

MEMORANDUM

TO: Water Right File 29-7917

FROM: Daniel Nelson – Analyst 3

DATE: July 20, 2022

SUBJECT: Licensing Review of Water Right 29-7917

The field exam for this right was performed by Certified Water Right Examiner Patrick Naylor of Rocky Mountain Environmental Associates, Inc. Mr. Naylor recommended that water right permit 29-7917 (“Permit”) be reinstated and licensed for 0.11 cubic feet per second (cfs) and 21.6 acre-feet (af) for irrigation, 0.11 cfs and 3.0 af for domestic use, and 0.02 cfs and 13,000 gallons per day for stockwater from ground water for a subdivision with 5.4 acres of irrigation, 5 homes, and up to 4 horses.

History and Reinstatement of Permit:

On April 6, 1990, the Idaho Department of Water Resources (“Department”) received an application for permit from Tirrell Water Users, Inc. (“Permit Holder”). This Permit was subsequently approved on July 31, 1990, with a condition that requiring Poof of construction works and application of water to beneficial use was due on August 1, 1992.

On August 1, 1992, the Permit lapsed, and a Lapse Notice was sent on August 5, 1992. The Permit has been lapsed approximately 30 years.

On November 17, 2021, the Department contacted Denny and Denise Brower about irrigating lands without a water right. It was discovered during the investigation of this contact that the water system was owned by Tirrell Water Users. A letter was sent to Tirrell Water Users on December 8, 2021, concerning the water use on approximately 4 acres of ground without a valid water right. It was discovered during this process that Tirrell Water Users were unaware that this Permit had lapsed and the Tirrell Water Users were operating the water system without a valid water right.

On May 11, 2022, the Department received a Statement of Completion for Submitting Beneficial Use (“Proof”), but this Proof was sent without the required Beneficial Use Report, Request to Reinstatement a Permit Lapsed for more than Sixty Days form. The fee of \$250.00 did accompany the Proof.

On May 23, 2022, the Department received the Request to Reinstate a Permit Lapsed for more than Sixty Days form.

On May 27, 2022, the Department received the field report submitted by Mr. Naylor. The field report included a copy of the Proof. The Department had already received the remaining information, so the field report completed the actual filing of Proof according to Idaho Code § 42-218(3). The field examiner found that approximately 5.4 acres were developed, 5 homes were built, and did not mention the number of horses or addressed the stockwater portion.

However, per photos I found on Google Maps, I was able to confirm that there are at least 3 horses on the property associated with the Bower property at 1809 Government Road. Based on the aerial imagery, a large portion of this parcel has been a pasture for horses since the permit was approved. The permit has a condition stating that the stockwater was for 4 horses, and it appears as though that has been accomplished. I contacted Mr. Naylor to confirm the number of livestock in an email on July 21, 2022. Mr. Naylor confirmed in a July 22, 2022, email that the rate and volume for 0 to 10 animals on these properties seems reasonable.

Based on the aerial imagery there is clear evidence that some irrigation occurred in 1992 and there were 5 homes constructed. Due to the black and white imagery, it is difficult to determine the exact number of acres irrigated. Using the available aerial images, it appears as though anywhere to 2 to 6 acres has been irrigated at this subdivision over the years. Based on the information available, I am convinced that the domestic use, stockwater use, and approximately 5 acres of irrigation use was developed in 1992 and 2 to 6 acres have been irrigated throughout the years.

The biggest issue is that this Permit has been lapsed for the last 30 years in an area that has had a moratorium since 1993 or 29 years. The Snake River Moratorium was signed in 1993, so this is a pre-moratorium Permit. The best defense for this Permit is that it has been used in part or maybe a bit more than was developed in 1992 since the permit was approved. I feel we can overcome that issue where they have been utilizing this permit over the years even though it has been lapsed. I believe we could reinstate this permit based on the historic use of this permit.

The next issue of concern is that this system doesn't have a measurement device installed on it. With the 5.4 acres of irrigation recommended by Mr. Naylor, a measurement device would be required on this permit. Per my conversations with Department staff, a measurement device is required on irrigation of more than 5 acres. Therefore, conditions regarding the measurement devices and lockable controlling works would need to be added to the license, because Water District 120 was formed after the approval of this permit.

Probably the final issue would be how this right would be addressed in the Surface Water Collation Call and mitigation for use. If this permit is reinstated, it will have a May 27, 2022, priority date. This priority date would require that this Permit be part of a mitigation plan or be curtailed almost every year. I have been informed that once the permit is reinstated, the permit holder will probably ask Aberdeen Springfield Ground Water District for mitigation.

I am concerned about reinstating a permit that has been lapsed for over 30 years, even though, the water has been used since Proof was due. A great deal has happened over the years on the Eastern Snake Plain Aquifer (ESPA), and this water use hasn't been a party to those issues. Idaho Code §42-218a(3) doesn't provide any limitations for the amount of time a permit has been lapsed. With the information supplied by the Permit Holder, there is nothing that would prevent the reinstatement of this Permit.

However, an amendment is needed to correct the legal descriptions for the point of diversion and place of use. The legal descriptions for the point of diversion and place of use did not include the Government Lot designation.

Overlap:

There are no overlapping water rights for this place of use.

Point of Diversion and Place of Use:

In an email dated July 20, 2022, Mr. Naylor provided maps that showed the location of the well. The irrigation, domestic, and stockwater places of use appear reasonable. I was able to recreate the irrigation place of use of 5.4 acres. The place of use for the irrigation use was difficult to determine using the black and white imagery. However, I was able to create what I believe is a fair representation of what was irrigated in 1992 based on a variety of aerial imagery of the area after the proof of beneficial use was due. I am recommending that the 5.4 acres of irrigation recommended by Mr. Naylor is reasonable.

The legal description for the point of diversion and place of use did not include the government lot. This will need to be addressed with an amendment of permit.

Diversion Rate and Volume:

Administrative Processing Memorandum #22 limits the diversion rate of 5 domestic homes for in-house use to 0.11 cfs. Mr. Naylor recommended that diversion rate of the domestic use. Mr. Naylor also recommended 0.6 af per home, which is consistent with Administrative Processing Memorandum #22, so I feel the recommendations for the domestic use and volumes are reasonable.

Mr. Naylor originally recommended a diversion rate of 0.02 cfs and volume of 13,000 gallons per day for the stockwater use. I contacted Mr. Naylor on July 21, 2022, concerning this issue. On July 22, 2022, Mr. Naylor contacted me by email, and confirmed that a diversion rate of 0.02 cfs and volume of 0.2 af was reasonable for the stockwater use. Mr. Naylor recommended a total diversion rate of 0.17 cfs when these uses are combined. This is based on his analysis of the drawdown in the well.

I reviewed well drilling records and I did find a well for Leon Terrell drilled in 1977. I am not sure if this is the same well or not, but I used it as one of my comparison wells. On this well driller's report, they state that the well has a 28-foot static level with an 18-inch drawdown. Using the standard 50 psi for domestic type systems, this well would produce approximately 95 gpm or 0.21 cfs ($[8.8 \times 0.70 \times 5 \text{ Hp}] / [30 \text{ feet lift} + \{50 \text{ psi} \times 2.31\}] = 0.212 \text{ cfs}$). The second well that I reviewed was for a neighbor across the road to the west at 1384 Syphon Road. This well states that it has a 43-foot static level and a 100-ft pumping water level. Using the information from this well, I came up with a diversion rate of 64 gpm or 0.14 cfs ($[8.8 \times 0.70 \times 5 \text{ Hp}] / [100 \text{ feet lift} + \{50 \text{ psi} \times 2.31\}] = 0.143 \text{ cfs}$). My analysis shows a range of 0.14 cfs to 0.21 cfs. The 0.17 cfs recommended by the field examiner seems reasonable based on the range of diversion rates I would consider a 5Hp pump could produce in this area.

Conditions:

As stated above, conditions for this permit are outdated. I am recommending all the older conditions be removed and current conditions be added to this permit. Conditions 213, R05, R64, WB5, and 004 should be added to this permit for licensing purposes. A modified version of 214 should be used instead of the standard R43 based on location. The only condition similar to those above is the condition 004, but the permit had an older version of this condition.

PLEASE NOTE: I have attached the Google Maps photos of the horses, Imagery used to determine irrigated acres, and the well driller reports used to review the diversion rate.

Stockwater Review for Permit 29-7917. The photo below comes from Google Maps for the property at 1809 Government Road. This photo shows 2 horses in the barn and one of th horses in the corner of the pasture.



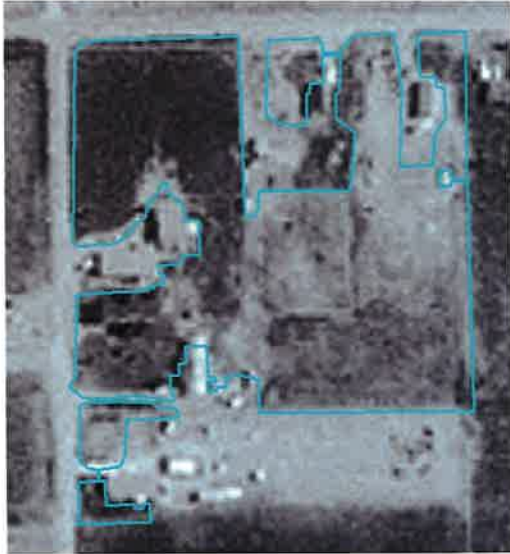
Irrigation Comparison for Permit 29-7917

1992 IDWR NAIP Imagery at full scale.



Irrigation Comparison for Permit 29-7917

1992 IDWR NAIP Imagery



1992 Google Earth Imagery



1993 Google Earth Imagery



2003 Google Earth Imagery



2004 IDWR NAIP Imagery



2006 IDWR NAIP Imagery



2009 Google Earth Imagery



2011 IDWR NAIP Imagery



2013 IDWR NAIP Imagery



2015 IDWR NAIP Imagery



2016 IDWR ESRI Imagery



2017 IDWR NAIP Imagery



2019 IDWR NAIP Imagery



2021 IDWR NAIP Imagery



RECEIVED
USE TYPEWRITER OR
BALLPOINT PEN

OCT 16 1991

Department of Water Resources
Eastern District Office

[illegible]

USE TYPEWRITER OR
BALL POINT PEN

State of Idaho
Department of Water Resources

Location Corrected by IDWR To:

WELL DRILLER'S REPORT

T06S R33E Sec. 2 SWSNW

State law requires that this report be filed with the Director, Department of Water Resources, within 30 days after the completion or abandonment of the well.

By: mciscell 2012-12-14

1. WELL OWNER

Name LEON TERRELL
Address Box 2631 Syron Ro.
Pocatello, Idaho
Owner's Permit No. _____

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning)

3. PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Test ☐ Other (specify type)
☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection

4. METHOD DRILLED

☐ Cable ☒ Rotary ☐ Dug ☐ Other

5. WELL CONSTRUCTION

Diameter of hole 8" inches Total depth 150' feet
Casing schedule: ☒ Steel ☐ Concrete
Thickness 350 inches 8" inches 15 feet 150 feet
_____ inches _____ inches _____ feet _____ feet
_____ inches _____ inches _____ feet _____ feet
_____ inches _____ inches _____ feet _____ feet
_____ inches _____ inches _____ feet _____ feet
Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation _____ inches by _____ inches
Number _____ From _____ To _____
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name _____
Type _____ Model No. _____
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Gravel packed? ☐ Yes ☒ No Size of gravel _____
Placed from _____ feet to _____ feet
Surface seal depth 18' Material used in seal ☐ Cement grout
☐ Pudding clay ☒ Well cuttings
Sealing procedure used ☐ Slurry pit ☒ Temporary surface casing
☐ Overbore to seal depth

6. LOCATION OF WELL

Location map location must agree with written location.



Subdivision Name _____
Lot No. _____ Block No. _____

County Bennett

SW 1/4 NW 2 Sec. 2 T. 6 S. R. 33 E. 20

7. WATER LEVEL

Department of Water Resources

Eastern District Office

Static water level 38' feet below land surface
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Temperature 51 ° F. Quality GOOD
Artesian closed-in pressure _____ p.s.i.
Controlled by ☐ Valve ☐ Cap ☐ Plug

8. WELL TEST DATA

☐ Pump ☐ Bailer ☐ Other

Discharge G.P.M.	Draw Down	Hours Pumped
<u>100</u>	<u>18"</u>	<u>1 HR.</u>

9. LITHOLOGIC LOG

86742

Hole Diam.	Depth		Material	Water
	From	To		Yes No
8"	0	3'	TIP SOIL	☒
8"	3	25'	GRAVEL + BUILDERS	
	25	38'	SAND + GRAVEL	
	38	66'	BLUE CLAY	
	66	78'	GRAVEL	
	78	103'	SAND	
	103	112'	BROWN CLAY	
	112	140'	COARSE SAND + SOME GRN.	
	140	150'	GRAVEL + SOME CLAY	
			</	

10.

Work started 3/1/77 finished 3/2/77

11. DRILLERS CERTIFICATION

Firm Name Jack P. Smith Drilling Firm No. 97
Address 465 So. Broadway Date 6-15-77
Signed by (Firm Official) Jack P. Smith
and Jack P. Smith
(Operator)

USE ADDITIONAL SHEETS IF NECESSARY

FORWARD THE WHITE COPY TO THE DEPARTMENT

Nelson, Dan

From: Nelson, Dan
Sent: Friday, July 22, 2022 2:48 PM
To: Patrick Naylor
Subject: RE: Revised Figure 3, BUFR for WR Permit 29-07917, Tyrell Water Users Inc.

Sounds great Patrick.

Dan Nelson

From: Patrick Naylor <patrick.rmea@gmail.com>
Sent: Friday, July 22, 2022 2:36 PM
To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>
Cc: Kristin M. Moore <kristin.rmea@gmail.com>
Subject: Re: Revised Figure 3, BUFR for WR Permit 29-07917, Tyrell Water Users Inc.

Dan, I consulted with Kristin Moore in our office. We agree that your proposed stockwater allowances seem reasonable.

Thanks
Pat

Patrick N. Naylor; PE, PG., CWRE
Vice-President, Principal Hydrogeologist
482 Constitution Way, Suite 303, Idaho Falls, ID 83402
E-Mail: patrick.rmea@gmail.com
VOICE: 208-524-2353 ||| Cell: 208-323-4444



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On Thu, Jul 21, 2022 at 7:13 AM Nelson, Dan <Dan.Nelson@idwr.idaho.gov> wrote:

Hello Patrick,

The only other thing that I saw was that you placed a volume of 13,000 gallons per day on the stockwater use and didn't provide the number of livestock. The 13,000 gallon per day designation is for an entire water right the falls under the de minimis category described in Idaho Code §42-111. You can't separate out one component of a water right for this designation.

Since you didn't supply any animal numbers, I looked at the permit and application for permit and found they requested livestock water for 4 horses. I was able to see 3 horses on the Brower property in Google Maps Street View. I plan to use Administrative Processing Memorandum #3 for the diversion rate and volume for the stockwater portion of this permit. Administrative Processing Memorandum #3 states that from 0 to 10 head of range cattle the rate and volume should be 0.02 cfs and 0.2 af. In section 1 of the memo below the table, it states that the Horses and Range Cattle use the same amount of water or 12 gallons per day.

If you don't have any objections, I am going to recommend 0.02 cfs and 0.2 af for the stockwater portion of this permit. If you don't agree please provide a recommendation that is accompanied by the actual livestock numbers and how you calculated the diversion rate and/or volume.

Thank you again for you help on this one.

Daniel Nelson

Water Right Analyst 3

Idaho Department of Water Resources

Telephone (208) 287-4856

Fax (208) 287-6700 (attn: Dan Nelson)

From: Patrick Naylor <patrick.rmea@gmail.com>

Sent: Wednesday, July 20, 2022 4:51 PM

To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>

Cc: Kristin M. Moore <kristin.rmea@gmail.com>

Subject: Re: Revised Figure 3, BUFR for WR Permit 29-07917, Tyrell Water Users Inc.

Hi Dan,

April 7, 1975

OPERATIONS DIVISION
ADMINISTRATOR'S MEMORANDUM

This Administrative Memorandum is not new law but is an agency interpretation of existing law. For more information or to provide input on the memorandum, please contact Rosemary DeMond at 268-287-4800. (Feb. 2020)

TO: District Office
FROM: A. Kenneth Dunn
SUBJECT: Annual Use of Water For Stockwater Purposes

No. of Stock (head)	RANGE CATTLE		DAIRY CATTLE	
	Rate* c.f.s. (1)	Volume AF/yr. (1)	Rate* c.f.s. (2)	Volume AF/yr. (2)
0 - 10	0.02	0.2	0.02	0.4
11 - 25	0.02	0.4	0.02	1.0
26 - 50	0.02	0.7	0.04	2.0
51 - 100	0.03	1.4	0.07	4.0
101 - 200	0.05	2.7	0.13	7.9
201 - 300	0.07	4.1	0.20	12.0
301 - 400	0.09	5.4	0.26	16.0
401 - 500	0.12	6.7	0.33	20.0
501 - 600	0.14	8.1	0.39	24.0
601 - 700	0.16	9.4	0.46	28.0
701 - 800	0.19	11.0	0.52	32.0
801 - 900	0.20	12.0	0.58	36.0
901 - 1000	0.23	14.0	0.65	40.0
1001 - up (3				

(1) The amounts shown are based on 12 gpd/head with a 12 month period of use. (i.e. for range cattle, horses and mules). The amount does not include a loss (i.e. thru conveyance, etc.)

2. The amounts shown are based on 35 gpd/head with a 12 month period of use. (i.e. for dairy cattle). The amount does not include a loss. (i.e. thru conveyance, etc.).

3. For annual use calculations which involve more than 1000 head, round the number of head up to the next even one hundred, and

Volume

- a) for livestock use @ 12 gpd/hd, N (0.0134).
- b) for dairy use @ 35 gpd/hd, N (0.0391).

Rate

- a) for livestock use @ 12 gpd/hd, N (0.00022).
- b) for dairy use @ 35 gpd/hd, N (0.00065).

The answer should be rounded up to the nearest whole acre-foot.

*The rate is based upon approx. 2 hr/day diversion to obtain daily requirement.

A. Kenneth Dunn

Attached is the "formal" revised Figure 3 showing the well location at the Turren Water Users site. Let me know if you need anything else.

Regards

Pat

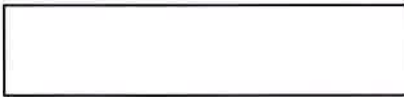
Patrick N. Naylor; PE, PG., CWRE

Vice-President, Principal Hydrogeologist

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E-Mail: patrick.rmea@gmail.com

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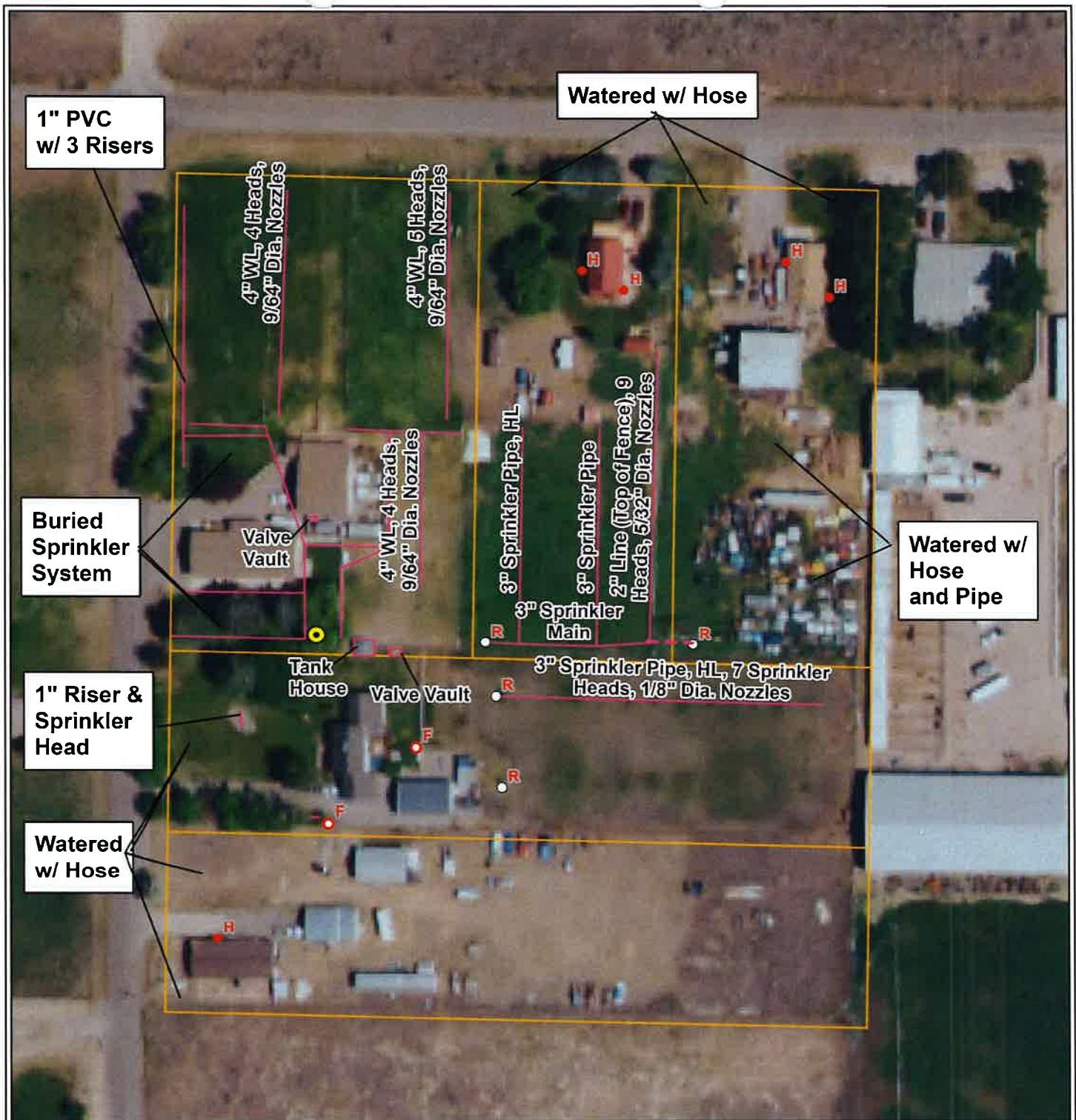


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On Wed, Jul 20, 2022 at 1:20 PM Nelson, Dan <Dan.Nelson@idwr.idaho.gov> wrote:

Patrick,

It isn't a problem. This will work fine. I am planning on preparing a final review memo and order to my supervisor by the end of this week. We are still working on drought related issues, so I can't guarantee that a decision will be formalized anytime soon. My supervisor plans to speak with the Eastern Region manager in



0 0.01 0.03 0.05 Miles

2021 NAIP

- Well (8" Dia.)
- F: 1" Faucet
- H: 3/4" House Garden Hose Connection
- R: 3" Riser
- Water Lines
- Parcels



Figure 3: Water Distribution System

Tirrell Water Users, Inc.

Project #: 21-0271

Drawn by: AD

Date: 7/20/2022



Idaho Falls next week about several issues and asked if I could have this review completed by then to allow them to discuss the situation.

Thank you very much for the quick response and please don't hesitate to contact me if you have any questions.

Respectfully,

Daniel Nelson

Water Right Analyst 3

Idaho Department of Water Resources

Telephone (208) 287-4856

Fax (208) 287-6700 (attn: Dan Nelson)

From: Patrick Naylor <patrick.rmea@gmail.com>

Sent: Wednesday, July 20, 2022 12:24 PM

To: Nelson, Dan <Dan.Nelson@idwr.idaho.gov>

Cc: Kristin M. Moore <kristin.rmea@gmail.com>

Subject: Revised Figure 3, BUFR for WR Permit 29-07917, Tyrell Water Users Inc.

Hi Dan,

My apologies for missing this on Figure 3 of the Beneficial Use Field Report for the above-referenced water right permit. In the interest of time I am sending a hand-edited revision of Figure 3, showing the location of the well (on the south end of the Brower property, a little WNW of the Tank House). I will ask our figure drafter to make the formal correction when she is available, I will send the revised figure when that is done. It may take a day or two.

Regards

Pat

Patrick N. Naylor; PE, PG., CWRE

Vice-President, Principal Hydrogeologist

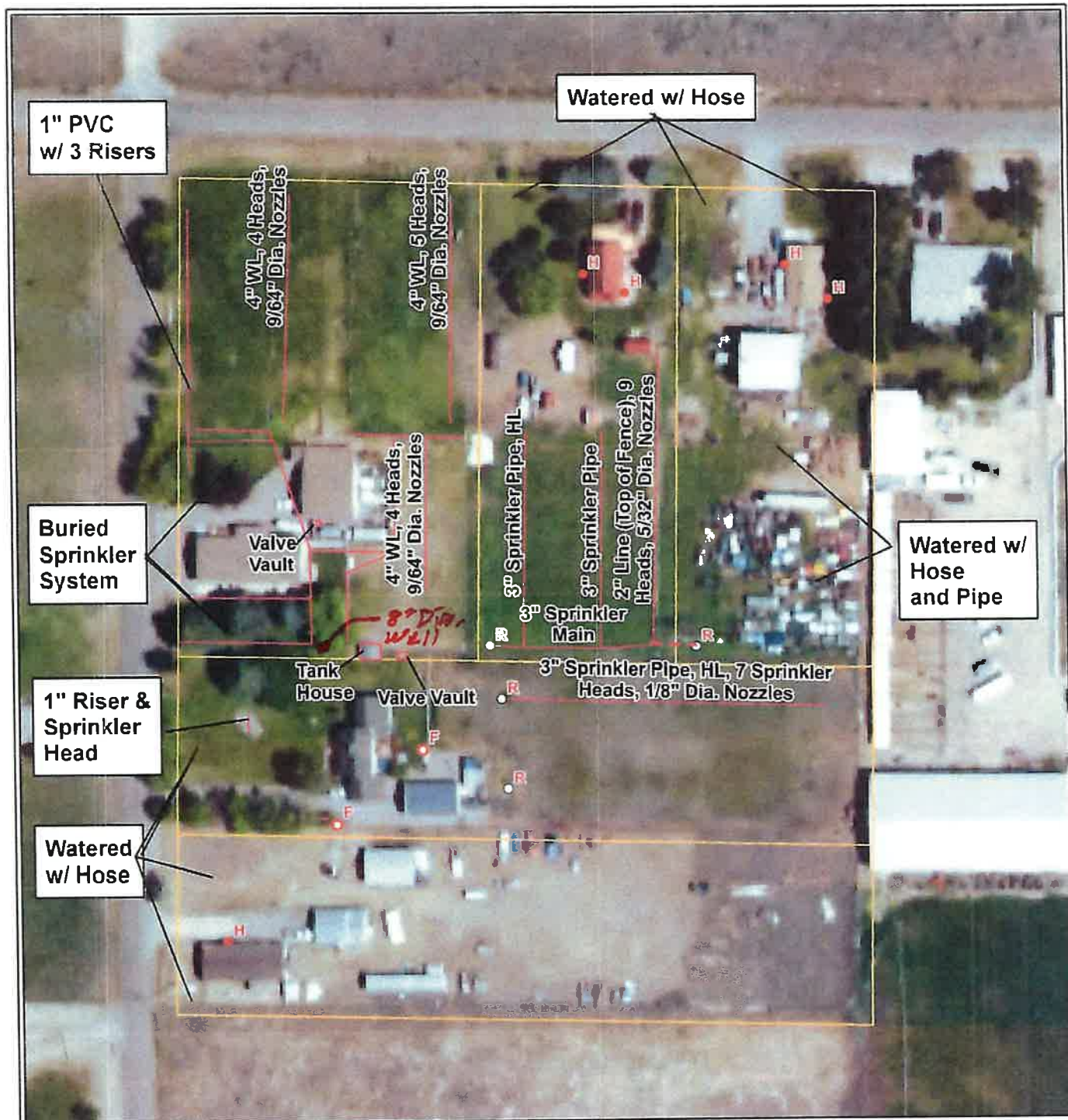
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0 0.01 0.03 0.05 Miles

2021 NAIP

- Water Lines
- ▭ Parcels
- F: 1" Faucet
- H: 3/4" House Garden Hose Connection
- R: 3" Riser

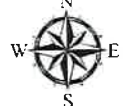


Figure 3: Water Distribution System

Tirrell Water Users, Inc.

Project #: 21-0271
 Drawn by: AD
 Date: 5/3/2022



Rocky Mountain
ENVIRONMENTAL
 ASSOCIATES, INC.

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

RECEIVED**MAY 27 2022****DEPARTMENT OF
WATER RESOURCES**

A Beneficial Use Field Report is prepared by a water right examiner as the result of an examination to clearly confirm and establish the extent of the beneficial use of water established in connection with a permit during the development period authorized by the permit and any extensions of time previously approved.

A. GENERAL INFORMATIONPermit No. 29-079171. Owner TIRRELL WATER USERS INCPhone No. 208-547-7396Current address 1809 GOVERNMENT RD, POCATELLO, ID 832042. Examiner's name Patrick NaylorEXAM DATE April 5, 20223. Accompanied by Merlin KulickeEmail mjkulicke@hotmail.comAddress 1809 Government Rd, Pocatello, Idaho, 83204Relationship to permit holder President of AssociationPhone No. 208-547-73964. Source Groundwater

tributary to _____

B. OVERLAP REVIEW1. Other water rights with the same place of use None2. Other water rights with the same source and point of diversion None**C. DIVERSION AND DELIVERY SYSTEM**

1. Point(s) of Diversion:

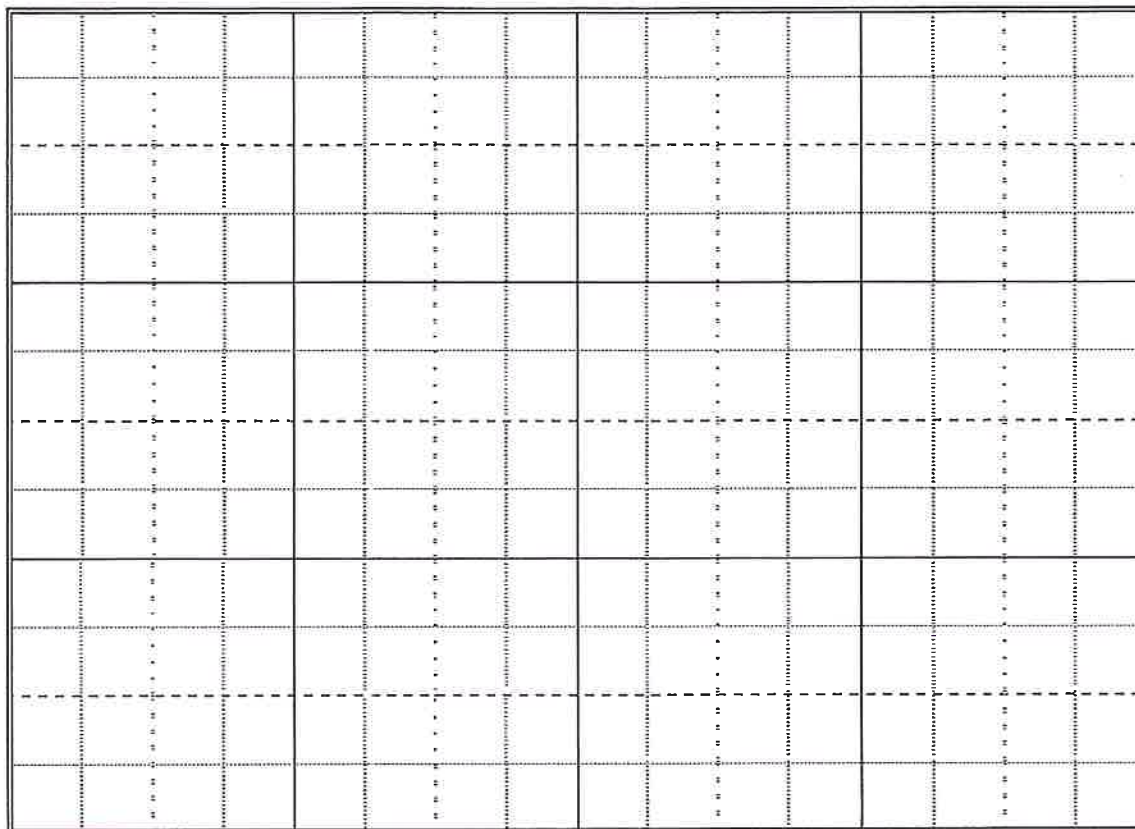
Ident. No.	Gov't Lot	¼	¼	¼	Sec	Twp	Rge	County	Method of Determination/Remarks
			NE	NW	2	6S	33E	Power	IDWR Supplied Shapefiles

2. Place(s) of Use:

Method of determination Field verified current practices; historical aerial photo review

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
6S	33E	2					5.4												5.4
																			5.4

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe diameter (inside), as applicable. Use the space provided or ☒ see attached.



Scale: 1" = _____

- ☒ Copy of USGS Quadrangle attached showing location(s) of point(s) of diversion and place(s) of use (required)
☒ Aerial photo attached (required for irrigation of 10+ acres)
☒ Photo of diversion and system attached

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
Well ID 392645	Grundfos	5.0		Grundfos	2-inch discharge
	MS4000 Series			60S50-9	
See Attachment C for	Pump Curve				

*Code to correspond with no. on map and aerial photo

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
Estimated based on pump curve						
and sprinkler nozzle diameters	Attach. D					

2. **Measurements:** _____

Flow was estimated 1) based on estimated well drawdown, initial static groundwater level from well log, irrigation system pressure observed during operation, and well pump model curve; and 2) based on sprinkler head nozzle diameter capacities for the largest irrigation lines in the system.

E. NARRATIVE/REMARKS/COMMENTS

The Tirrell Water Users Inc. (TWUI) water system consists of one 8-inch diameter well, 150 ft deep and open to the aquifer at the bottom of the well; a cinder block building with five, WellXTrol model Wx-255, 81-gal capacity hydropneumatic tanks. From the well water is pumped directly to the tank building, and from there to the distribution lines shown in the attached Figure 3. Water lines also go directly to each house for domestic use (not shown). Irrigation lines include three 4-inch wheel lines (Brower property), three 3-inch hand lines (two on Farrell property, one on Kulicke property), two 2-inch fence-mounted lines (one on Brower property, one on fence between Farrell and Potter properties), one 1-inch line laying directly on the ground (Brower property), One 1-inch fixed riser (Kulicke house lawn), three 1-inch spigots (Kulicke house), a buried lawn sprinkler system (Brower house lawn), and six house faucets (two on Potter house, two on Farrell house, two on Turinbeauch house). Stock grazing (horses, cattle, goats) occurs on much of the property. Two buried valve boxes control and isolate flow to the buried irrigation mains.

Proof of Beneficial Use for TWUI is unusual because a mix-up resulted in no water right being issued in the original proof year of 1992. No Statement of Completion was submitted at that time, but the TWUI manager at the time left without following through. The other TWUI members were unaware of the requirement for demonstrating beneficial use, therefore no proof was prepared and no water right was issued by IDWR. Meanwhile, the TWUI members continued to use the water under the mistaken belief that their water right had been secured.

The existing water system had no mechanism for direct measurement of flowrate, so the capacity of the well pump was estimated. The total pump system head was estimated by observing the pressure in the system (see Photos) when the highest-capacity irrigation line was in use ($42 \text{ psi} = 97 \text{ ft head}$) + estimated well drawdown (difference between pre-pumping pressure of $55 \text{ psi} = 127 \text{ ft head}$ and pumping pressure = $127 \text{ ft} - 97 \text{ ft} = 30 \text{ ft}$) + estimated depth to static water level (28 feet on well driller report from March 1977). Pressure system was estimated to be $97 \text{ ft} + 30 \text{ ft} + 28 \text{ ft} = 155 \text{ ft}$. (Friction losses were disregarded.) From the attached pump curve for the well pump, the estimated pump capacity is $75 \text{ gpm} = 0.17 \text{ cfs}$. Note, no information was available on the original pump.

Field observation of irrigation pumping occurred on April 5, 2022. Each of the irrigation water systems was observed to pump, with the exception of some of the house faucets used to irrigate domestic lawns by hose. Impact sprinkler head nozzle sizes were checked, and the number of impact sprinkler heads were counted for each line.

Has the permit holder met all conditions of permit approval, including any mitigation requirements and/or measuring device installation requirements? ☐ Yes ☒ No If no, what must be done to meet the permit requirements?

Proof was not submitted by August 1, 1992 as required in the original permit. The reasons for this are explained in the paragraph above. This BUFR was prepared to bring the water users into compliance.

F. FLOW CALCULATIONS☒ Additional computation sheets attached

Measured Method:

See Attachment E, Calculations Sheet. Note that it was not possible to estimate pumping from power demand in 1992 because neither TWUI nor Idaho Power had retained records going back that far. Current power records were available, but served no purpose without the historical pumping records with which to compare to verify the diversion quantities were the same.

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{I,R} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 5.4 \text{ ac} \times 4.0 \text{ ac-ft/ac/yr} = 21.6 \text{ ac-ft/yr}$$

$$V_{D,R} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 = 0.11 \text{ cfs} \times 214 \text{ days} \times 1.9835 = 46.7 \text{ ac-ft/yr}$$

$$V = \text{Smaller of } V_{I,R} \text{ and } V_{D,R} = 21.6 \text{ ac-ft/yr}$$

2. Volume Calculations for Other Uses:

Domestic: 5 homes $\times$ 0.6 afa/home = 3 afa

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use		Rate of Diversion	Annual Volume
	From	To	Q (cfs)	V (afa)
Irrigation	Apr 1	Oct 31	0.11	21.6
Domestic	Jan 1	Dec 31	0.11	3.0
Stockwater	Jan 1	Dec 31	0.02	13,000 gpd
Totals:			0.17	24.6

2. Recommended Amendments

☐ Change P.D. as reflected on page 1☐ Add P.D. as reflected on page 1☐ None☐ Change P.U. as reflected on page 1☐ Add P.U. as reflected on page 1☐ Other**I. AUTHENTICATION**

Field Examiner's Signature



Date May 3, 2022



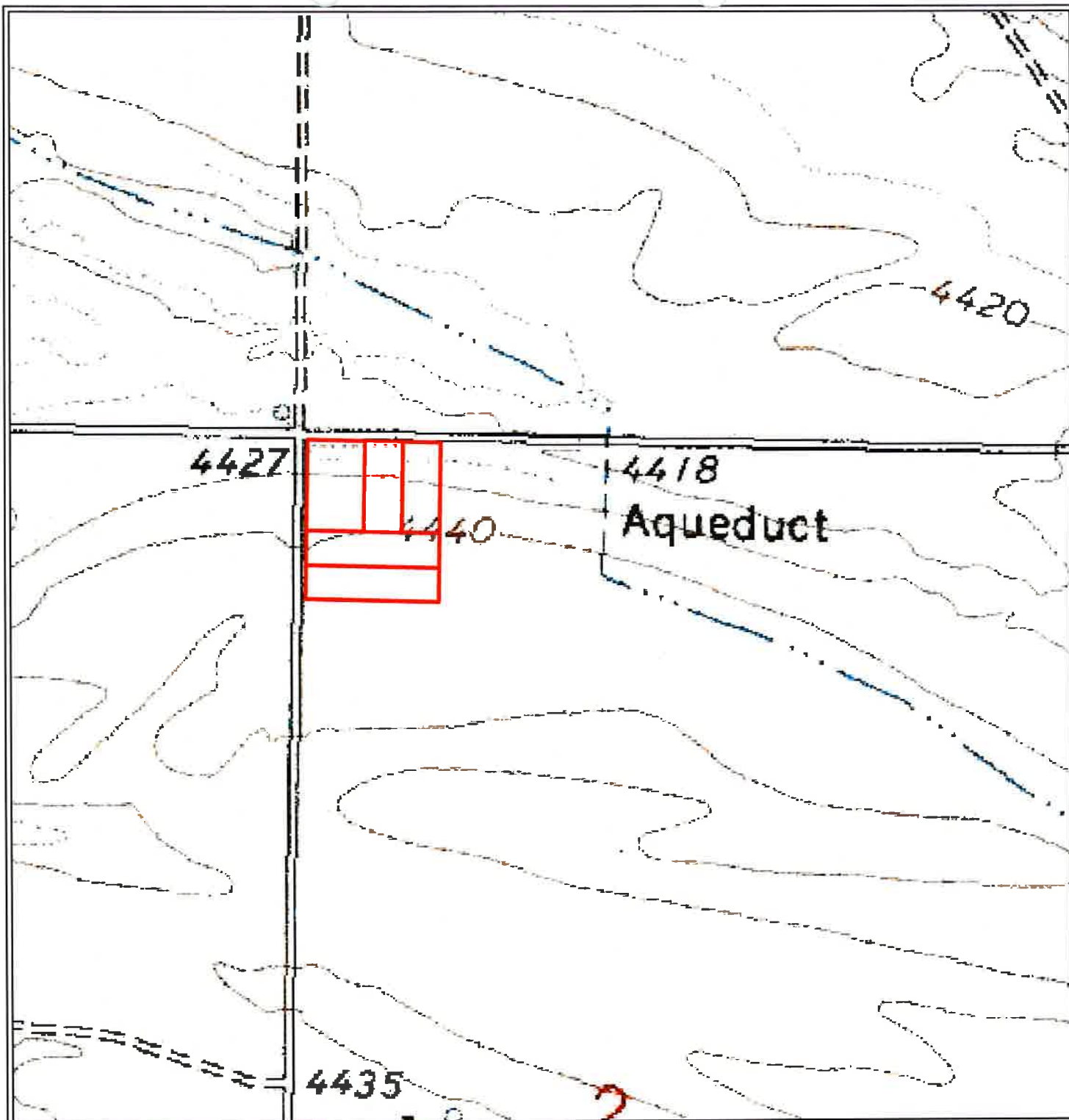
SEAL

Reviewer

Date



**ATTACHMENT A – AERIALS, TOPOGRAPHIC
MAP, SYSTEM LAYOUT**



0 0.07 0.15 0.3 Miles

Contour Interval: 10ft

 Parcels

USGS Topographic Map 1971,
photoinspected 1974, 7.5-minute series,
Michaud, Idaho



Figure 1: Topographic Map

Tirrell Water Users, Inc.

Project #: 21-0271

Drawn by: AD

Date: 5/3/2022



Rocky Mountain
ENVIRONMENTAL
ASSOCIATES, INC.



0 0.02 0.04 0.07 Miles

2021 NAIP

- Parcels
- Twn & Rng
- Section
- QQ



Figure 2: Parcel Ownership

Tirrell Water Users, Inc.

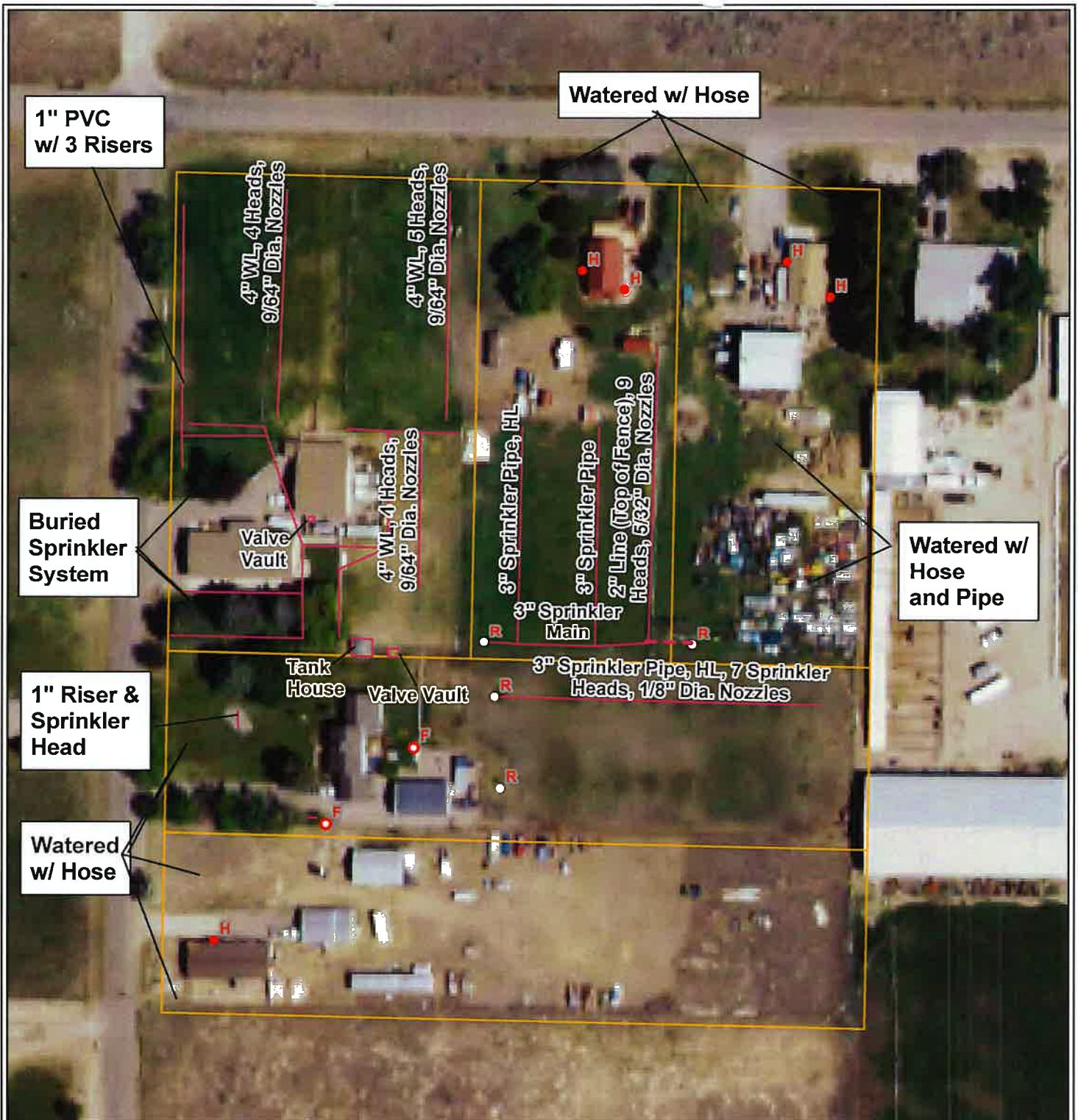
Project #: 21-0271

Drawn by: AD

Date: 5/3/2022



Rocky Mountain
ENVIRONMENTAL
ASSOCIATES, INC.



0 0.01 0.03 0.05 Miles

2021 NAIP

- Water Lines
- ▭ Parcels
- F: 1" Faucet
- H: 3/4" House Garden Hose Connection
- R: 3" Riser



Figure 3: Water Distribution System

Tirrell Water Users, Inc.

Project #: 21-0271

Drawn by: AD

Date: 5/3/2022



Rocky Mountain
ENVIRONMENTAL
ASSOCIATES, INC.



0 0.02 0.04 0.07 Miles

1993 Google Earth Image

- 1993 Irrigated Acres (POU, 5.4 ac)
- Parcels



Figure 4: Historical Aerial 1993

Tirrell Water Users, Inc.

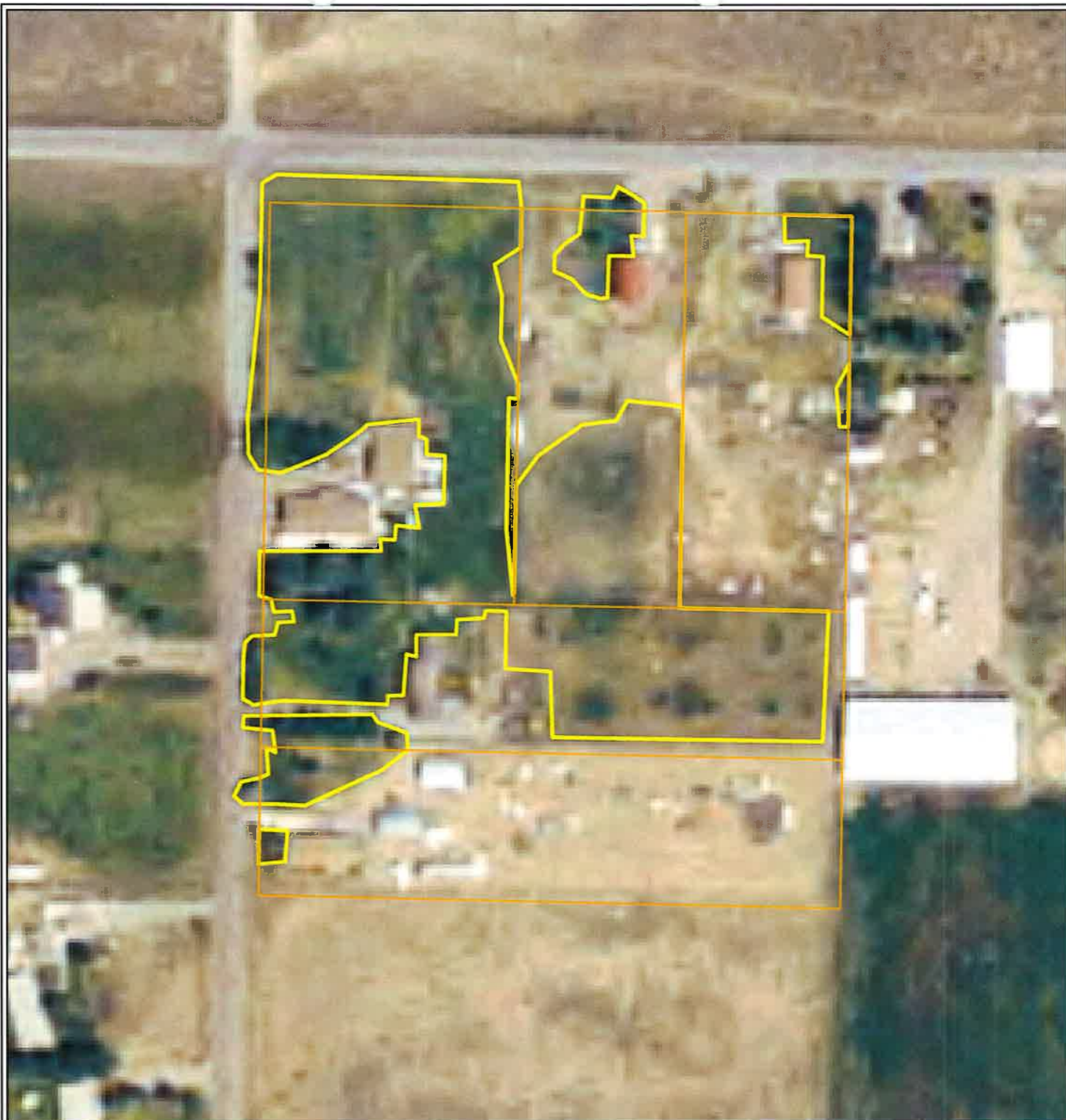
Project #: 21-0271

Drawn by: AD

Date: 5/3/2022



Rocky Mountain
ENVIRONMENTAL
ASSOCIATES, INC.



0 0.02 0.04 0.07 Miles

2004 NAIP

- 2004 Irrigated Acres
- Parcels



Figure 5: Historical Aerial 2004

Tirrell Water Users, Inc.

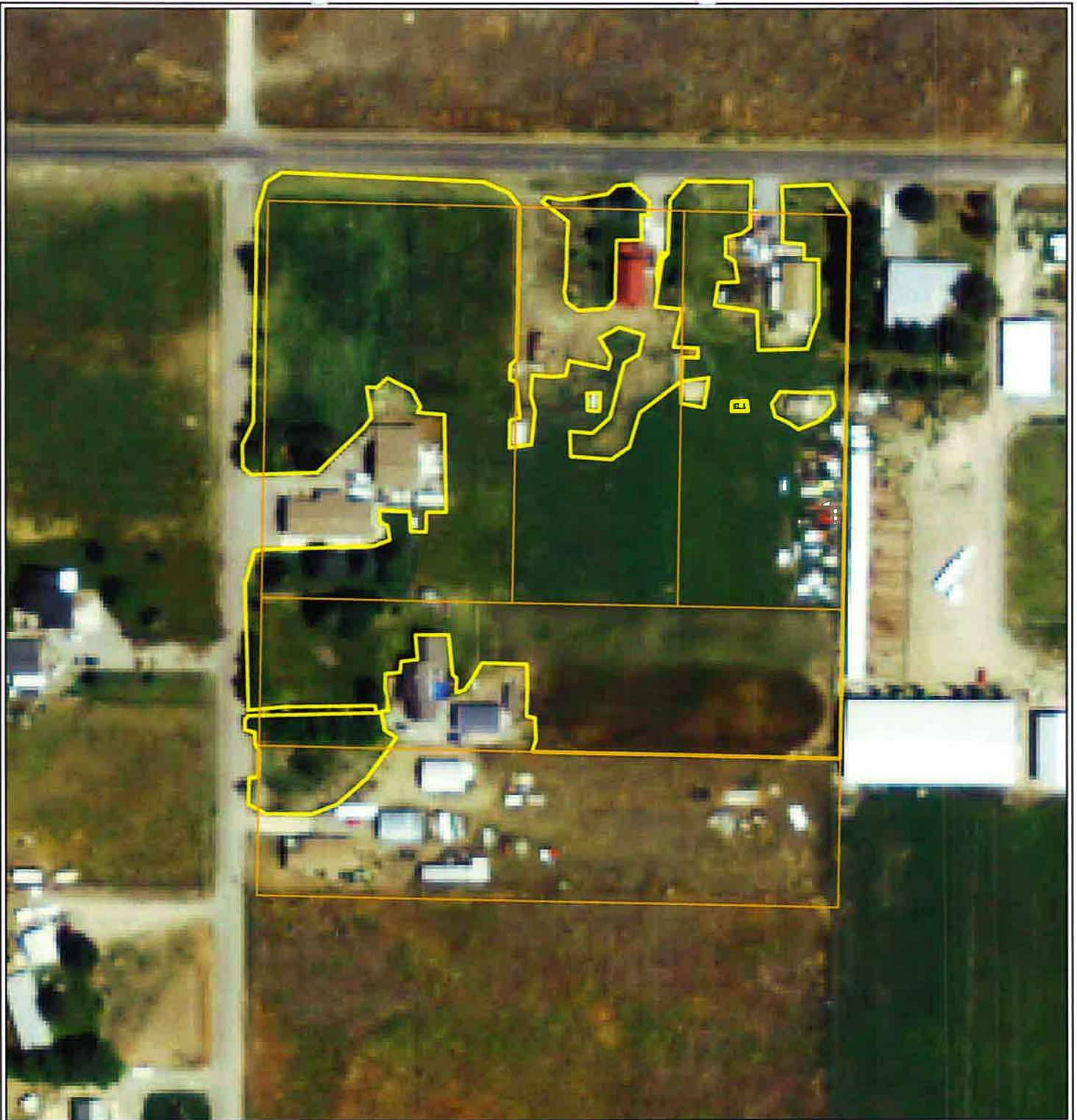
Project #: 21-0271

Drawn by: AD

Date: 5/3/2022



Rocky Mountain
ENVIRONMENTAL
ASSOCIATES, INC.



0 0.02 0.04 0.07 Miles

2011 NAIP

-  2011 Irrigated Acres
-  Parcels



Figure 6: Historical Aerial 2011

Tirrell Water Users, Inc.

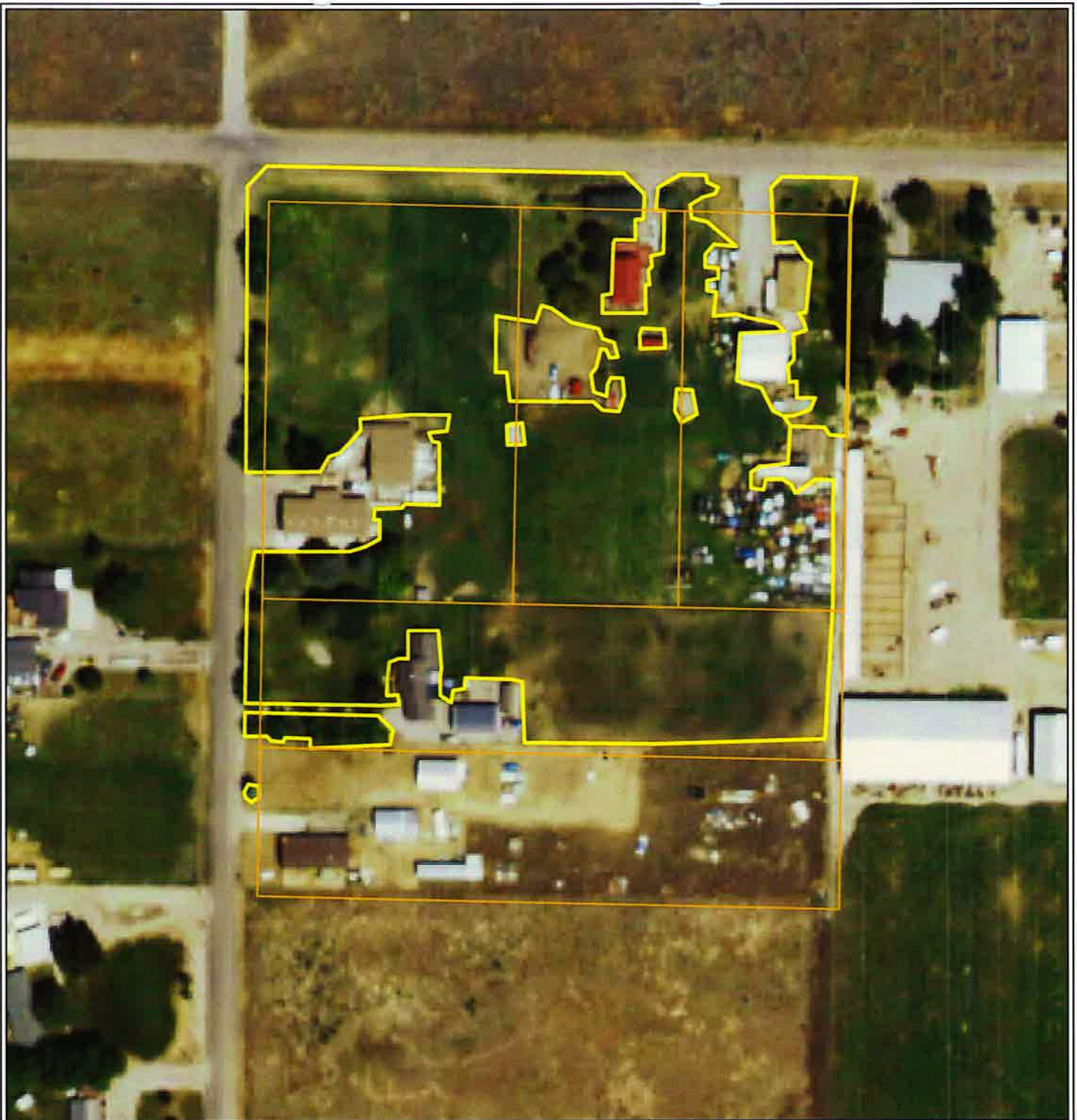
Project #: 21-0271

Drawn by: AD

Date: 5/3/2022



Rocky Mountain
ENVIRONMENTAL
ASSOCIATES, INC.



0 0.02 0.04 0.07 Miles

2019 NAIP

- 2019 Irrigated Acres
- Parcels

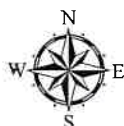


Figure 7: Historical Aerial 2019

Tirrell Water Users, Inc.

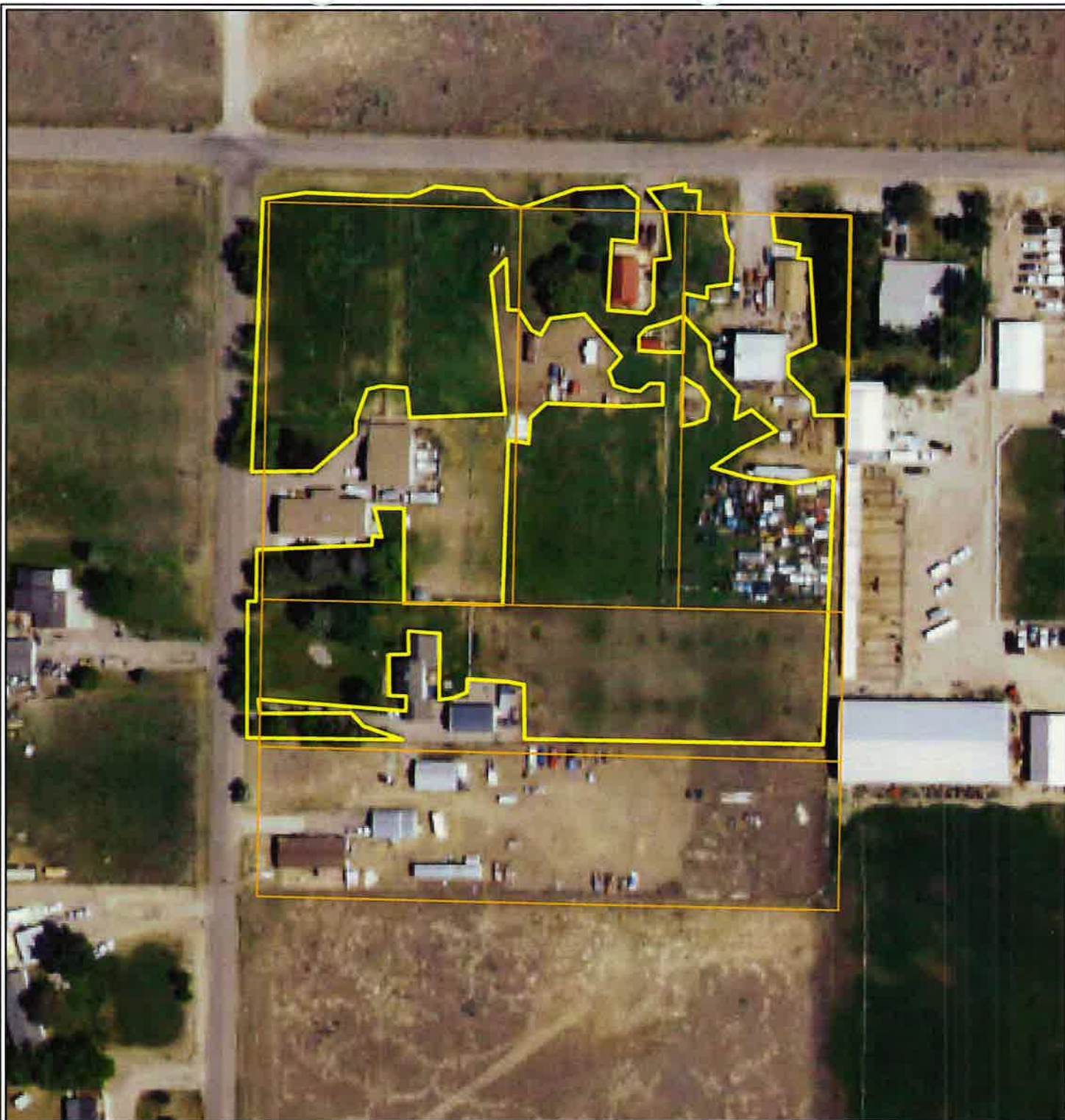
Project #: 21-0271

Drawn by: AD

Date: 5/3/2022



Rocky Mountain
ENVIRONMENTAL
ASSOCIATES, INC.



0 0.02 0.04 0.07 Miles

2021 NAIP

- 2021 Irrigated Acres
- Parcels



Figure 8: Historical Aerial 2021

Tirrell Water Users, Inc.

Project #: 21-0271

Drawn by: AD

Date: 5/3/2022



Rocky Mountain
ENVIRONMENTAL
ASSOCIATES, INC.

ATTACHMENT B – SITE PHOTOGRAPHS



Photo 1. Tirrell Water Users Inc. well on Brower property, viewing north.



Photo 2. Hose sprinkler on west end of Kulicke pasture. Note pneumatic tank house in background.



Photo 3. Entrance of 3-inch line from well into tank house.



Photo 4. Manifolding of water line to five hydropneumatics tanks in tank house. Note pressure switch and gage.



Photo 5. Hydropneumatic tank technical label, typical of each of five tanks.



Photo 6. Three tanks on north side of tank building interior.



Photo 7. Two tanks on south side of tank building interior.



Photo 8. Technical label for submersible well pump.

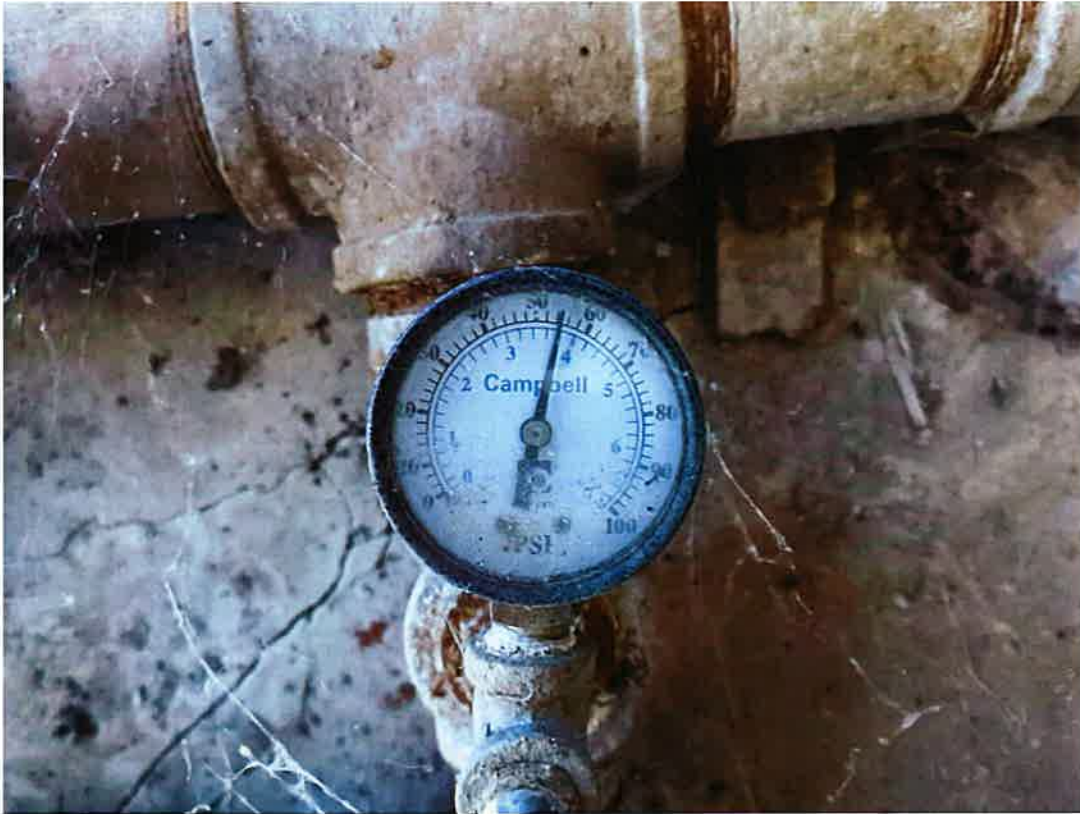


Photo 9. Tank house pressure gage with no systems running (55 psi).



Photo 10. Tank house pressure gage with largest system running (42 psi).



Photo 11. Brower west pasture wheel line in operation, viewing northwest.



Photo 12. Brower east pasture wheel line in operation, viewing northeast.



Photo 13. Brower southeast pasture wheel line, viewing east.



Photo 14. Kulicke yard center riser, viewing west.



Photo 15. Kulicke pasture hand line in operation, viewing east.



Photo 16. Fence between Farrell and Potter pastures, fence mounted line in operation, viewing north.



Photo 17. Farrell pasture, livestock, and hand line, viewing northwest.



Photo 18. Potter pasture and hose, viewing north.



Photo 19. Kulicke hose bib on south side of yard.



Photo 20. Turinbeauch house and field, viewing southwest.

ATTACHMENT C – PUMP CURVE

Model 60S

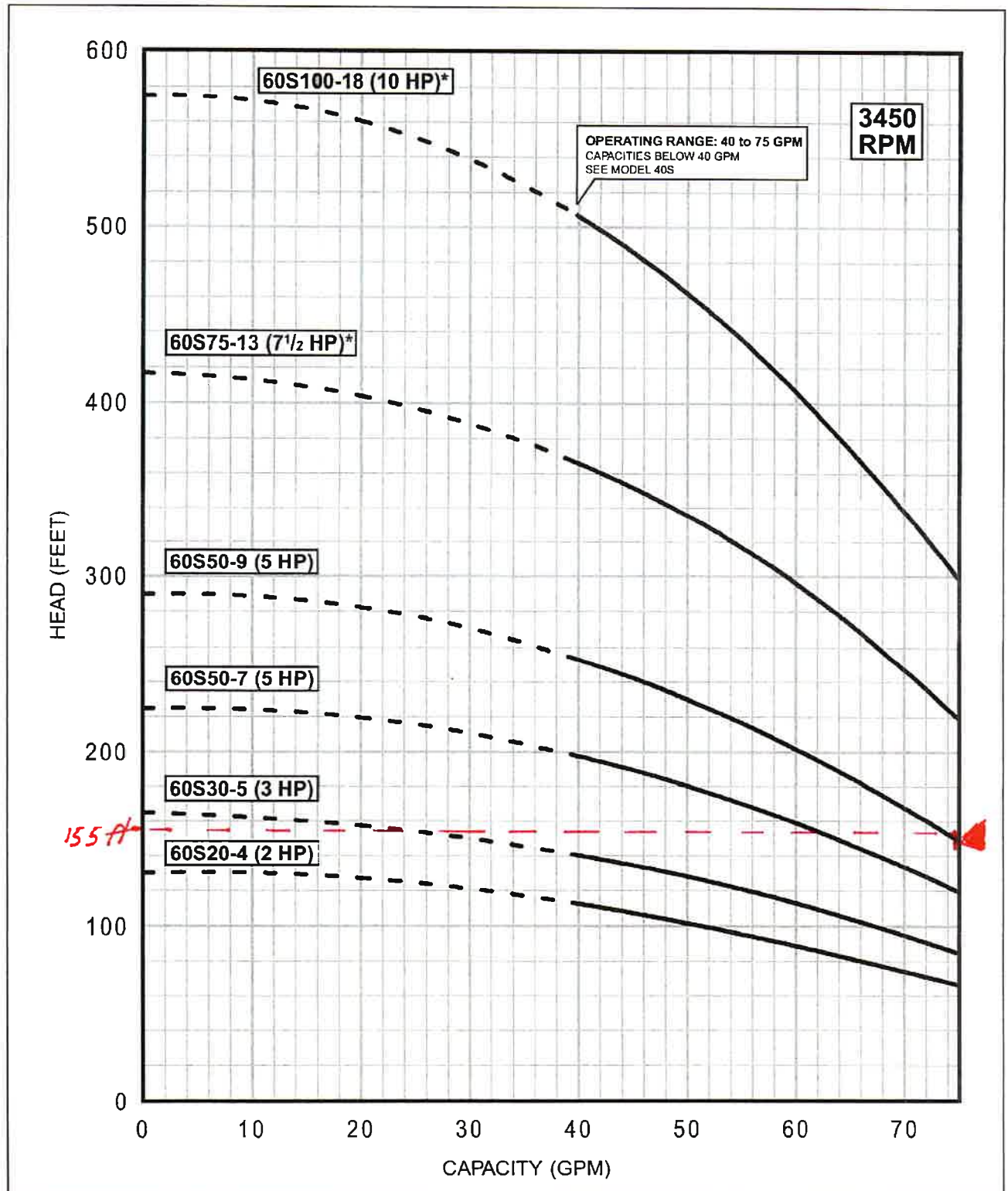
60 GPM

Performance Curves

FLOW RANGE: 40 -75 GPM

OUTLET SIZE: 2 " NPT

NOMINAL DIA. 4"



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

* Also available with 6" motor.

Performance conforms to ISO 2548 Annex B
@ 5 ft. min. submergence.

ATTACHMENT D – SPRINKLER NOZZLE CAPACITIES



Agricultural Irrigation Products 2014-2015 Catalog



A Legacy of Agricultural Innovation

IRRIGATION-MART
we *SAVVY* irrigation

20JH

1/2" 13mm Full Circle, Brass Impact Sprinkler

- Durable brass die-cast arm
- Stainless steel springs and fulcrum pin
- Corrosion and grit resistant

Features

- Chemically resistant PTFE washers

Benefits

- Spoon drive arm runs on larger nozzles and higher pressures
- Built to last
- Five-year Customer Satisfaction Policy

Specifications

- Bearing: 1/2" Male NPT, Brass
- Trajectory Angle: 23°
- Operating Range: 35-60 psi 2.4-4.1 bar
- Flow Rate: 2.05-4.7 gpm 0.47-1.24 m³/h
- Radius: 38-44 ft 11.6-13.4 meters
- One 1/8" Female NPT Nozzle Port



Straight Bore Nozzle (SBN-1) Performance*						
psi @ Nozzle	NOZZLE SIZE (Stream Height: 6 ft.)					
	7/64"		1/8"		9/64"	
	Rad.	gpm	Rad.	gpm	Rad.	gpm
35	38	2.05	38	2.68	39	3.39
40	38	2.19	39	2.86	40	3.62
45	39	2.32	39	3.03	40	3.84
50	39	2.45	39	3.20	40	4.05
55	39	2.57	40	3.35	40	4.24
60	39	2.68	40	3.50	41	4.43

Straight Bore Nozzle with Vane (SBN-1V)*						
psi @ Nozzle	NOZZLE SIZE (Stream Height: 7 ft.)					
	1/8"		9/64"		5/32"	
	Rad.	gpm	Rad.	gpm	Rad.	gpm
35	39	2.68	41	3.39	42	4.19
40	40	2.86	41	3.62	42	4.47
45	40	3.03	42	3.84	42	4.73
50	41	3.20	42	4.05	43	5.00
55	41	3.35	43	4.24	43	5.23
60	41	3.50	43	4.43	44	5.47

Straight Bore Nozzle (SBN-1) Performance*						
bar @ Nozzle	NOZZLE SIZE (Stream Height: 1.8m)					
	2.78 mm (7/64")		3.18 mm (1/8")		3.57 mm (9/64")	
	Rad. (m)	Flow (lps) (m³/h)	Rad. (m)	Flow (lps) (m³/h)	Rad. (m)	Flow (lps) (m³/h)
2.4	11.6	0.13 0.47	11.7	0.17 0.61	12.0	0.21 0.77
2.5	11.6	0.13 0.47	11.8	0.17 0.62	12.1	0.22 0.78
3.0	11.8	0.14 0.52	12.0	0.19 0.68	12.2	0.24 0.86
3.5	11.9	0.16 0.56	12.1	0.20 0.73	12.3	0.26 0.93
4.0	12.0	0.17 0.60	12.2	0.22 0.78	12.4	0.27 0.99
4.1	12.0	0.17 0.61	12.2	0.22 0.79	12.5	0.28 1.01

Straight Bore Nozzle with Vane (SBN-1V)* METRIC						
bar @ Nozzle	NOZZLE SIZE (Stream Height: 2.1m)					
	3.18 mm (1/8")		3.57 mm (9/64")		3.97 mm (5/32")	
	Rad. (m)	Flow (lps) (m³/h)	Rad. (m)	Flow (lps) (m³/h)	Rad. (m)	Flow (lps) (m³/h)
2.4	12.0	0.17 0.61	12.5	0.21 0.77	12.8	0.26 0.95
2.5	12.1	0.17 0.62	12.5	0.22 0.78	12.8	0.27 0.97
3.0	12.3	0.19 0.68	12.8	0.24 0.86	13.0	0.29 1.06
3.5	12.5	0.20 0.73	13.0	0.26 0.93	13.1	0.32 1.14
4.0	12.5	0.22 0.78	13.2	0.27 0.99	13.3	0.34 1.22
4.1	12.5	0.22 0.79	13.3	0.28 1.01	13.4	0.35 1.24

* Available without Nozzle or Assembled with either a 7/64" (07) or 1/8" (08) Straight Bore Nozzle. All other Nozzles must be purchased separately. See Chart below.

Part Numbers and Ordering Information

Sprinkler Only	
Sprinkler without Nozzle	A05840

Assembled Sprinkler/Nozzle Factory Combination	
Sprinkler with Nozzle SBN-1 7/64"	A0584107
Sprinkler with Nozzle SBN-1 1/8"	A0584108

Nozzle Only			XX = Nozzle Size			
U.S. Standard			7/64"	1/8"	9/64"	5/32"
Metric			2.78 mm	3.18 mm	3.57 mm	3.97 mm
Brass Straight Bore Nozzle	SBN-1	105780-XX	07	08	09	10
Brass Straight Bore Nozzle with Vane	SBN-1-V	106160-XX	—	08	09	10

Bold nozzle size numbers denote the most common nozzle choices.

ATTACHMENT E – CALCULATIONS

Calculations

1. Pump capacity from pump curve (Grundfos MS4000 Model 60S50-9, 5.0 HP 50 Hz):
 - a. System pressure
 - i. From pressure gage in tank house, pre-pumping head P1 (should reflect static pressure) = $55 \text{ psi} \times 2.31 \text{ ft/psi} = 127 \text{ ft}$
 - ii. From pressure gage in tank house, pumping pressure head P2 while pumping largest capacity irrigation line = $42 \text{ psi} \times 2.31 \text{ ft/psi} = 97 \text{ ft}$
 - b. Drawdown head (h) = $P1 - P2 = 127 \text{ ft} - 97 \text{ ft} = 30 \text{ ft}$
 - c. Static water level (SWL) from attached well log = 28 ft (estimated)
 - d. Total Dynamic Head (TDH) while pumping:
 - i. $P2 + h + \text{SWL} = 97 \text{ ft} + 30 \text{ ft} + 28 \text{ ft} = 155 \text{ ft}$
 - e. From attached pump curve, pumping rate Q_p at 155 ft TDH
 - f. Pump capacity $Q_p = 75 \text{ gpm}/448.8 \text{ gpm/cfs} = \mathbf{0.17 \text{ cfs}}$
2. Allowable diversion rate = 0.02 cfs per acre.
 - a. Historical irrigation is estimated at 5.4 acres.
 - b. $5.4 \text{ acres} \times 0.02 \text{ cfs/acre} = \mathbf{0.11 \text{ cfs}}$.
 - c. The allowable diversion rate is less than the pump capacity, therefore the pump system is adequate for the allowable diversion rate.
3. Flowrate from nozzles:
 - a. Largest discharge lines are:
 - i. 2-inch fence-mounted line, 9 impact sprinkler heads, 5/32-inch nozzles
 1. From attached rainbird nozzle chart,
 - a. At 40 psi, discharge rate per nozzle $q_n = 4.47 \text{ gpm}$
 - b. At 45 psi, $q_n = 4.73 \text{ gpm}$
 - c. At 42 psi, $q_n = 4.47 + [(4.73 - 4.47) \times 2/5] = 4.57 \text{ gpm}$
 2. $9 \text{ nozzles} \times 4.57 \text{ gpm/nozzle} = 41.1 \text{ gpm} = 0.092 \text{ cfs}$
 - ii. 4-inch wheel line, 5 impact sprinkler heads, 9/64-inch nozzles
 1. From attached rainbird nozzle chart,
 - a. At 40 psi, $q_n = 3.62 \text{ gpm}$

- b. At 45 psi, $q_n = 3.84$ gpm
 - c. At 42 psi, $q_n = 3.62 + [(3.84 - 3.62) \times 2/5] = 3.71$ gpm
 - 2. 5 nozzles at 3.71 gpm/nozzle = 18.6 gpm = 0.041 cfs
- iii. 4-inch wheel line, 4 impact sprinkler heads, 9/64-inch nozzles (there are two identical lines)
 - 1. As above, each nozzle will discharge 3.71 gpm at 42 psi
 - 2. 4 nozzles x 3.71 gpm/nozzle = 14.84 gpm = 0.033 cfs
- iv. One 3-inch hand line, seven impact sprinkler heads, 1/8-inch nozzles
 - 1. From attached Rainbird chart,
 - a. At 40 psi, $q_n = 2.86$ gpm
 - b. At 45 psi, $q_n = 3.03$ gpm
 - c. At 42 psi, $q_n = 2.86 + [(3.03 - 2.86) \times 2/5] = 2.93$ gpm
 - 2. 7 nozzles x 2.93 gpm/nozzle = 20.5 gpm = 0.046 cfs
- v. No individual system exceeds the allowable diversion rate of 0.11 cfs.
- vi. Various combinations of systems can be run without exceeding 0.11 cfs. For example, two 4-nozzle wheel lines (2 x 0.033 cfs) + one 5-nozzle wheel line (0.041 cfs) = 0.107 cfs.