Tri-Basin Irrigator

Volume 20, Issue 6 **July 23, 2020**

Program Information

EQIP: **Contracts currently being written on pre-approved applicants. As additional funds become available, additional pre-approvals may take place.**

CSP: **New 2020 pre-approved applications are currently having contracts signed and submitted for official contract obligation. – Renewal applications will be assessed and ranked for pre-approval in the near future.**

NSWCP: **New funds have arrived. Get your irrigation applications in by August 31st for first chance approvals.**

ENERGY EFFICIENCY GRANT: **Sign-up deadline for 2021 funds is October 31, 2020. For more information contact Kelley at Rural Development at the Kearney USDA Service Center at 308-455-9837 or *kelley.messenger@usda.gov*.**

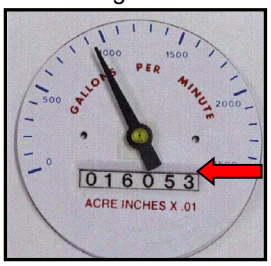
Calendar of Events

Aug 3: CNPPID Board of Directors Meeting
Aug 11: TBNRD Board Meeting
Aug 27: Virtual WC Water and Crops Field Day. More information forthcoming

Flow Meter Accuracy!

I get calls from producers wondering if their flow meters are reading accurately. An example of this is my pivot is set up for 800 gpm yet the needle on my flow meter says 500 gpm. The majority of the flow meters across the Tri-Basin NRD are McCrometers, so these are the ones I will be focusing on. The same concept may apply on other brands.

The needle on the readout display is a guide. Sometimes the needle bounces around, the unit display is too broad for accuracy, or it can just plainly be out of sync. To determine actual flow rate, one needs to time the odometer. When timing, I look straight into the odometer and start the timer when the top of the far-right rotating digit (fastest) hits the bar across the top. See photo. Then I do the same when reading the ending reading. Having the same eye angle and reading the same location will provide a more accurate reading.



Depending upon the odometer units, the far-right digit can move faster or slower. The slower it moves, the more critical it is for consistent eye angle and a very defined start / stop point.

I like to time the odometer for at least 10 minutes. For a slower rotating odometer, a longer time will help in accuracy.

Attached to this newsletter is a 2-page sheet. The first shows different flow meter faces and units. The second page shows how to convert the varying units to gallons. Towards the bottom, it shows how to calculate the timed gallons to gallons per minute.

In closing, the needle is a guide. The odometer is the official record.

Curtis's Column

Soil Moisture Sensor Locations on SDI Fields:

I am going to talk about our TAPS field and the soil moisture sensor locations to hopefully shed some light on the matter.

In 2020, we have yet to see any spike-ups this year after irrigations on the soil moisture charts. We have seen some leveling off however. I believe this lack of spike-ups to be from a variety of things such as distance from emitters, soil, and crop ET's higher than water applications. Other factors may include no rain, hybrid, population, etc.

As this year progressed through the vegetative stages, the sensors kept getting drier due to no rain or irrigation. Once we decided to irrigate, the sensors did not change, they kept drying down. So we were wondering if our corn was getting irrigated. It was. The picture shows the wet spot at the surface which shows an emitter location. So picture a vertical oval of irrigated soil with soil moisture sensors between these wet areas of soil. Even though the sensors are not showing spike-ups, the crops were getting water. The day this photo was taken, the sensors did not show a spike-up from the irrigation. Yet you can see it was irrigated. This might be why one sees waves in an SDI field in drier years. This could also be why water applications on SDI fields could surpass pivot applications. The same goes when probing the soil, depending where the probe goes, so goes irrigation.

I will end this by saying, SDI is a good efficient irrigation system. Soil Moisture Sensors are a great tool for scheduling irrigations. One just needs to understand how they work, they need to know the situation at hand by staying involved by asking questions to the dealers and crop consultants, and by going to the field to verify and learn what is going on. It is no different than any other tool. We purchase tools, items, technology. We learn how they work. Adjustments are made.

CSP Contract Holders!!!

Water Sample REMINDER!!!

Irrigation water samples, testing for nitrates, are required for all CSP Nutrient Management activities. With irrigation in full swing, it would be a great time to gather samples.

For CSP purposes, one irrigation water sample is required per well for the 5-year CSP contract.

CSP requirements do not eliminate the need to follow NRD irrigation water testing rules and regulations. In the Tri-Basin NRD, if you have irrigated land in the Phase II or Phase III Groundwater Quality Management Area, you are required to test irrigation water for nitrates every year. See article on page 2 under Tri-Basin NRD News for more information. For those of you with irrigated land outside the Tri-Basin NRD, you will need to check with your local NRD if you have questions concerning their irrigation water testing requirements.

If you have any questions about your CSP contract, contact your local NRCS office.

CNPPID Notes

Aquatic Weed Treatment:

Aquatic weeds, such as filamentous algae, moss, and sago pondweed, can make delivering surface water through a canal system difficult without using chemical treatments throughout the irrigation season.

Central's irrigation division is constantly on the lookout for these aquatic weeds to treat before they grow and hinder the delivery of surface water for irrigation. Filamentous algae and moss start as hair like strands that grow toward the water's surface, eventually forming floating mats on the water's surface.

Sago pondweed is a bottom rooted aquatic weed that grows up towards the water's surface and grows very thick, which can eventually stop the movement of water. These aquatic weeds can break off and plug the screening of the irrigation delivery point, stopping the flow of water to the irrigation system.

Treatment of these aquatic weeds is expensive; the cost of the chemicals can range from $30 to $80 per gallon. Chemicals are applied by gravity drippers, injection pumps, slug treatment, or surface sprayed. All of the chemicals Central uses to control aquatic weeds are labeled to be safe for the irrigation water and the crops.

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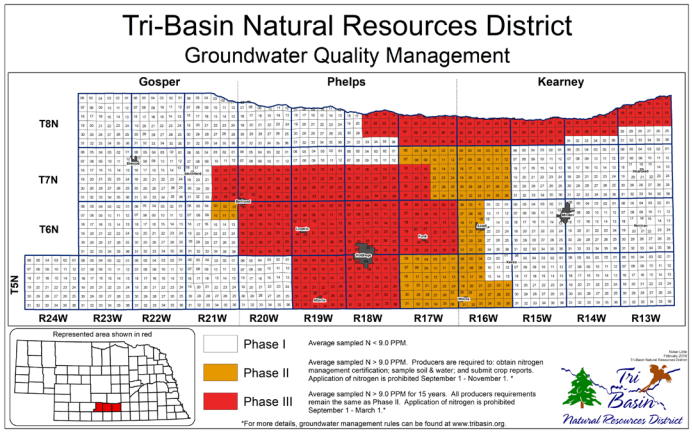
Tri-Basin NRD News

Time to Take a Water Sample

If you have a field in Phase II or Phase III Groundwater Quality Management Area (map below), you are required to sample your irrigation water and test it for nitrates every year. It is important to collect the water samples once you start irrigating. Take the sample after the well has been running for a while, so you have accurate results.

The results from the samples you take this irrigation season will be used in nitrogen planning for next year's crop and reported on your 2021 Nitrogen Management Crop Report. Sample bottles are available at Tri-Basin NRD or NRCS offices.



ET Data Texts: To enroll text ETDATA to 80123

Nebraska Extension Extras

New 2020 Nebraska Ag Custom Rates Available:

The NEW 2020 Nebraska Extension Agricultural Customs Rates Statewide Survey summary is now available published. This UNL Extension Circular (EC) 823 provides custom rates for eight Nebraska Statistics Districts and is available free-of-charge online at: https://farm.unl.edu/customrates.

As might be expected, many custom rates have increased since it was last published in 2018. The state summary includes rates where at least six or more responses were provided.

Southern Rust Confirmed in Corn:

Southern Rust has now been confirmed in Fillmore, Nuckolls and Johnson counties this past week. Tamra Jackson-Ziems, Nebraska Extension Pathologist, says that although incidences are still low; warm, humid conditions favor this disease.

Although foliar fungicides can effectively manage this disease, application timing is critical and likely is not recommended yet. Since fungicide applications sprayed during 'tassel stage' will only last 21-28 days, early treated fields may require a reapplication.

More information is available in our Nebraska Extension NebGuide 1680 'Rust Diseases of Corn in Nebraska' or our https://cropwatch.unl.edu website.

Western Corn Rootworm:

Julie Peterson and Robert Wright, Nebraska Extension Entomologists, advise scouting now for both Western Corn Rootworm and Western Bean Cutworms.

Western corn rootworm beetles usually begin their life cycle feeding on corn leaves, but prefer corn silks, so these insects change their feeding food preference during corn pollination/silking. Yield losses can be significant if corn rootworm numbers cause high silk clipping on corn ears. Beetle control threshold levels are based on corn plant populations along with insect counts.

The first beetles to emerge are usually male, and females require at least 10-14 days of feeding before they lay eggs. Treatments applied too early may be ineffective if large numbers of females emerge after the residual effectiveness. Another concern has been some pyrethroid (bifenthrin) insecticide resistance developing in some regions.

2020 Virtual UNL Weed Management Field Days:

COVID-19 continues to alter our Nebraska Extension public program delivery. Therefore, our UNL South Central Ag Lab @ Clay Center Summer Field Day and "Resistant Palmer Amaranth Management Field Day are both virtual for 2020.

Featured topics for the Virtual South Central Lab are listed at: https://go.unl.edu/2020weedfieldday. Topics include: Comparison of Herbicide Programs for Soybean Weed Control; Xtend Flex Soybean Weed Control; Enlist / Authority Soybean Weed Control; Terminating Cereal Rye Cover Crops in Soybeans; Corn Herbicide Weed Control Programs; Atrazine (Pre-emergence Weed) Alternatives, and Popcorn Herbicide Control of johnsongrass and foxtail species.

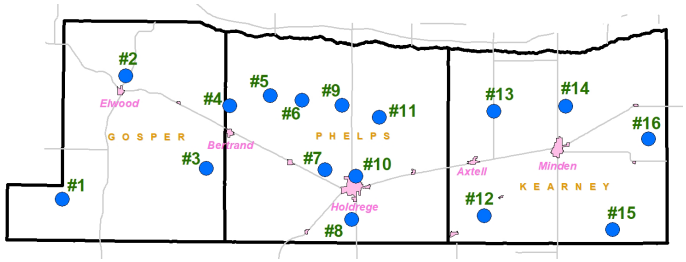
Featured topics for the Virtual Atrazine, Glyphosate, and ALS inhibitors-resistant Palmer Amaranth Management Field Day are available at: https://go.unl.edu/palmer-amaranth2020. Topics include: Row spacing and Herbicide Programs for Control of Resistant Palmer amaranth; & resistant management for Enlist E3 Corn; non-GMO white corn, & herbicides rotation.

NAWMN Crop ET Information

Additional Information and other ET resources can be found at websites listed under "Crop ET Information" below.

Inches of Crop Water Use (ET) = Evaporation x Kc

	July 6 – July 12		July 13 – July 19	
Site	Evaporation	Rain	Evaporation	Rain
1	2.10	0.96	1.80	0.46
2	1.90	0.60	1.50	0.98
3	1.90	1.06	1.60	0.34
4	1.70	0.49	1.60	0.48
5	NA	NA	NA	NA
6	1.80	0.58	1.70	0.40
7	1.90	0.66	1.60	0.54
8	1.50	0.53	1.50	1.35
9	1.70	0.66	1.50	0.20
10	NA	NA	NA	NA
11	1.90	0.59	1.60	0.60
12	1.70	0.38	1.50	0.29
13	1.50	0.87	1.50	0.13
14	1.70	1.76	1.80	0.09
15	1.90	0.85	1.60	0.34
16	1.60	0.82	1.60	0.07



2020 Map of NAWMN Sites across the Tri-Basin NRD.

Crop Coefficients (Kc)

Corn Stage	Kc	Soybeans Stage	Kc
2 leaf	0.10	Cotyledon (VC)	0.10
4 leaf	0.18	1st Node (V1)	0.20
6 leaf	0.35	2nd Node (V2)	0.40
8 leaf	0.51	3rd Node (V3)	0.60
10 leaf	0.69	Beg. Bloom (R1)	0.90
12 leaf	0.88	Full Bloom (R2)	1.00
14 leaf	1.01	Beg. Pod (R3)	1.10
16 leaf	1.10	Full Pod (R4)	1.10
Silk – Beg. Dent	1.10	Beg. Seed (R5)	1.10
¼ Milk Line	1.04	Full Seed (R6)	1.10
Full Dent (½ Milk)	0.98	Yellow Leaf (R6.5)	1.00
¾ Milk Line	0.79	Beg. Mat. (R7)	0.90
Black Layer	0.60	Full Mat. (R8)	0.20
Full Maturity	0.10	Mature	0.10

Crop Stage Information

Corn (V18-18 Leaf to R2-Blister stage): We are at the peak water use stages of corn. Nitrogen and Phosphorous uptake is rapid. Environmental stress at this time can greatly reduce yield.

Avg. daily water use from July 13 – July 19 was 0.24"-0.28".

Soybeans (R2-Full Bloom to R4-Full Pod stage): Demand for water and nutrients is large throughout the rapid seed filling period. Environmental stress from now til shortly after R6 (Full Seed) needs to be avoided.

Avg. daily water use from July 13 – July 19 was 0.21"-0.28".

July 13-July 19 (14 of 16 NAWMN sites reporting): Average weekly rainfall was 0.45 (range 0.07 to 1.35). Average weekly ET for corn was 1.77 and for soybeans was 1.70.

Crop ET Information

NAWMN Sites:
https://www.cnppid.com/weatheret-data/nebraska-agricultural-water-management-network/
https://nawmn.unl.edu/ETdata/DataMap
Email: NRCS: 308-995-6121, Ext. 3
CropWatch: https://cropwatch.unl.edu/gdd-etdata
CNPPID: https://www.cnppid.com/weatheret-data/
Texting: TBNRD: 308-995-6688 or UNL: 308-995-4222
Email: CNPPID: 308-995-3555

Corn Stage		DESCRIPTION
R1	Silking	Begins when any silks are visible outside the husks.
R2	Blister	The kernels are white on the outside and resemble a blister in shape. The cob should be close if not at full size by R2. The silks are drying and darkening in color.
R3	Milk	The kernels display a yellow color on the outside. Inner fluid is milky white. Silks are brown and dry or becoming dry.

Soybean Stage		DESCRIPTION
R3	Beginning Pod	At least one pod of 3/16" length is present at any 1 of the 4 upper most main stem nodes with a fully developed leaf. There can be pods of greater length at the lower nodes.
R4	Full Pod	At least one pod of 3/4" length is present at one of the four uppermost main stem nodes that have fully developed leaves.
R5	Beginning Seed	At least one pod containing small seeds is present at one of the four uppermost main stem nodes that have fully developed leaves. Holding a pod up to the bright sky will show small developing seeds in the pod cavities.

Lake and River Levels

CNPPID Reservoir Elevation and Platte River Flow data listed below and other locations can be found on CNPPID's website at *http://cnppid.com/wp-content/uploads/2016/06/lakeRiverData.html*.

	July 23, 2020, 8:00 AM	*1 Year Ago*
Capacity of Lake McConaughy	**72.1%**	**NA**
Inflows to Lake McConaughy	**558 cfs**	**1240 cfs**
Flows on the North Platte at North Platte	**2540 cfs**	**620 cfs**
Flows on the South Platte at North Platte	**172 cfs**	**403 cfs**
Flows on the Platte at Overton	**1410 cfs**	**2680 cfs**

Don't let people pull you into their storm. Pull them into your peace.

- Kimberly Jones

Websites of Interest

Soil Health: *www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/*

Climate	*agclimatenebraska.weebly.com*
NRCS Nebraska	*www.ne.nrcs.usda.gov*
Central Irrigation District	*www.cnppid.com/*
TBNRD Home Page	*www.tribasinnrd.org/*
Farm Service Agency	*www.fsa.usda.gov*
UNL Cropwatch	*cropwatch.unl.edu*
UNL Extension	*extensionpubs.unl.edu/*
K-State SDI Website	*www.ksre.ksu.edu/sdi*
No-till On The Plains	*www.notill.org*

Rainfall

Rainfall amounts listed below and other locations come from NeRAIN which can be found at website *https://nednr.nebraska.gov/NeRain/Maps/maps*.

Location:	July 9 – July 22	May 1 – July 22
Elwood 0.26 mi. S:	**3.10**	**7.90**
Bertrand 6.1 mi. SE:	**2.80**	**9.66**
Holdrege 0.99 mi. E:	**2.03**	**7.66**
Minden 7.2 mi. W:	**0.78**	**8.80**
Minden 5.8 mi. E:	**1.83**	**10.79**

Average Rain for May-July in Holdrege = 11.32 Inches

**** If you wish to receive this newsletter via e-mail, or have any questions, comments or ideas, feel free to contact Curtis Scheele at the NRCS office in Holdrege or you can email him at **curtis.scheele@usda.gov**. ****

USDA - Natural Resources Conservation Service

1609 Burlington Street
PO Box 798
Holdrege, NE 68949-0798
308-995-6121, Ext. 3

309 Smith Street
PO Box 41
Elwood, NE 68937-0041
308-785-3307, Ext. 3

1005 South Brown Street
Minden, NE 68959-2601
308-832-1895, Ext. 3

Central Nebraska Public Power & Irrigation District

415 Lincoln Street
PO Box 740
Holdrege, NE 68949
308-995-8601

Tri-Basin Natural Resources District

1723 Burlington Street
Holdrege, NE 68949
308-955-6688

Nebraska Extension

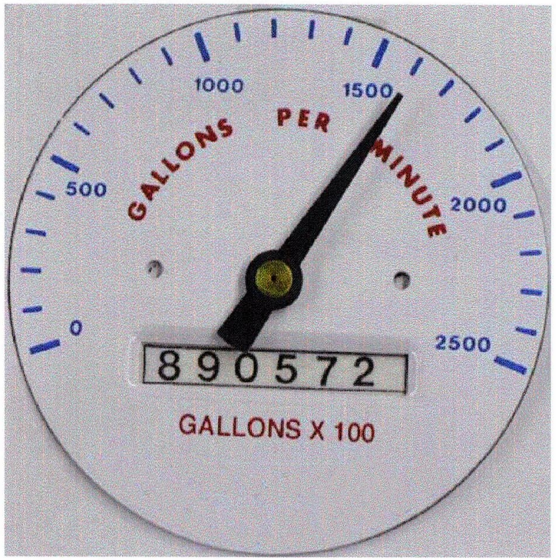
1308 2nd Street
Holdrege, NE 68949

308-995-4222

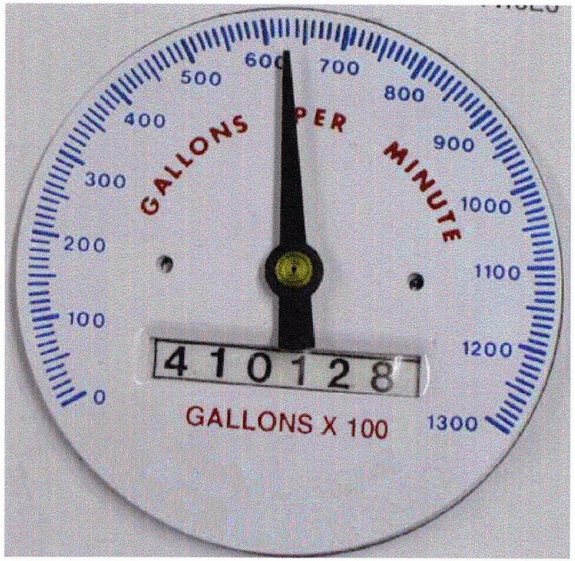
PO Box 146
Elwood, NE 68937

308-785-2390

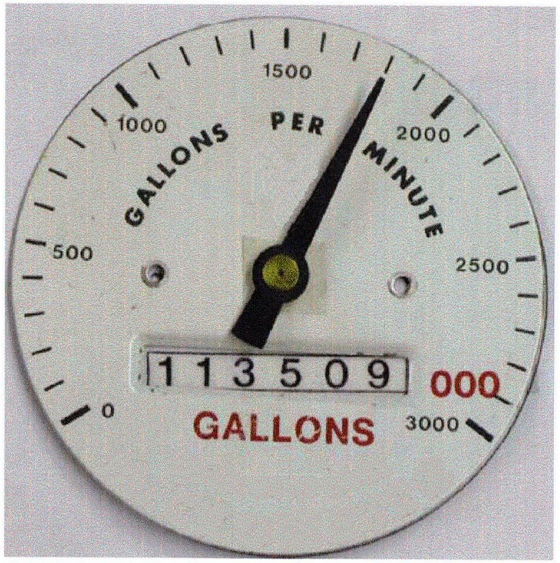
424 North Colorado
PO Box 31
Minden, NE 68959
308-832-0645



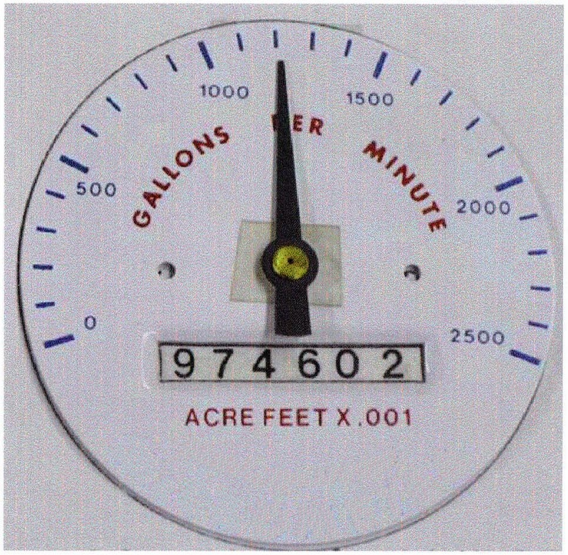
8" Dial Face with Gallon Totalizer x 100
Add 2 zeros to the 6-digit dial face reading.
Total Gallons = 89,057,200



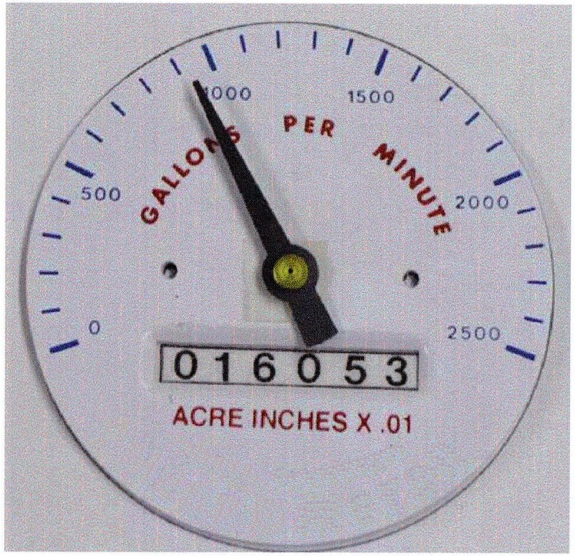
6" Dial Face with Gallon Totalizer x 100
Add 2 zeros to the 6-digit dial face reading.
Total Gallons = 41,012,800



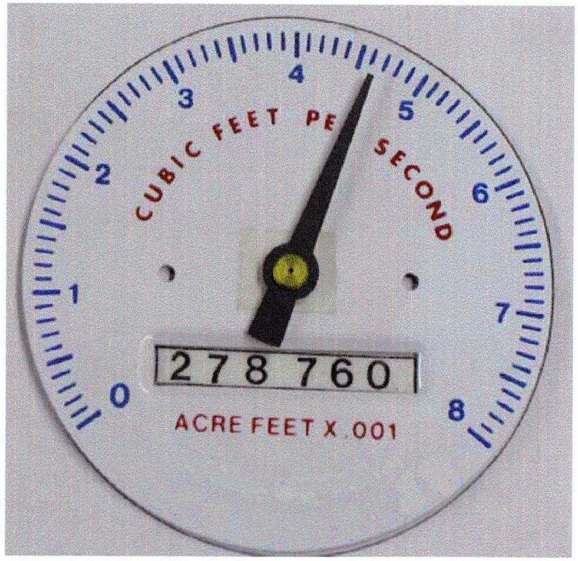
10" Dial Face with 3 fixed zeros.
Include these zeros in your reading.
Total Gallons = 113,509,000



8" Dial Face with Acre Feet Totalizer x .001 and GPM Flow Rate Indicator. Place a Decimal Point 3 places to the left. Acre Feet = 974.602



8" Dial Face with Acre Inches Totalizer x .01 and GPM Flow Rate Indicator. Place a Decimal Point 2 places to the left.
Acre Inches = 160.53



Dial Face with Cubic Feet Per Second flow rate and Acre Feet Totalizer. Place a Decimal Point 3 places to the left. Acre Feet = 278.760

WATER EQUIVALENTS TABLE

1 acre-foot of water……..325,851 gallons (12" of water over 1 acre)
1 acre-inch of water……..27,154 gallons (1" of water over 1 acre)
800 gallons per minute ……3.54 acre-feet or 42.42 acre inches per day
450 gallons per minute = 1 cubic foot per second = 2 acre feet per day = 24 acre inches per day

WATER CALCULATIONS

…. To convert gallons totalizer readings to acre-feet

divide gallons used by 325,851

Example:…….present meter reading	89,057,200	gallons
subtract previous reading	48,563,000	gallons
gallons used =	40,494,200	gallons
acre-feet used = gallons used ÷ 325,851 =	124.27	acre feet

….To convert gallons totalizer readings to acre-inches

divide gallons used by 27,154

Example:…….present meter reading	41,012,800	gallons
subtract previous reading	31,444,300	gallons
gallons used =	9,568,500	gallons
acre-inches used = gallons used ÷ 27,154	532.38	acre-inches

….To convert acre-feet totalizer readings to gallons

multiply acre-feet used by 325,851

Example:…….present meter reading	278.760	acre-feet
subtract previous reading	267.334	acre-feet
acre-feet used =	11.426	acre-feet
gallons used = acre-feet used x 325.851 =	3,723,173.53	gallons

….To convert acre-inch totalizer reading to gallons

multiply acre-inches used by 27,154

Example:…….present meter reading	160.530	acre-inches
subtract previous reading	99.560	acre-inches
acre-feet used =	60.970	acre-inches
gallons used = acre-inches used x 27,154	1,655,579.38	gallons

….To check accuracy of the flow rate indicator:

Record the time it takes for several complete revolutions of the far right odometer wheel. Divide the gallons recorded by the time in seconds and then multiply by 60 to get Gallons Per Minute. Your calculations should give you the same rate as the meter needle shows.

….To make calculations if your register rolls over:

Subract end of previous year reading from 1000 acre feet and add amount currently showing on meter. Example: End of 1992-920.328 AC FT & End of 1993-138.491 AC FT
1000 – 920.328 = 79.672 AC FT + 138-491 AC FT = 218.163 ACRE FEET used 1993

calcs.wrl