

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 96-9674

Exam Date: 06/22/2023

1. Current Owner:

ROGER D GRIFFIN 1881 FISH CREEK RD COCOLALLA ID 83813-9750 AND/OR
AVICE MARIE GRIFFIN 1881 FISH CREEK RD COCOLALLA ID 83813-9750

2. Accompanied by: Avice Marie Griffin

Phone No: 949-929-2643

Address: Same as above

Relationship to permit Holder: Permit Holder

3. **SOURCE:**

GROUND WATER

Method of Determination: ArcMap and DRG

B. OVERLAP REVIEW

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

NO Overlap

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

NO Overlap**C. DIVERSION AND DELIVERY SYSTEM**1. **LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER SW¼ SE¼, Sec. 14, Twp 55N, Rge 03W, B.M. BONNER County

Method of Determination: GPS. POD is a groundwater well D0076054 located at -116°39.6821, 48°6.4610.

PLACE OF USE: IRRIGATION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
55N	03W	14															0.1		0.1

Total Acres: 0.1

PLACE OF USE: DOMESTIC

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
55N	03W	14															X		

Method of Determination: Beneficial use field examination & ArcMap aerial imagery.

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components.

X

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.

XX Aerial Photo Attached (required for irrigation of 10+ acres).X

Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No.
D0076054	GRUNDFOS	N/A	MODEL NO. 3SQF-2	GRUNDFOS SQFLEX	PRODUCT NO. 96078027

D. FLOW MEASUREMENTS

1.

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

2. Measurements: Unable to perform flow measurements due to inadequate pipe size requirements. Main water line from pump is buried filling direct to two buried storage reservoirs before distribution to home use.

E. FLOW CALCULATIONS

X Additional Pump Specification Sheets Attached

Measured Method: Theoretical rate derived from manufacturer's pump specifications. The Grundfos 3 SQ-2 solar pump has capacity of 2.8 – 3.0 gpm, or **0.01 cfs** considering department rounding standards.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation:

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 0.1 \text{ ac} \times 3.0 \text{ afa} = 0.3 \text{ af}$$

$$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.01 \text{ cfs} \times 214 \text{ days} \times 1.9835 = 4.2$$

$$V = \text{Smaller of } V_{IR} \text{ and } V_{DR} = \mathbf{0.3 \text{ af}}$$

2. Volume Calculations for Other Uses: Maximum diversion volume = **0.6 af** (domestic in-home use) + 0.3 af (irrigation) = **0.9 af**.

G. NARRATIVE/REMARKS/COMMENTS

The beneficial use field examination was conducted on 6/22/2023 with the applicant, Dr. Avice Marie Griffin, which showed groundwater well D0076054 being used for domestic and irrigation uses. Several elements of the permit were not developed by the applicant as follows:

- Only one well was constructed and service connected on the property; I removed the second groundwater POD from the permit during licensing review.
- The stockwater beneficial use was not developed during the Permit's development period; Stockwater was removed from the permit.
- 1 home was constructed and service-connected vice the 6 homes permit approved to develop.
- Minor irrigation acreage was developed vice the 5.0 acres permit approved to develop.

During the exam I took photographs of the applicant's well and buried storage reservoirs but was unable to determine well pump information at time of exam. The applicant's diverting works ties into an off grid living theme, where a solar pump was installed that doesn't use conventional pump motor relay panels with specification data readily available. I corresponded with the applicant's home contractor, Dennis Ployhar – Mountain Haven Custom Homes, who provided pump specs as installed.

The well pump is a Grundfos SQFlex submersible pump that is solar/generator operated. Mr. Ployhar provided manufacturer data illustrating a Model 3 SQF-2 pump was installed, which has a 2.8 gpm flow capacity. I further researched the SQFlex model pumps from the Grundfos manufacturer website and obtained additional data supporting a 3-gpm flow capacity from the 3-inch helical rotor pump installed in the well. The well driller report for D0076054 supports this flow rate showing that at time of well construction the well test yielded 5 gpm. Based on this information I'm recommending a diversion rate for each beneficial use of 0.01 cfs and a maximum diversion rate for licensing equal to **0.01 cfs**. The applicant's diversion rate(s) are limited by well production & pump discharge rates as installed at time of exam.

During the exam the irrigation and domestic POU was walked with the applicant and photographs were taken illustrating the extent of water usage on the property. A single home was constructed which receives water from two 1,000-gallon storage reservoirs using a booster pump. The applicant has a fire hose adapter installed for use in the event of a fire, but fire protection was not a designated beneficial use on the permit. The applicant understands water use to fight an active fire does not require a recorded water right be in place prior to use. The annual volume recommended for licensing domestic use equals **0.6 af**, with irrigation volume being applied to the separate beneficial use on the permit.

The irrigation POU was sketched out on field maps and consists of 0.1 acres of lawn and landscape plant watering around the residence. ArcMap aerial imagery was used to accurately trace out the POU during licensing review and the annual volume associated with irrigation equals **0.3 af** annually. The maximum diversion volume for licensing equals the sum of two beneficial annual volume rates equaling **0.9 af**. Conditions 26A, 046, and X02 were removed from the Permit during licensing review. Condition 132 was revised to reflect 1 home's domestic use. Condition R66 was replaced with X31 to better describe small acreage irrigation of less than 1 acre. All other conditions on the permit were carried forward to licensing. There are no overlapping water right concerns for this permit toward licensing.

Have conditions of permit approval been met? X 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>
IRRIGATION	04/01 to 10/31	0.01 CFS	0.3 AF
DOMESTIC	01/01 to 12/31	0.01 CFS	0.6 AF

Totals: 0.01 CFS 0.9 AF

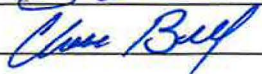
2. Recommended Amendments

 Change P.D. as reflected above Add P.D. as reflected above X None

 Change P.U. as reflected above Add P.U. as reflected above X None

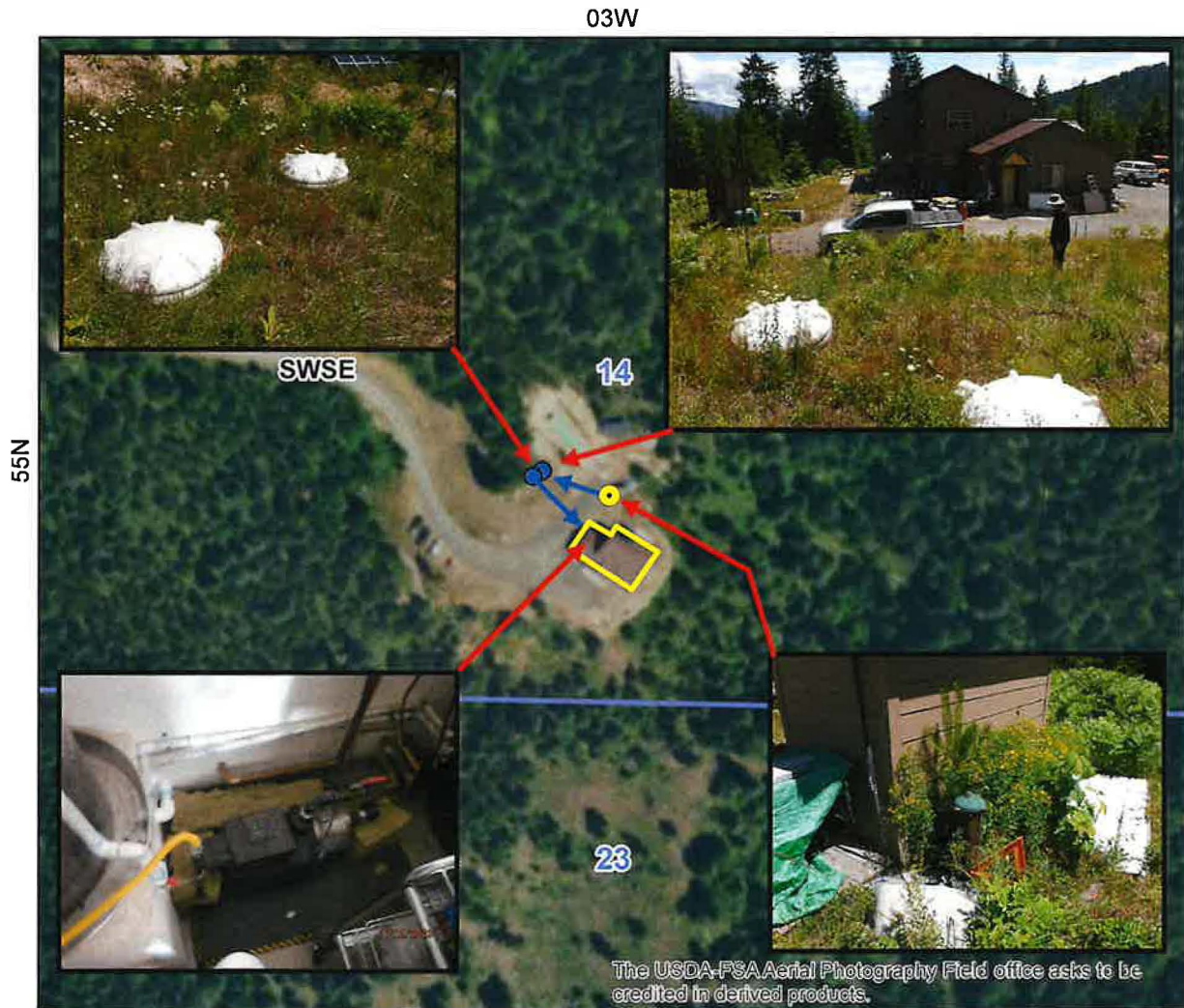
I. AUTHENTICATION Luke Bates -

Field Examiner's Name  Date 11/7/2023

Reviewer  Date 5/22/24

State of Idaho
Department of Water Resources
Attachment to Field Exam
96-9674

DOMESTIC system diagram.



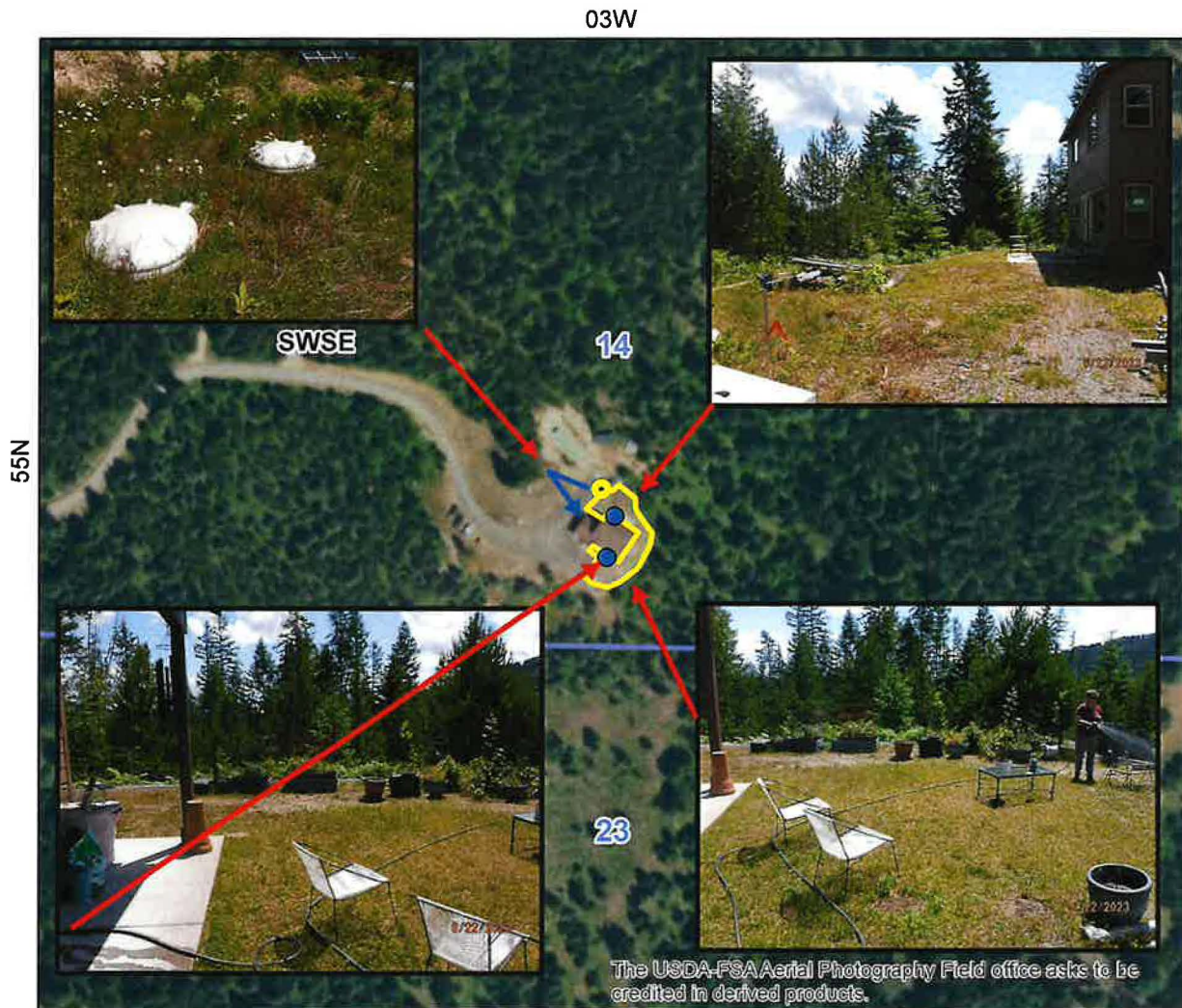
0 0.02 0.04 0.08 Miles

-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters
-  Point of Diversion



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IRRIGATION system diagram.



0 0.025 0.05 0.1 Miles

-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters
-  Point of Diversion



96-9674

AERIAL IMAGERY FOR LICENSING REVIEW

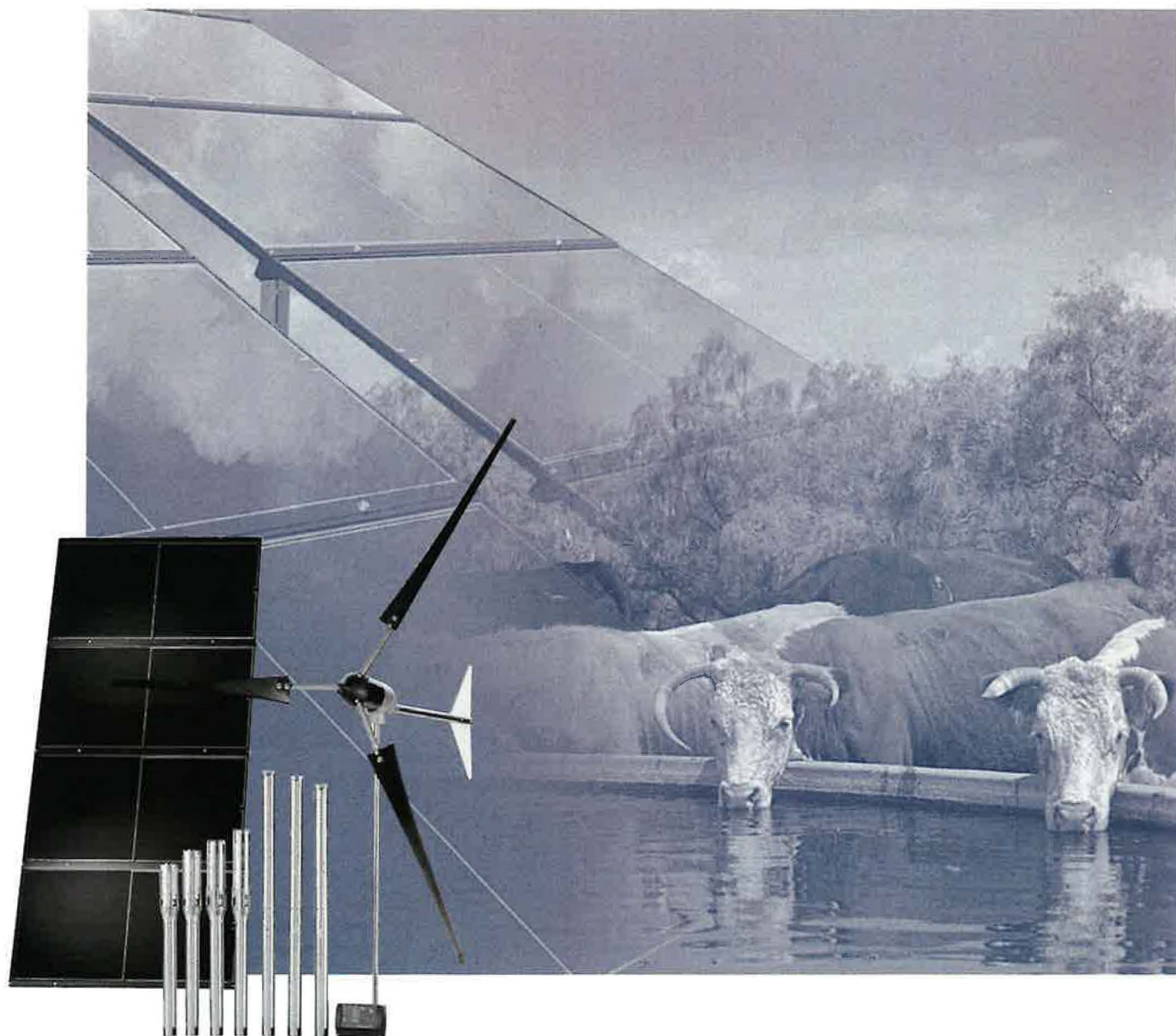


PARCEL RP55N03W148850A

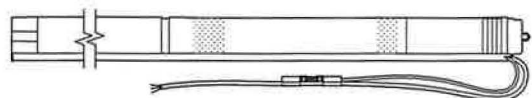
RETRIEVED FROM BONNER COUNTY GIS TAX PARCEL MAP www.cloudgisapps.bonnercountyid.gov

SQFlex

Renewable-energy based water-supply systems
60 Hz



Complete unit with 6 ft cable



TM02 2217 3901

Pump type	Pump size	Product no. SQF
3 SQF-2	3"	96078027
6 SQF-2	3"	96078028
11 SQF-2	3"	96078029
25 SQF-3	4"	96078042
25 SQF-6	4"	96078043
40 SQF-3	4"	96078044
75 SQF-3	4"	96078139

Submersible drop cables

The submersible drop cables for SQF pumps are approved for use in drinking water (KTW approved). The material of the submersible drop cable is EPR.

The table below shows the maximum length of the submersible drop cable for the different sizes of cable, allowing for a 2% power loss.

No. of 50 Wp solar modules	Power [Wp]	Max. cable length [ft]			
		14 AWG	12 AWG	10 AWG	8 AWG
3	150	515	815	1300	2070
4	200	385	610	975	1550
6	300	255	405	650	1035
8	400	190	305	485	775
10	500	155	245	390	620
12	600	125	200	325	515
14	700	110	175	275	440
16	800	95	150	240	385
18	900	85	135	215	345
20	1000	75	120	195	310

The values in the table are based on Grundfos 50 W solar modules (140 VDC output).

The table values are calculated on the basis of the formula:

$$L = \frac{\Delta P \times q \times V_{mp}^2}{Wp \times 100 \times 2 \times \rho} [\text{ft}]$$

where

L = Length of cable [ft]

ΔP = Power loss [%]

V_{mp} = Maximum power voltage [V]

Wp = Watt peak [Wp]

ρ = Specific resistance: $8.175 \times 10^{-6} [\Omega \text{ in}^2/\text{ft}]$

q = Cross-section of submersible drop cable [in^2]

The sizing tool in WinCAPS makes it possible to calculate the exact losses.

IO 100 switch box

The IO 100 is an on/off switch box designed as a positive disconnect for the system voltage supply.

IO 101 switch box

The IO 101 is an on/off switch box designed as a positive disconnect for the system voltage supply.

The IO 101 is used with SQFlex systems supplied by solar panels and with a generator supply backup.

IO 102 breaker box

The IO 102 is an on/off switch box designed as a positive disconnect for the system voltage supply.

The IO 102 is used with wind-powered SQFlex systems or with SQFlex systems powered by wind and solar energy.

IO 102 acts as a brake which makes it possible to slow down or stop the wind turbine.

CU 200 control unit

The CU 200 control unit is a combined status and control unit for the SQFlex pump system. Furthermore, the CU 200 enables connection of a level switch placed in a water reservoir or similar tank.

Solar modules

Grundfos' solar modules have been developed especially for the SQFlex system. The solar modules are equipped with plugs and sockets enabling easy and simple installation.

Grundfos offers data sheets for available solar modules. For further information please contact your local Grundfos Company.

Generator

If the electricity supply from its primary source of energy is temporarily insufficient, the SQFlex system can be supplied by a generator. The generator can either be diesel or gasoline driven.

Batteries

The SQFlex system can be supplied by batteries with a voltage supply of 30 - 300 VDC, minimum current 7A.

Type keys

3 gpm ★
SQF -2

Type key for helical rotor pumps

Example	6	SQF	-2	x
Rated flow at 3000 rpm [US GPM]				
Type range				
Number of stages				
Blank = Stainless steel AISI 304				

Type key for centrifugal pumps

Example	25	SQF	-3	x
Rated flow at 3000 rpm [US GPM] and pump generation				
Type range				
Number of stages				
Blank = Stainless steel AISI 304				

Pumped liquids

The SQF pumps are designed for pumping thin, clean, non-aggressive, non-explosive liquids, not containing solid or long-fibred particles larger than sand grains.

Sand content: max. 50 ppm.

A higher sand content will reduce the pump life considerably due to wear.

pH: 5 - 9

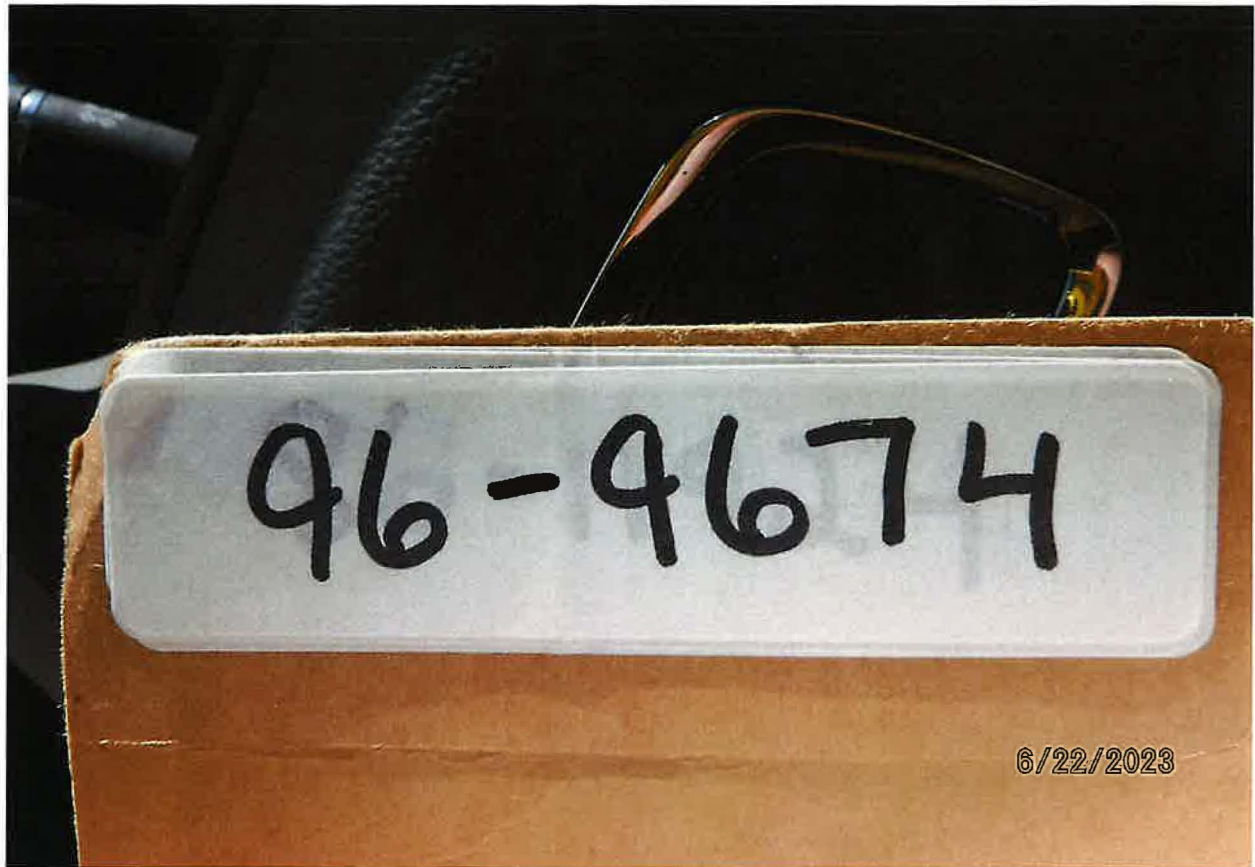
Liquid temperature: 32°F to +104°F

The pump can run at free convection (~ 0 ft/sec) at max. +104°F.

Salt content

The table below shows the resistance of stainless steel to Cl⁻. The figures in the table are based on a pumped liquid with a pH-value of 4 - 9.

Stainless steel		Cl ⁻ content [ppm]	Liquid temperature [°F]
EN/DIN	AISI		
1.4301	304	0 - 300	< 104
		300 - 500	< 86



BENEFICIAL USE FIELD EXAMINATION DATE 6/22/2023



POD – GROUDNWATER WELL D0076054



WELL D-TAG D0076054



2EA STORAGE RESERVOIRS DEVELOPED IN DOMESTIC SYSTEM



DOMESTIC POU – 1 HOME



IRRIGATION POU – LAWN SPACE AROUND HOME BY FROST-FREE HYDRANT AND HOSE TO SPRINKLERS



IRRIGATION POU – LAWN SPACE AROUND HOME BY HOSE BIB AND HOSE TO SPRINKLERS

