United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
WESTERN REGIONAL OFFICE
2600 North Central Avenue
Phoenix, Arizona 85004

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
Division of Natural Resources

NOV 28 2018

Honorable Dennis Patch
Chairman, Colorado River Tribe
26600 Mohave Road
Parker, Arizona 85344

Dear Chairman Patch:

On October 10, 2018 representatives of the Bureau of Indian Affairs (BIA) and the Bureau of Reclamation met with representatives of the Colorado River Indian Tribes (Tribes) in order to engage in a 43 CFR, Part 417 (Part 417) consultation with the Tribes. Part 417 obligates the BIA to see that releases of Colorado River water to tribal entities do not exceed those reasonably required for beneficial use. During this consultation meeting the Tribes' 2019 Colorado River water usage requirements and plans were discussed.

With consideration given to discussion held at the aforementioned consultation meeting and in fulfillment of responsibilities described in Part 417, the Regional Director, Western Regional Office, has formally determined the Tribes' 2019 Colorado River water order. This water order is provided in the table below and corresponds with the diversion schedule previously submitted by the Tribes to the BIA. The estimated quantities to be conserved through the Tribes' System Conservation Implementation Agreement with the Bureau of Reclamation have been incorporated. A copy of the diversion schedule submitted by the Tribes, along with the Tribes' completed Consultation Questionnaire, is enclosed.

The Tribes' 2019 water order is (all quantities in acre-feet):

Month	Arizona				California
	Diversion at Headgate Rock Dam	Diversion Reduction	Other Diversions	AZ Totals	
JAN	15,962	639	414	15,737	187
FEB	36,592	991	479	36,080	225
MAR	59,485	1,414	469	58,540	307
APR	69,278	2,088	514	67,704	332
MAY	77,417	2,492	622	75,547	404
JUN	79,183	2,511	744	77,416	488
JUL	81,336	2,492	807	79,651	531
AUG	71,535	2,563	1,019	69,991	508
SEP	55,298	2,091	823	54,030	407
OCT	44,371		714	45,085	344
NOV	31,006		527	31,533	249
DEC	33,298		509	33,807	238
TOTAL	654,761	17,281	7,641	**645,121**	**4,220**
ENTITLEMENT	662,402				56,846

This water order is being submitted to the Bureau of Reclamation for Colorado River water regulation and accounting purposes.

Please direct any questions to Mr. Jonathan Cody, Irrigation Engineer, at (602) 379-6789.

Sincerely,

Regional Director

Enclosures

cc: ✓Regional Director, BOR LCRO
Steve Hvinden, BOR
Superintendent, Colorado River Agency

Part 417.3 Factors	2018 Reply	2019 Reply (Written)
Record of water orders[9]	Same (no foreseen problems)	Same (no foreseen problems)
Record of Rejections of Water Orders[10]	Same (no foreseen problems)	Same (no foreseen problems)
General Operating Practices/Policies[11]	No Change	No Change
Operating Efficiencies[12]	Studies of Project conveyance efficiency showed generally lower values for Upper Project (Main Canal and L73) than for the Lower Project (L90) attributed to higher spill and seepage losses in the Upper Project, although Upper Project values have higher uncertainty. The average conveyance efficiency for the Upper Project was 58% compared to 83% for the Lower Project.	Similar to 2018
Methods of Irrigation of the water users[13]	No change, minimal slope border flood	No change, minimal slope border flood
Amount and rate of return flow to the CO river[14]	2018 return data and 2015-2017 three year average 434 cfs	3 year average – from 2016 – 2018 = 405 cfs
Municipal Water Requirements[15]	10,000 ac-ft	10,000 ac-ft
Provisions of Users Water Delivery Contract[16]	N/A	N/A
Water Rates[17]	$54 per assessed acre $17 per acre foot of excess	$56.50 per assessed acre $18 per acre foot of excess
Number of Ditch Riders[18]	16 Ditch Riders Total 2 new in training—The	21 Ditch Riders

[9] Do the Tribes amend daily water orders with the USBR more than three times a month?
[10] Have water orders from farmers been rejected by the Tribe (e.g. for non-payment, etc.), which would impact their water order?
[11] Have there been any changes to operating practices or policies? If so, describe the new operating practice or attach a description of the new policy.
[12] Total water consumed divided by total water diverted in percent.
[13] Types of irrigation management practices employed (e.g. surge, cutback, etc.). Describe any changes to the type of management practice utilized and provide the quantity of acres affected by these changes.
[14] Amount (cfs) and average rate (ft/sec) of return flow to the river.
[15] The amount of water going to non-agricultural uses (municipal, industrial, feedlots, other, etc…) in acre feet.
[16] Have there been any changes in the water service contract?
[17] Have there been any changes in water rates? If so, submit the changed rates.
[18] Number of ditch riders and areas/divisions each ditch rider works.

Part 417.3 Factors	2018 Reply	2019 Reply (Written)
	actual number of ditch riders working on the Project is considerably fewer.	
Water Conservation[19]	$210,000	Similar to 2018
Other Relevant Factors[20]	All parties have agreed to exercise the second-year option of the System Conservation Implementation Agreement (SCIA) between CRIT and the USBR. The Tribes will fallow 1,591 acres of the area known as Kudu Farms from October 1, 2017 to September 30, 2018. CRIT will reduce diversions at Headgate Rock Dam by 2,041 AF for the period October 1, 2017 through December 31, 2017; and by 13,345 AF for the period January 1, 2018 through September 30, 2018. Total diversion reduction for the one-year period is 15,386 AF. A third-year option to fallow is possible under this agreement but presently not considered likely.	A second System Conservation Implementation Agreement (SCIA) between CRIT and the USBR has been executed. The Tribes will fallow 1,884 acres of the area known as MTA Farms from October 1, 2018 to September 30, 2019. CRIT will reduce diversions at Headgate Rock Dam by 2,651 AF for the period October 1, 2018 through December 31, 2018; and by 17,281 AF for the period January 1, 2019 through September 30, 2019. Total diversion reduction for the one-year period is 19,932 AF.

WATER CONSERVATION PLAN IMPLEMENTATION[21]

2018 Activity

1. CRIT Water Resources Dept. (WRD) is continuing to plan and implement SCADA improvements on the Project
2. NRCE collaborated with CRIT Water Resources Dept. and the CRIP Irrigation System manager to prepare the 2018 Update to the Project 5-year plan.
3. NRCE designed water measurement infrastructure for 5 Lateral/Sublateral headings and six spill sites on the Project.

[19] How much money will be spent by the Tribes on water conservation for 2019?
[20] Optional, please identify any other relevant factor/factors and explain why it would impact the water order.
[21] Water conservation activities/measures/practices the Tribes implemented in 2018.

4. NRCE worked with CRIT Farms and CRIT Water Resources to identify on-farm irrigation conservation projects and apply to the NRCS EQIP program for cost share funding. An approximately 600 ac parcel near Scott Rd and 17th Ave was proposedfor improved water delivery and on-farm field layout. NRCS did not approve the application.

OTHER[22]

CRIT has entered into a second SYSTEM CONSERVATION IMPLEMENTATION AGREEMENT (SCIA) with the US BUREAU OF RECLAMATION to implement a pilot system conservation program to create conserved water in Lake Mead. The Tribes will fallow 1,884 acres of the area known as MTA Farms from October 1, 2018 to September 30, 2019. CRIT will reduce diversions at Headgate Rock Dam by 2,651 AF for the period October 1, 2018 through December 31, 2018; and by 17,281 AF for the period January 1, 2019 through September 30, 2019. Total diversion reduction for the one-year period is 19,932 AF.

Signature **Date**

[22] Other relevant materials to submit (e.g. new water conservation plan, transfers, water price sheet, etc.).

Colorado River Indian Tribes

Diversion Estimates by Month

Total Pumped & Surface Water Diversions

2019 Diversion Estimates (ac-ft.)					
	California	Arizona			
Month	River Pumps	Headgate Rock Dam	Diversion Reduction*	CRIT Other Diversions	Total Diversion
JAN	187	15,962	639	414	15,737
FEB	225	36,592	991	479	36,080
MAR	307	59,485	1,414	469	58,540
APR	332	69,278	2,088	514	67,704
MAY	404	77,417	2,492	622	75,547
JUN	488	79,183	2,511	744	77,416
JUL	531	81,336	2,492	807	79,651
AUG	508	71,535	2,563	1,019	69,991
SEP	407	55,298	2,091	823	54,030
OCT	344	44,371		714	45,085
NOV	249	31,006		527	31,533
DEC	238	33,298		509	33,807
TOTAL	4,220	654,761	17,281	7,641	645,121
ENTITLEMENT	56,846				662,402

AGENCY		PROJECT				UNIT OF PROJECT			DATE		
Colorado River Indian Tribes		Conservation/Planning				CRIT Agricultural Report 2017			October 9, 2018		
1	2	3		4		5		6	7		8
A: CROPS IRRIGATED	UNIT	Farmed by CRIT Farms		Farmed by Others		TOTALS		Avg. Acre	Avg. Market Value Per		Total Market Value
		acres	yield	acres	yield	acres	yields	yield	unit	acre	
Alfalfa	TON	6966.55	58519.02	50930.45	427815.78	57897	486334.8	8.4	205	1722	$99,698,634.00
Cotton	LBS	2420.23	4322530.78	2793.795	4989717.87	5214.025	9312248.65	1786	.81	1446.6	$7,542,921.40
Wheat	BUSH	---	---	314	31714	314	31714	101	8.24	832.24	$261,323.36
Bermuda	TON	54.1	243.45	1761.6	7927.2	1815.7	8170.65	4.5	185	832.5	$1,511,570.25
Onions	TON	428	187892	305.2	133982.8	733.2	321874.8	439	8	3512	$2,574,998.40
Garlic	CWT	---	---	1336.95	223939.12	1336.95	223939.12	167.5	67.40	11289.5	$15,093,496.68
Corn	CWT	---	---	386.35	73406.50	386.35	73406.50	190	5.25	997.5	$385,384.12
Lettuce	LBS	100	910000	---	---	100	910000	9100	1.01	9191	$919,100.00
Sudan	TON	1365.64	4643.176	---	---	1365.64	4643.176	3.4	130	442	$603,612.88
Idle/Fallow	---	1976.58	---	5530.62	---	7507.2	---	---	---	---	---
CRIT Air	---	703.2	---	---	---	703.2	---	---	---	---	---
Preserve	---	235.1	---	---	---	235.1	---	---	---	---	---
Running Man	---	5	---	---	---	5	---	---	---	---	---
B: Irrigated Crops		11334.52	---	57828.34	---	69,162.86	---				
C: Total Irrigated		11334.52	---	57828.34	---	---	---				
D: Double Cropped		8386.29	---	52692.05	---	---	---				
E: Net Area Irrigated		11334.52	---	57828.34	---	---	---				
F: Idle/Not Irrigated		2919.88	---	5530.62	---	---	---				
G: Total Acres		14254.4	---	63358.96	---	---	---				

TOTAL OF ALL CROP MARKET VALUE	$128,591,041.09

1: List types of crops irrigated: Include irrigated pastured lands.
3: CRIT Farms..
4, Non-Indian owned: Include area irrigated and farmed by schools, agencies, missions and trades.

Lands farmed by:	Acres	CROP VALUE	PER ACRE VALUE
H: CRIT Farms.	11334.52	$18,568,536.16	$1,638.22
I: All Irrigated Acres.	69,162.86	---	---
J: Non- Indian Farmers.	57828.34	$110,022,504.93	$1,736.49
K: Total Idle/Fallow Acres.	8450.5	---	---
L: Total of Farmed/Idle.	77613.30	$128,591,041.09	$1,656.81

CASCADE ECONOMICS LLC
2800 SE 370TH AVENUE
WASHOUGAL, WA 98671
(360) 835-7340

MEMORANDUM

TO: ANGIE INGRAM, WATER RESOURCES ACTING DIRECTOR, COLORADO RIVER INDIAN TRIBES

FROM: MICHAEL TAYLOR

CC: TOM LEY, NATURAL RESOURCES CONSULTING ENGINEERS

SUBJECT: PRICES AND YIELDS FOR YEAR 2018 RECLAMATION PART 417 REPORT

DATE: 10 OCTOBER 2018

PURPOSE

This memorandum provides a brief overview of prices and yields for crops grown in the Colorado River Irrigation Project (CRIP) to be included in the Part 417 Report to the Bureau of Reclamation. Supporting data are included in a separate spreadsheet. For each crop, an "average market value price" is presented in **bold**; this should be included in the Part 417 Report to reflect the value of the calendar year's production. Yields to be included in the report are also presented in **bold**.

ALFALFA

Historic and Current Prices

Alfalfa prices have been fairly volatile historically, ranging from a low of $130 to more than $260 per ton at times during the past ten years. During the marketing year (April through March), prices tend to be at their lowest in the autumn when hay stocks are at their peak; the price usually rebounds in December or January. The most recent data (August 2018) indicates a price of $220 per ton, which is the highest price in five years.

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MARKETING YEAR*
2013	$200	$200	$220	$200	$240	$220	$200	$190	$180	$185	$170	$190	$201
2014	$200	$205	$215	$225	$240	$240	$240	$240	$195	$180	$180	$200	$218
2015	$215	$208	$200	$200	$200	$160	$150	$140	$130	$135	$140	$140	$157
2016	$160	$150	$180	$180	$155	$140	$140	$140	$140	$140	$145	$150	$151
2017	$150	$165	$170	$170	$170	$180	$170	$165	$160	$160	$170	$170	$174
2018	$180	$190	$200	$210	$210	$220	$220	$220					

* Average price for the marketing year of April through March

The marketing year price for 2017 was reported as $174 per ton. The partial marketing year average value (April through August) is $216 per ton, but for the 2018 calendar year (through August) the average is $206. For purposes of the Part 417 Report, a price of **$210 per ton** is recommended to represent the calendar year production value.

Yield

Historic alfalfa yields for La Paz county range from 8.15 to 8.75 tons per acre for 2013 through 2017. The average yield for the period is **8.20 tons per acre,** the value to use in the Part 417 report.

Projected Cropping Share

Estimating future prices is difficult even under the best of circumstances. The best available information for making a projection is to rely on recent prices in both Arizona and California, the latter because of its large influence on alfalfa markets in the region. California prices tend to be higher than Arizona because hay producers are closer to Central Valley and Southern California dairy farms, major buyers of alfalfa. Past downward price trends in recent years in California have mirrored those in Arizona; however, overall supplies in the region are beginning to match demand, and prices have since rebounded considerably.

Growers will shift production to other crops if there is sufficient price incentive to do so. The primary large-volume alternatives to alfalfa are upland cotton and durum wheat; as indicated below, neither commodity has experienced a price increase that would suggest a significant change in the rotation away from alfalfa. It is more likely that growers that are in the middle of their production rotation will continue to grow alfalfa. Current estimates of the cropping share of alfalfa among crops in the CRIP is approximately 93 percent; the crop share is not likely to fall below 85 percent in the next year.

COTTON

Historic and Current Prices

Cotton (upland variety) is a common cropping alternative to alfalfa in the Project. Marketing year price the last six years declined from $0.876 to $0.632 per pound, before rising to $0.690 in 2016 (the latest year with records). Cottonseed prices for 2018 are somewhat lower than the last two years. For purposes of the Part 417 Report, a price of **$0.69 per lb.** is recommended to represent the production value.

2011	2012	2013	2014	2015	2016
$0.876	$0.768	$0.780	$0.641	$0.632	$0.690

Yield

Historic yields for La Paz county range from 1,611 to 1,937 lbs. per acre for 2011 through 2017. The average yield for the period is **1,781 lbs. per acre,** the yield to use in the Part 417 report.

County	2011	2012	2013	2014	2015	2016	2017
LAPAZ	1,937	1,696	1,611	1,898	1,886	1,760	1,680

WHEAT

Historic and Current Prices

Durum wheat is often grown in rotation in the Project with cotton and alfalfa, or as a "rest" crop used to replenish the soil. Price data for durum wheat grown in Arizona are published for the marketing year; the most recent price from 2017 is $7.06 per bushel. This is a decline from recent years, when prices were more than $8 per bushel, but higher than last year. For purposes of the Part 417 Report, a price of **$7.06 per bu.** is recommended to represent the production value.

$/bu.	2012	2013	2014	2015	2016	2017
Annual	$9.49	$8.74	$8.36	$9.14	$6.70	$7.06

Yield

Historic yields for Arizona range from 97.8 to 111 bu. per acre for 2013 through 2018, with 2018 yields at 102.4 bu. per acre. No details are available for La Paz County, so the statewide yield of **102 bu. per acre** should be used in the Part 417 Report.

bu/Ac	2013	2014	2015	2016	2017	2018
AZ	102	111	101	97.8	100.8	102.4

OTHER CROPS

Bermuda Grass for Hay

Bermuda grass hay is a specialty feed that falls within the statistical category of "Other Hay," which excludes alfalfa. The price has been comparable to alfalfa for much of the past several years, but fell to $160 per ton during 2016. The price has since recovered considerably, as did alfalfa. The average price for the 2018 calendar year (January through August) is $198, which should be rounded to **$200 per ton** for the Part 417 Report.

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MARKETING YEAR
2013	$210	$210	$200	$190	$250	$190	$190	$210	$200	$190	$180	$190	$201
2014	$200	$205	$210	$220	$230	$230	$205	$205	$220	$220	$220	$220	$214
2015	$210	$195	$165	$200	$200	$175	$165	$180	$170	$170	$200	$200	$188
2016	$200	$200	$195	$160	$160	$160	$160	$160	$160	$160	$160	$155	$159
2017	$155	$155	$160	$160	$160	$170	$180	$175	$170	$180	$180	$180	$173
2018	$190	$190	$200	$200	$200	$200	$200	$200					$200

The average yield for 2013 to 2018, which should be used in the Part 417 Report, is approximately **4.6 tons per acre**.

Corn

The most recent price data is **$4.35 per bu.** Average yield for 2011 to 2017 is 197.1 bu. per acre, but in 2014 through 2017 was **207 bu. per acre**, which is the yield which should be used in the Part 417 Report.

Garlic

Garlic production is not tracked in Arizona, as there are too few growers. The most recent price data is available from California is **$76.30 per hundredweight (cwt).** Average yield for 2011 to 2017 (latest available period) is **162.9 cwt. per acre**, which should be used in the Part 417 Report.

Onions

Since 2010, onion production has not been tracked in Arizona. The most recent price data for spring onions is available from California, where the average for 2015 (there is no estimate available for 2016 or 2017) was **$17.70 per cwt**, which should be applied to the Part 417 Report. Yield data are also available from California, and the average for 2013 through 2018 yield was 441 cwt per acre, which can be rounded to **440 cwt. per acre** for use in the Part 417 Report.

cwt/acre	2013	2014	2015	2016	2017	2018
CALIFORNIA	400	440	450	435	470	450

Potatoes

There is only a small amount of potato production in Arizona. The most recent price data for spring potatoes is available from California, with an average for 2016 of **$18.90 per cwt**, the amount to be used for the Part 417 Report. Yield data are available for Arizona up through 2015, but is not available for 2016 or 2017. The 2015 yield was **290 cwt. per acre**, which should be used in the Part 417 Report.