. At the POD, ground water well 94-93-N-23-000 used a 5hp pump to divert water directly to pressure tanks before routing via water lines in the service area. I was unable to perform a flow measurement due to inadequate pipe requirements. A theoretic pump equation was calculated deriving a flow rate equal to 50.4 gpm or 0.11 cfs, considering department rounding standards. A hard copy of the water system's engineering report was available for review during the field exam. A photograph was taken of the system's 'Source Facilities', which discussed well information. In the report, the 5hp pump was tested and shown to have a "Max. Tested Yield" of 50 GPM. Based on this information and the theoretic pump equation, **0.11 cfs** is recommended for licensing purposes.

During the exam, photographs of several lots within the service area were taken; the municipal POU consists of multiple historic buildings, two restaurants, a county maintenance shop facility, and numerous residential homes. In speaking with Mr. Hale, it was annotated that there are 41 service connections and 11 separate homes that are not associated with the water system. Of the 41 service connections, 19 were identified as full time residences, and the remaining 22 were homes that were more seasonal use residents. While conducting the field exam, minimal irrigation was found to be occurring around the small lots and businesses in the service area. Based on these considerations, in home water usage is the primary municipal water use on an annual basis. Arcmap aerial imagery was used to trace out the municipal POU, which consists of numerous small government lots likely tied to historic mining claims. The numerous government lots were not annotated in ADHOC, rather the broader section, township, and range legal conforming to municipal legal descriptions were used to detail the POU for licensing purposes.

Following the exam volume data was requested from Mrs. Leslie Abrams-Rayner, Murray Water Assn's system operator. The City of Murray had contracted with a different water operator during the majority of the permit's development period (2013-2018). Leslie is the general manager at Gem State Water, and assumed management of the municipal system in 2018. Leslie provided data from April 2018 to 2020, but calculating a quality annual volume for any portion of that time proved unreliable due to several large scale leaks that occurred with the water system during the periods volume data was tracked. The prior water operator did not practice good volume reporting, and prior to 2018 volume data is inconclusive. As a result, the annual volume was derived using the calculation $41 \text{ homes} \times 0.6 \text{ af per home} = \mathbf{24.6 \text{ af}}$, which is recommended as the maximum diversion volume for licensing. This value is slightly larger than one of the metrics derived from 2018-2020 volume data, but provides allowances for the 22 homes with historic seasonal water usage to divert on a more full time basis in future years.

Leslie identified that Murray Water Assn was in the process of applying for grant money to update the aging system's infrastructure, which if secured and developed will reduce water volume loss due to leaks, making the water system more efficient. At that time, or if Murray Water Assn grows in service connection requirements, and the 24.6 af recommended for licensing of this permit does not meet the service demands a new application for permit will be required.

Conditions 26A, 134, and 046 were removed from the permit during licensing review. Condition 126 was updated to reflect Murray Water Assn's water system No. ID1400039. All other conditions on the permit will remain on the license. Overlap concerns: Right(s) 94-7379, 94-8260, 94-8289, 94-8319, and 94-8320 are all domestic use rights that collectively account for seven homes water use (94-8289 services 3 homes) located within the service area POU for this water right. Combined

these five rights account for 7 of the 11 total homes not connected to Murray Water Assn INC.'s municipal water services. The homes associated with these five rights were not service connected at time of field exam, and are not a concern for overlap with right 94-8142. There are no additional overlap concerns for this right.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
MUNICIPAL	01/01 to 12/31	0.11 CFS	24.6 AF

Totals: 0.11 CFS 24.6 AF

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☒ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☒ None

I. AUTHENTICATION

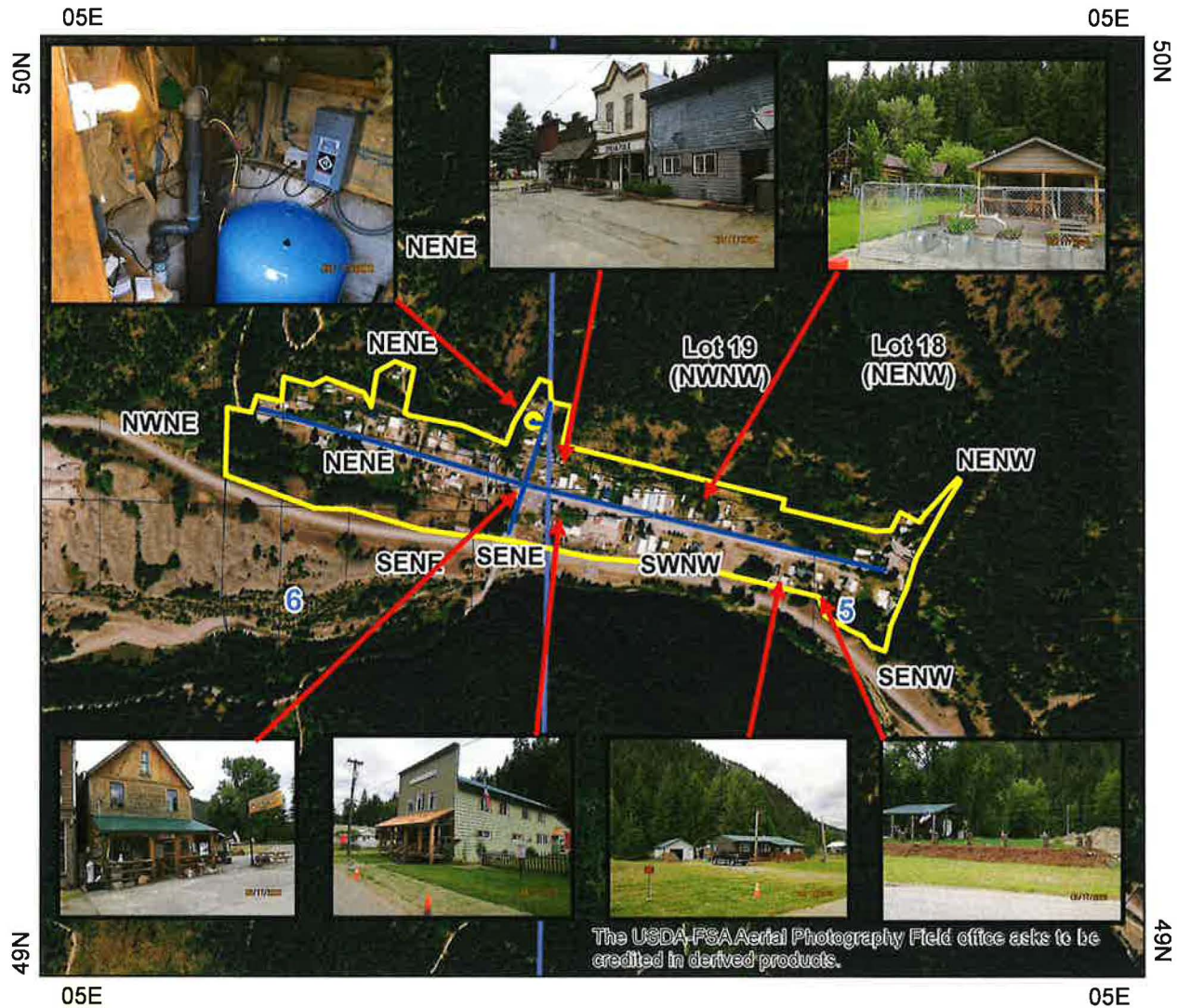
Luke Bates - Water Resource Agent

Field Examiner's Name LSB Date 2/2/2021

Reviewer Adam Franklin Date 2/2/2021

State of Idaho
Department of Water Resources
Attachment to Field Exam
94-8142

MUNICIPAL system diagram.



- Point of Diversion
- Water Service Area Boundary
- Townships
- PLS Sections
- Quarter Quarters

0 0.1 0.2 0.4 Miles



THEORETICAL PUMPING EQUATION FOR WR# 94-8142

Theoretical Pumping Equation is required because system did not allow for a proper measurement. Pump is estimated to be at 210 ft, and running at 45 psi.

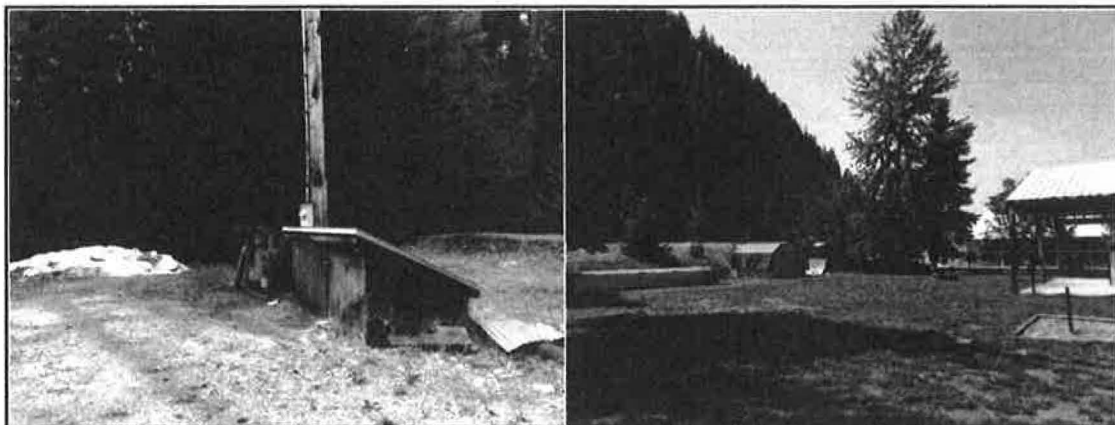
PUMP EQUATIONS

WATER RIGHT No. 94-8142

94-93-N-23-000	HP	H in feet	Efficiency as a decimal	Pumping lift in feet	System pressure in PSI
Q = HP*8.8*Eff/H	5	314.0816	0.8	210	45
Q = 0.112 cfs 50.4 gpm					

Murray Water Association Drinking Water Facility Plan

Revision 3, Final



Prepared for:
Murray Water Association

January 28, 2020

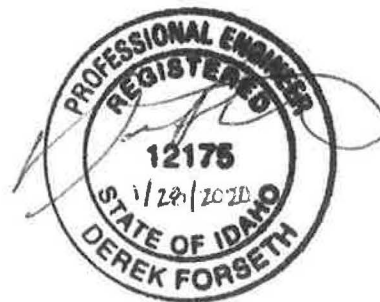
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Acronyms and Abbreviations

ADD	Average day demand
AACE	Association for the Advancement of Cost Engineering
Alta	Alta Science & Engineering, Inc.
CAS	Compliance Agreement Schedule
CDA	Coeur d'Alene
CWA	Clean Water Act
DWFP	drinking water facility plan
DO	dissolved oxygen
ECWAG	Emergency Community Water Assistance Grants
EDU	equivalent dwelling unit
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HP	horsepower
IDEQ	Idaho Department of Environmental Quality
IPaC	Information for Planning and Consultation
IOC	inorganic chemicals
LEP	Limited English Proficiency
LCR	Lead and Copper Rule
MDD	maximum day demand
MPA	microscopic particulate analysis
Murraysmith	Murraysmith, Inc.
MWA	Murray Water Association
NRCS	Natural Resources Conservation Services
NWI	National Wetland Inventory
O&M	operations and maintenance
PHD	peak hourly demand
PVC	poly-vinyl chloride

2.2.17 Socioeconomic Profile

The town population estimates for Murray are not available from the United States Census Bureau because the census estimates are grouped together with a larger geographic area that includes the City of Wallace and other small communities. However, conversations with locals indicate a full time population of fewer than 100 residents. The 2014 sanitary survey states there were 35 people in Murray (Appendix E).

The Limited English Proficiency website (LEP 2019), states that Shoshone County population has between 5 and 10% LEP based on the most recent data, from 2015.

2.3 Existing Drinking Water System Information

The water system for the town is owned and operated by the MWA, a non-profit organization.

2.3.1 Site and Infrastructure

The sole water source supplying the community of Murray is a well located on a small MWA-owned lot on the west side of Walt Almquist Avenue, north of Prichard Creek Road (Figure 2). The well was drilled in 1993 and is 245 feet deep. Attachment B in Appendix A contains the well log under the name Almquist). There is one pressure zone controlled by two captive air (bladder) 80-gallon tanks.

The MWA property contains a partially underground pump house that includes the well and two pressure tanks, a generator for use during power loss, a power pole, and a gravel driveway. The 2014 sanitary survey describes the area surrounding the well (Appendix E). Photographs of the lot and pump house are provided in Appendix F.

MWA does not have any well operations and maintenance (O&M) records (MWA, personal communication 8/11/2018). The well is in good condition; MWA and the 2014 sanitary survey found no issues with the well.

The previous pump in the well was a McDonald 40-gpm submersible pump with a like-kind 5-horsepower (HP) motor, and was installed on May 7, 2014 at a depth of approximately 210 feet. The pump was replaced on November 4, 2016 at a cost of approximately \$5,500. There are no records of pumping schedules (daily, weekly, monthly, or seasonally). The pump runs when customers use water.

The existing distribution system consists of approximately 4,000 feet of 4-inch poly-vinyl chloride (PVC) pipe, located along Prichard Creek Road, and has 32 connections (see Figure 7 and Appendix G). The distribution system existed prior to the well installation, and had numerous leaks. The western half of the distribution line was replaced by 2001 and the eastern half of the line was replaced by November 2002, fixing many leaks. The elevation at the well site is approximately 30 feet higher than the lowest portions of the distribution system. The water is not treated prior to distribution to the customers. There are no well or distribution O&M records (MWA, personal communication 8/11/18). The system periodically loses pressure; there are no records for dates/times of the pressure losses or households affected (MWA, personal communication 8/11/2018). As noted in Section 2.3.4, the pressure loss is thought to be due to a decline of water in the well and leaks in the distribution line.

There is no cross-connection control program, but the system has a backflow prevention.

A sanitary survey was last conducted on August 15, 2014 (Appendix E).

Appendix E
Most Recent Sanitary Survey

- 2) There was exploratory excavation in June 2014 over the distribution system on the south side of Prichard Creek Road to investigate a potential leak. No leak was identified in this portion.

Monitoring and Reporting

- 1) A monthly source sampling schedule for *E. coli* was required in response to the inability to abandon nearby sanitary sewer home seepage pits located on adjacent properties.

System Management and Operation

- 1) Complaint investigations were conducted by the Department in 2014 relating to pressure and water quality. A town meeting was held in August 2014 to discuss problems in the water system.
- 2) Negotiations were initiated in August 2014 between Arlen Lish and water system users to discuss a transfer of ownership in Murray Water Works.

Operator Compliance with State Requirements

- 1) The system was disapproved by the Department in June 2014 for lacking a certified operator.

SOURCE FACILITIES

Well #1

Original Construction Date: July 28, 1993 **Well Log:** Permit #94-93-N-23-000
Total Depth: 245 FT **Casing:** 6 IN x 34 FT **Intake:** Open Bottom
Static Level: 20 FT **Pump:** 5 HP @ 40 GPM **Max. Tested Yield:** 50 GPM
Lat / Long: 47.62790 / -115.85851 **TRS:** T49N R5E S6
Surface Seal: 34 FT, Bentonite **Confining Layers:** Hard shale at multiple levels
Modified: No modifications known

Well #1 is located on a small lot fronting Walt Almquist Avenue, and the well site is owned by the water system. The general area surrounding the well consists of developed residential lots and undeveloped land to the west. A 50-foot isolation zone around the well contains the pump house structure, a utility pole, a gravel roadway, adjacent property lines, and a residential dwelling to the north. A 100-foot isolation zone around the well additionally contains four residential dwellings and at least two sanitary sewer home seepage pits. Topography is moderately sloped from north to south in the immediate vicinity of the well, and it is steeply sloped in the greater surrounding area. The well site is approximately 30 feet higher in elevation than the lowest portions of the service area.

Well #1 is located inside the well house structure. The top of the well casing projects above the foundation walls and surrounding ground surface. The well is capped with a split-cap seal featuring a screened vent, top-mounted discharge piping, and caulk sealant around the pump wire entrance. There were no apparent gaps or cracks leading into the well casing. Well discharge piping features galvanized iron and PVC fittings, a master flow meter, a pressure gauge, a

pressure switch, two captive air (bladder) tanks, pipe unions, a check valve, and an isolation valve. A threaded hose bib tap near the floor is available for entry point sampling and it can serve as a means of discharging to waste through a garden hose. The discharge piping conveys water directly to the distribution system.

The well house structure consists of one partially-buried unit with poured concrete walls, a concrete floor with drain, and wood framing above grade. The structure generally appears to direct local runoff away, provide adequate protection from the weather, and prevent unauthorized access. The well house is minimally sized for the existing equipment, and it appears to have a limited capacity for the installation of additional water system appurtenances.

The well was first evaluated in March 2001 for the influence of surface water using the Ground Water Under the Direct Influence (GWUDI) process on the source. Department files indicate setbacks, a field survey, and proximity to Alder Creek (approximately 100 feet) formed the basis of an initial determination that the source required further evaluation. Results from one micro-particulate analysis (MPA) conducted in June 2008 indicated the presence of one primary indicator at low levels and the presence of six secondary indicators at low levels. Because of the zero risk factor determined by the analyzing laboratory, the well source was determined to be ground water by the Department in the sanitary survey dated July 9, 2008.

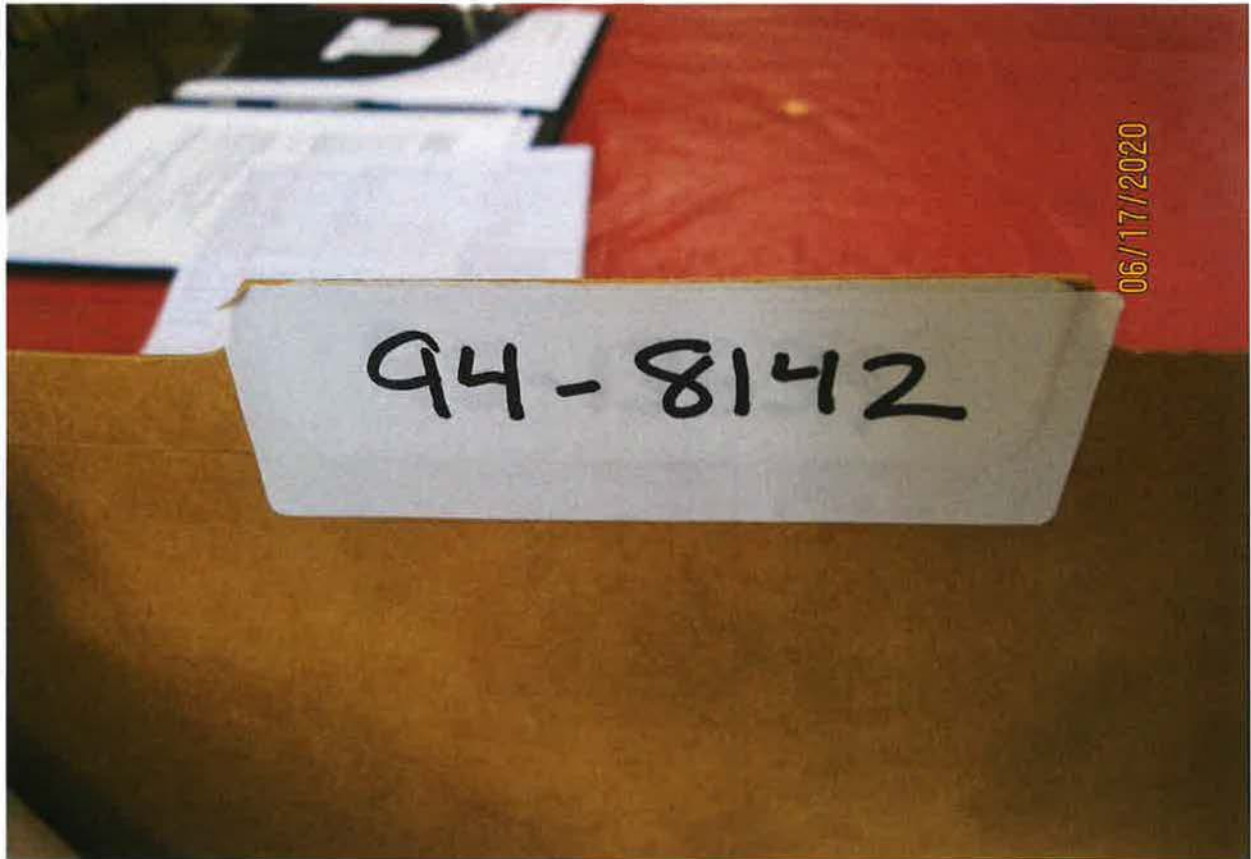
Source deficiencies were noted at the time of inspection:

The well must be located a minimum of 50 feet from any potential source of contamination. A corroding 55-gallon drum with contents that appear to be diesel is located within approximately ten feet of the well and well house. Address the deficiency by removing the drum, the fuel, and all other waste containers from the well site. IDAPA 58.01.08(900)(01)

A permanent means for measuring water level within the casing must be provided. Well #1 does not have the means to measure water levels within the casing, and there are indications that the water level may be fluctuating below the current pump intake under prolonged pumping. At the time of the next Material Modification, address the deficiency by installing the means to measure water levels in the casing under both static and pumping conditions. IDAPA 58.01.08(511)(06)(c)

A community water system served by ground water with any sources constructed after July 1, 1985 shall have a minimum of two sources. The water system has only one ground water source (constructed in 1993). At the time of the next Material Modification, address the deficiency by constructing a redundant source under these requirements. Prior to any proposed construction, consult with the Department for review and approval requirements. IDAPA 58.01.08(513)(02)

Sources of contamination must be in compliance with minimum setback distances from a public water system well. Well #1 is less than 50 feet from adjacent property boundaries and less than 100 feet from two individual home seepage pits. Monitor the deficiency by collecting a monthly *E. coli* biological sample from Well #1 as long as the condition remains. At the time of the next Material Modification, address the deficiency by ensuring adequate setback distances to the source under these requirements. IDAPA 58.01.08(510)(02)



POD - WELL 94-93-N-23-000



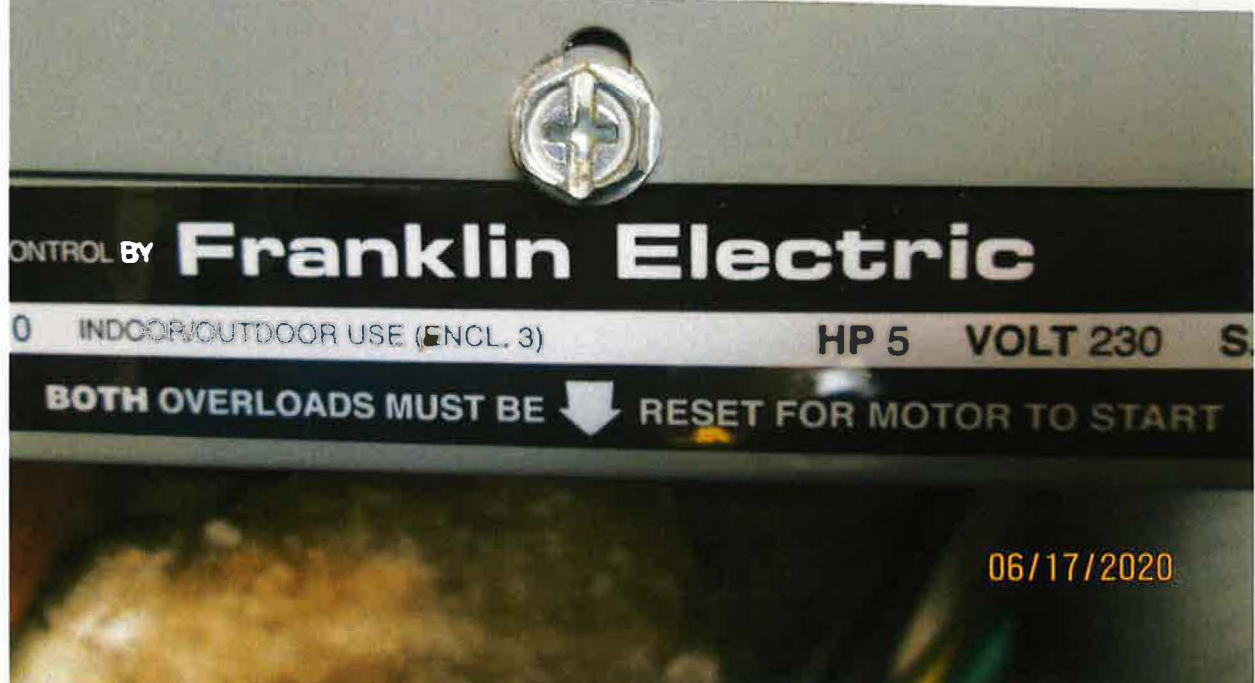
PUMP HOUSE CONTAINING PRESSURE TANK FOR WATER SYSTEM

METAL PARTS HAVE BEEN PROPERLY GROUNDED
ACCORDING TO APPLICABLE CODES.

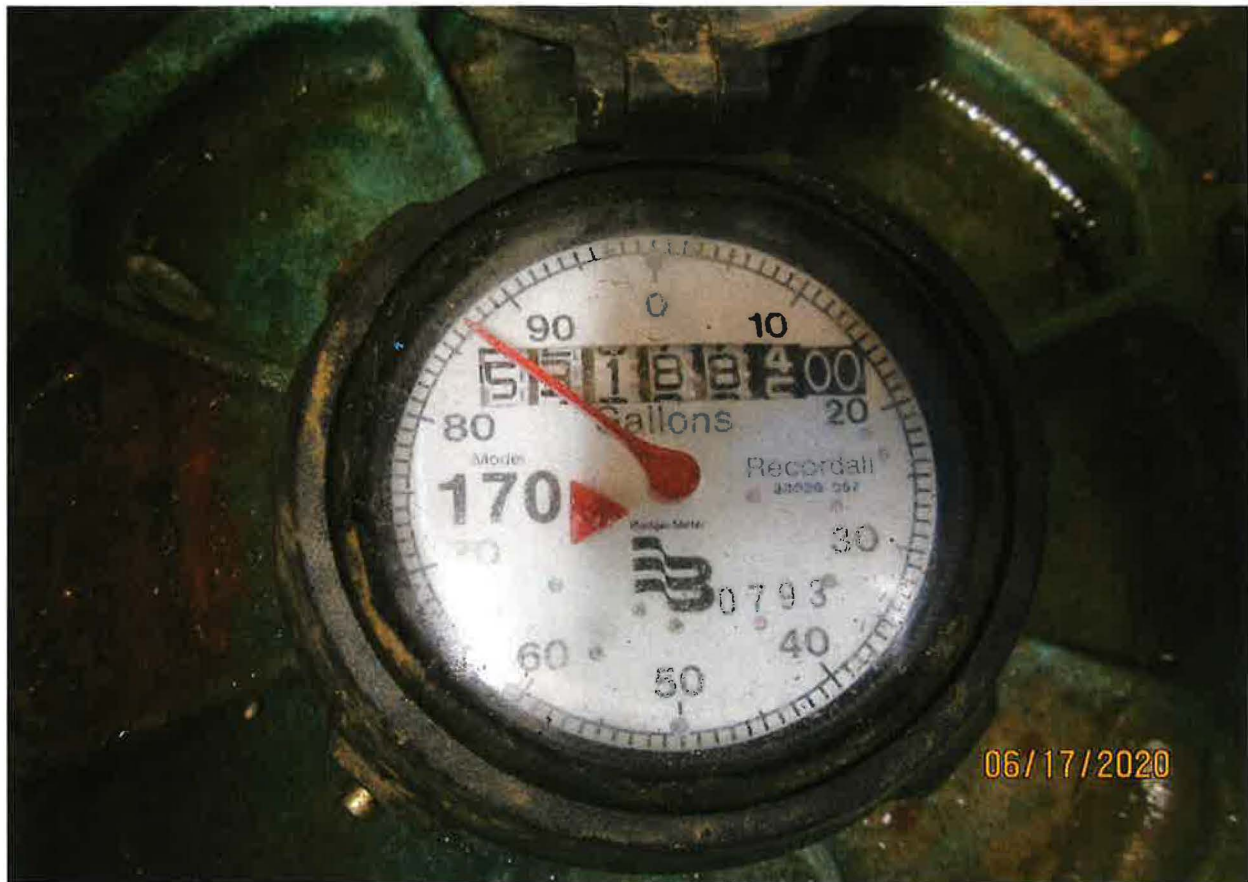
155661101 RE



Franklin Electric
Bluffton, Indiana 48714



5 HP WELL PUMP



FLOW METER INSTALLED ON SYSTEM

Operator Compliance with State Requirements

- 1) The system was disapproved by the Department in June 2014 for lacking a certified operator.

SOURCE FACILITIES

Well #1

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Lat / Long: 47.62790 / -115.85851	Max. Tested Yield: 50 GPM
Surface Seal: 34 FT, Bentonite	TRS: T49N R5E S6
Modified: No modifications known	Confining Layers: Hard shale at multiple levels

Well #1 is located on a small lot fronting Walt Almquist Avenue, and the well site is owned by the water system. The general area surrounding the well consists of developed residential lots and undeveloped land to the west. A 50-foot isolation zone around the well contains the pump house structure, a utility pole, a gravel roadway, adjacent property lines, and a residential dwelling to the north. A 100-foot isolation zone around the well additionally contains four residential dwellings and at least two sanitary sewer home seepage pits. Topography is moderately sloped from north to south in the immediate vicinity of the well. The well site is approximately 30 feet higher in elevation than the lowest portions of the service area.

Well #1 is located inside the well house structure. The top of the well casing projects above the ground surface. The well is approximately 30 feet higher in elevation than the lowest portions of the service area.



MUNICIPAL POU





MUNICIPAL POU





MUNICIPAL POU





MUNICIPAL POU