Hendrix Wai Engineering, Inc.

Water Resources, Water Rights and GIS/Computer Modeling

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February 26, 2025

Melissa van der Poel, Team Leader, Division 2
Colorado Division of Water Resources
1313 Sherman Street, Suite 821
Denver, Colorado 80203

Subject: Brannan Sand and Gravel's ("Brannan's) West Farm Pit Substitute Water Supply Plan, DRMS-M-2008-078, Sections 33 & 28, T22S, R46W, 6th P.M., Division 2, Water District 67, SWSP ID No. 5121, WDID 6707869 Renewal Request

Dear Ms. van der Poel:

Pursuant to C.R.S. § 37-90-137(11), Brannan requests renewal of the West Farm Pit Substitute Water Supply Plan (DRMS-M-2008-78) to continue mining of aggregate at a site located in parts of the S ½ of the SE ¼ of Section 28 and the NE ¼ and the NW ¼ of Section 33, Township 22 South, Range 46 West, in the 6th P.M., Prowers County, Colorado on land called the West Farm. The mining site is located approximately ½ mile east of the City of Lamar. **Figure 1** shows the location of the gravel mine site. Payment of $257.00 for the filing fee for the DRMS-M-2008-78 renewal request will be paid upon invoice of receipt. The most recent approval of this plan was May 24, 2024 for the period of May 1, 2024 through April 30, 2025. All depletions from the mining operations including evaporative losses from the dewatering trench, settling pond, moisture content, dust control and product washing have been fully replaced within Lower Arkansas Water Management Association's (LAWMA's) augmentation plan originally decreed in Water Court Case No. 02CW181. This request clarifies what depletions are augmented by which plan. The evaporative losses from the dewatering trench, settling pond and moisture content will be augmented under this plan while dust control and aggregate washing will be augmented within LAWMA's augmentation plan. Approval of this plan is sought for the period of May 1, 2025 through April 30, 2026.

Project Description

Evaporative Losses associated with Mining at the Pit

Brannan operates a dry-mining gravel pit. Dry mining involves the installation of an impermeable layer that prevents groundwater from entering the mining pit. The former operator, GP Aggregates, followed the State Engineer's Lining Criteria and received approval of the liner for the West Farm Pit from the Division Engineer's Office; Brannan has no intention of removing the impermeable layer. Dewatering trenches are installed and used throughout the mining site. The maximum length of the dewatering trenches will occur when the second phase of mining is completed and before any reclamation has begun.

Process water from the mine is collected in a settling pond. This settling pond surface area measures 9.25 acres for the first three months after which the ponds on cell 8 will no longer have water, reducing the surface area to 7.06 acres. The maximum exposed surface area from the settling pond on the mining site is expected to be 7.06 acres and that is the surface area we have used to calculate evaporative losses for this plan.

Table 1 shows the monthly evaporation from the exposed 9.25 acres in the first three months and 7.06 acres for the remaining months within this plan request. The values for **Table 1** were obtained from paragraph A.i of Exhibit R of the LAWMA decree in Case No. 02CW181. The total annual evaporation from groundwater exposed from surface area above is estimated to be 32.67 acre-feet. This amount is shown in **Table 1** and will be augmented under DRMS-M-2008-78.

A well permit (Permit No. 75864-F) has been issued for the uses at the mining site for dewatering and exposed pond surface area in accordance with C.R.S. § 37-90-137(2).

Water Losses in the Mined Material

As part of the operation of the mining of the gravel pit, water is retained in the mined material that is removed from the gravel pit site. The total projected amount of material to be mined from the gravel pit during the proposed term of this plan is anticipated to be approximately 1,400,000 tons. That estimate is based upon information provided by Brannan. Material mined from the gravel pit has a 2% moisture content since the gravel pit is lined with no groundwater flowing into the pit. Therefore, the total amount of water that will be consumed in the removal of the aggregate from the mining site under this plan is estimated to be 20.6 acre-feet of water ({1,400,000 tons x 2,000 pounds per ton x 2% / 62.4 pounds per ft^3} / 43,560 ft^2 per acre).

Aggregate Washing and Dust Control

Groundwater from well SEO Id No. 6705373 is used to wash the aggregate and for dust control at the West Farm Pit site. Depletions from the pumping of this well, as measured through the “B” meter, are augmented at 100% in LAWMA’s augmentation plan. This well was added to LAWMA’s augmentation plan in Case No. 12CW37. Please see Exhibit B of Case No. 12CW37. Accordingly, the use of water pumped by the well and used at the West Farm Pit will continue to be augmented under LAWMA’s augmentation plan and not under this plan.

Total Consumptive Use

The total amount of groundwater consumptive use from operation of the West Farm Pit during the proposed term of this plan will be 53.28 acre-feet (32.67 acre-feet of evaporation + 20.60 acre-feet of moisture content removal). This amount is shown in **Table 2**.

Mining Stream Depletions

Depletions to the Arkansas River from the mining of aggregate from the gravel pit are lagged since the centroid of the mining site is approximately 3,300 feet from the river. Lagged stream depletions were determined using the Integrated Decision Support Group's (IDS) Alluvial Water Accounting System (AWAS) model, version 1.5.85. A stream depletion factor (SDF) of 88 days[1] was used to lag the stream depletions. The SDF of 88 days was used in the prior approval of DRMS-M-2008-78 and is maintained in this request. Previous mining operations have been included in the modeling and the results with the projected mining under this plan are shown in **Table 3**. The total stream depletion that will occur during this plan year will be 44.01 acre-feet.

Replacement Water

Brannan currently owns 400 LAWMA common shares (see attached LAWMA share certificate Nos. 888 and 890). The proposed allocation for a LAWMA common share in 2025 is yet to be set; however, current projections are 80% to a LAWMA Common Share for 2025 therefore a 80% allocation will be used. Therefore, Brannan must dedicate at least 56 of their owned 400 LAWMA common shares for augmentation of the lagged stream depletions under this plan (44.01 acre-feet of stream depletions / 0.80). In the event of a lower allocation additional shares up to 400 LAWMA common shares will be used to replace depletions under this SWSP.

There is a limited amount of aggregate that can be mined from the existing site. As such, each year LAWMA will re-evaluate Brannan's need for LAWMA shares to ensure that Brannan has dedicated the proper amount to any requested renewal of the plan.

Table 3 shows the proposed replacement schedule of the stream depletions in this plan. LAWMA has been fully augmenting the entire operation of the West Farm Pit (i.e., evaporative losses from the dewatering trench and settling pond, water lost as moisture content in the aggregate and water pumped from the well for gravel washing and dust suppression) within its augmentation plan up to the 2018 plan year. Beginning in 2018 only the well pumping from well SEO Id No. 6705373, that is used for aggregate washing and dust suppression, has been augmented in LAWMA's augmentation plan. All other mining activities have been augmented under a SWSP as of 2018. Moving forward, ongoing lagged stream depletions from past operations of the West Farm Pit and future depletions from use of the well for aggregate washing and dust suppression will continue to be augmented under LAWMA's augmentation plan. Evaporative depletions from the dewatering

[1] Interpolated from "Stream Depletion Factors, Arkansas River Valley, Southeastern Colorado" by C.T, Jenkins and O. James Taylor (USGS OFR 72-192).

trench and settling pond and water lost as moisture content in the mined aggregate will be replaced under this plan and future plans pursuant to C.R.S. § 37-90-137(11).

LAWMA has the following decreed replacement sources that can be utilized for replacement of the stream depletions associated with this plan:

Replacement Source	Amount	Water Division 2 Case No.
Highland Irrigation Company	3,402 of 3,800 shares	02CW181
Highland Canal Direct Flow	169 of 3,800 shares	10CW085
Fort Lyon Canal Direct Flow	7,487 of 93,989.4166 shares	19CW3036
Keesee Ditch	14.25 cfs of 28.5 cfs	02CW181
Keesee Ditch	14.25 cfs of 28.5 cfs	05CW052
Keesee Ditch Article II Account	Half of Account	02CW181
Keesee Ditch Article II Account	Half of Account	05CW052
Fort Bent Ditch Company	1,104 of 11,651.2 shares	02CW181
Fort Bent Ditch Company	144 of 11,651.2 shares	10CW085
Lamar Canal Company	50 of 26,127 shares	02CW181
Lamar Canal Company (Colorado Parks and Wildlife)	15 percent of 4,720 shares	02CW181
Lamar Canal Company (Colorado Beef)	3,477 of 26,127 shares	02CW181
Lamar Canal Company	3,522.5 of 26,127 shares	15CW3067
Manvel Canal	54 cfs	02CW181
Manvel Canal Article II Account	Entire Account	02CW181
X-Y Irrigating Ditch	67 cfs of 69 cfs	02CW181
X-Y Irrigating Ditch	2 cfs of 69 cfs	15CW3067
X-Y/Graham Article II Account	Entire Account	02CW181
Stubbs Ditch	7.2 cfs	02CW181
Stubbs Ditch Article II Account	Entire Account	02CW181
Sisson Ditch	18 cfs	10CW085
Sisson Ditch Article II Account	Entire Account	10CW085
John Martin Reservoir Offset Account Transit Loss	Varies	
10-Year Credit Deliveries to the Stateline (Stateline Credit)	Varies	

Accounting

Table 4 is the proposed monthly accounting form that will be used in this plan. This accounting form is consistent with the previous accounting form which separates the amount of the replacement obligation under this plan and from the amount of the replacement obligation under LAWMA's augmentation plan. The amount of aggregate mined and the meter reading for the dust control / aggregate washing will be completed by a representative of Brannan. This person is currently Jason Markle whom sends this information to Dan Richards. Dan Richards will then provide the accounting form electronically to Randy Hendrix or Ayrton Hendrix of Hendrix Wai Engineering, Inc. to lag the stream depletions for the operational uses in this plan and for the well pumping augmented in LAWMA's augmentation plan. Mr. Hendrix will then include the accounting within his monthly submittal of substitute water supply plans to the Division 2 Engineer's Office, the District 67 Water Commissioner and Ms. Bethany Arnold, the Assistant Division Engineer – Division 2. A sample of the daily accounting to be used is attached to this request.

Proposed Term

This renewal request seeks approval for one year beginning May 1, 2025 and ending April 30, 2026.

Reclamation of Mining Site

After mining and reclamation has been completed, a lined reservoir(s) will be created with a total surface area of approximately 183 acres. Mining has been completed in the first cell and that structure is currently included in LAWMA's decree in Case No. 15CW3067. The new approximately 183-acre cell would also be included as a place to store water within LAWMA's augmentation plan but LAWMA may or may not purchase the new cell. Brannan has a corporate surety bond for the mining site allowing the site to be bonded for lining or backfilling the pit in the event that Brannan ceases mining operations and abandons the site completely.

Summary

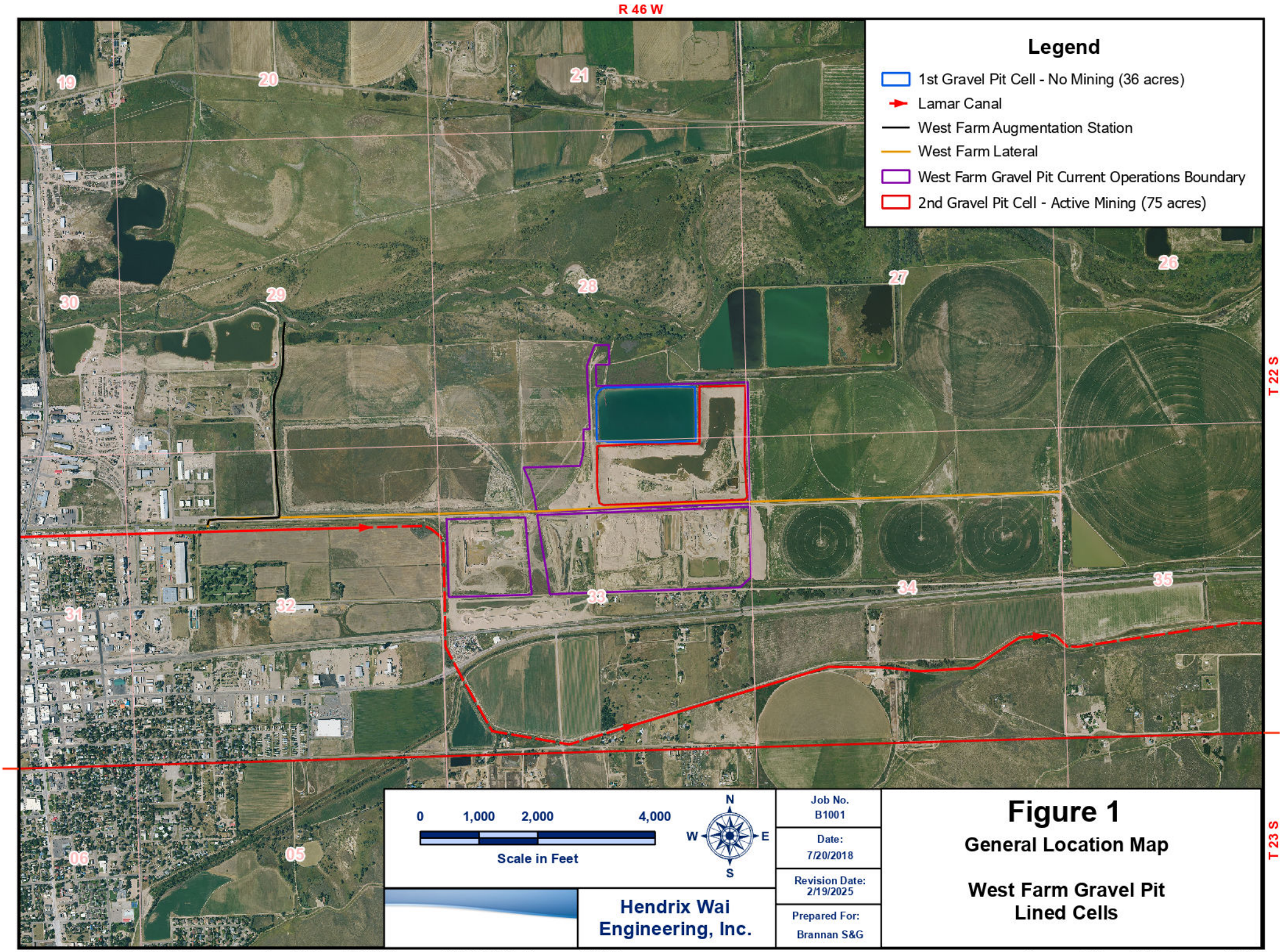
Brannan will dry-mine a gravel pit on the West Farm located about ½ mile east of the Town of Lamar. Depletions from a dewatering trench, settling pond and moisture content within the aggregate will be augmented under this plan. The depletions will be lagged back to the Arkansas River using the AWAS program and a SDF of 88 days. It is estimated that a total of 44.01 acre-feet of stream depletions will need to be augmented by this plan in 2025 using Brannan's LAWMA shares. The depletions will be separated from the well pumping at the site for aggregate washing and dust control that is augmented under LAWMA's augmentation plan.

Please contact Randy Hendrix at randy@hendrix-wai.com, Ayrton Hendrix at ayrton@hendrix-wai.com by e-mail or at (720) 930-4360 with questions regarding the accounting and operation of this plan.

Hendrix Wai Engineering Inc.

Ayrton M. Hendrix, P.E.

Cc: Rachel Zancanella, Colorado Division of Water Resources – Division 2
Bethany Arnold, Colorado Division of Water Resources – Division 2
Todd Yee, J&T Consulting, Inc.
Steve Kelton, Brannan Sand & Gravel
Roy Cue, Lower Arkansas Water Management Association



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Document Name: 2025_Brannan_SWSP

Table 1
Evaporative Consumptive Use

Month	Gross Exposed Water Surface	Net Water Surface Evaporation	Total Evaporative Consumptive Use
	(ac)	(af / ac)	(ac-ft)
(1)	(2)	(3)	(4)
May	9.25	0.46	4.26
June	9.25	0.59	5.46
July	9.25	0.62	5.74
August	7.06	0.55	3.88
September	7.06	0.43	3.04
October	7.06	0.30	2.12
November	7.06	0.17	1.20
December	7.06	0.13	0.92
January	7.06	0.12	0.85
February	7.06	0.15	1.06
March	7.06	0.22	1.55
April	7.06	0.37	2.61
	7.61	4.11	32.67

Column Explanation:

1) Month of the year
2) Exposed surface water area from dewatering trench, settling pond, and freshwater ponds.
3) Month net evaporation rates from paragraph A.i of Exhibit R of LAWMA Case No. 02CW181 decree.
4) Column 2 x Column 3

Table 2
Total Operational Consumptive Use

Month	Percent of Annual Aggregate Production	Aggregate Production	Water Retained in Product	Total Evaporative Consumptive Use	Total Consumptive Use
	(ac)	(tons)	(ac-ft)	(ac-ft)	(ac-ft)
(1)	(2)	(3)	(4)	(5)	(6)
May	13.0%	126,000	1.85	4.26	6.11
June	16.0%	147,000	2.16	5.46	7.62
July	17.0%	147,000	2.16	5.74	7.90
August	15.0%	147,000	2.16	3.88	6.05
September	9.0%	147,000	2.16	3.04	5.20
October	7.0%	112,000	1.65	2.12	3.77
November	4.0%	91,000	1.34	1.20	2.54
December	1.0%	84,000	1.24	0.92	2.15
January	1.0%	84,000	1.24	0.85	2.08
February	2.0%	84,000	1.24	1.06	2.30
March	6.0%	105,000	1.55	1.55	3.10
April	9.0%	126,000	1.85	2.61	4.47
	100.0%	1,400,000	20.60	32.67	53.28

Column Explanation:

1) Month of the year
2) Estimated percentage of the annual production during the month.
3) Calculated as 1,350,000 x Column 2
4) Calculated as {(Column 3 x 2,000 x 0.02) / 62.4 / 43,560}
5) Monthly values from Table 1 Column 4
6) Sum of Column 4 and Column 5

Note:

Since mining operation is considered dry-mining with an impermeable layer moisture content in mined aggregate is considered at 2%.

Table 3
Total Operational Consumptive Use with Lagged Stream Depletions

Month	Percent of Annual Aggregate Production	Aggregate Production	Water Retained in Product	Total Evaporative Consumptive Use	Total Consumptive Use	Lagged Stream Depletion
	(ac)	(tons)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
May	13.0%	126,000	1.85	4.26	6.11	3.16
June	16.0%	147,000	2.16	5.46	7.62	3.89
July	17.0%	147,000	2.16	5.74	7.90	4.60
August	15.0%	147,000	2.16	3.88	6.05	4.89
September	9.0%	147,000	2.16	3.04	5.20	4.68
October	7.0%	112,000	1.65	2.12	3.77	4.34
November	4.0%	91,000	1.34	1.20	2.54	3.82
December	1.0%	84,000	1.24	0.92	2.15	3.30
January	1.0%	84,000	1.24	0.85	2.08	2.94
February	2.0%	84,000	1.24	1.06	2.30	2.73
March	6.0%	105,000	1.55	1.55	3.10	2.71
April	9.0%	126,000	1.85	2.61	4.47	2.95
	100.0%	1,400,000	20.60	32.67	53.28	44.01

Column Explanation:

1) Month of the year
2) Estimated percentage of the annual production during the month.
3) Calculated as 1,350,000 x Column 2
4) Calculated as {(Column 3 x 2,000 x 0.02) / 62.4 / 43,560}
5) Monthly values from Table 1 Column 4
6) Sum of Column 4 and Column 5
7) Lagged stream depletionf from monthly values in Column 6 using AWAS and a SDF of 88 days

Note:

Since mining operation is considered dry-mining with an impermeable layer moisture content in mined aggregate is considered at 2%.

Table 4

Accounting Form

Brannan Sand & Gravel West Farm Pit

2025

	{A}	{B}	{C}	{D}	{E}	{F}	{G}	{H}	{I}	{J}	{K}	{L}
Month	**Input** Aggregate Production	Water Retained in Product	**INPUT** Meter Reading 6705373-B	Water Used for Washing & Dust Control	**Input** Exposed Surface Area	Evaporation Rate	Evaporative Consumptive Use	**SWSP** Total Consumptive Use	**SWSP** Total Lagged Consumptive Use	**LAWMA Aug Plan** Total Consumptive Use	**LAWMA Aug Plan** Total Lagged Consumptive Use	Total Replacement from LAWMA
	(tons)	(ac-ft)		(ac-ft)	(acres)	(ac-ft/ac)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)
May-25					9.25	0.46	4.26					0.00
Jun-25					9.25	0.59	5.46					0.00
Jul-25					9.25	0.62	5.74					0.00
Aug-25					7.06	0.55	3.88					0.00
Sep-25					7.06	0.43	3.04					0.00
Oct-25					7.06	0.30	2.12					0.00
Nov-25					7.06	0.17	1.20					0.00
Dec-25					7.06	0.13	0.92					0.00
Jan-26					7.06	0.12	0.85					0.00
Feb-26					7.06	0.15	1.06					0.00
Mar-26					7.06	0.22	1.55					0.00
Apr-26					7.06	0.37	2.61					0.00
May-26					7.06	0.46	3.25					0.00
Total	-	0.00		0.00		4.11	32.67	0.00	0.00	0.00	0.00	0.00

Notes:

{A} **Input** aggregate sales or production in tons.
{B} Water retained in product based on moisture content factor of 2% by weight
{C} **Input** Meter reading for the meter SEO ID 6705373-B. Used as part of the gravel pit operation 100% consumptive.
{D} The total amount used for dust control on site (calculated as Column C minus previous Column C x 0.001 multiplier)
{E} **Input** current exposed water surface area
{F} Net water surface evaporation
{G} Column F x Column G
{H} Sum of Column B and Column G
{I} Column H lagged Consumptive Use using AWAS 1.5.85 with the SDF value of 88 by Hendrix Wai Engineering, Inc.
{J} Value in Column D
{K} Column J lagged Consumptive Use using AWAS 1.5.85 with the SDF value of 88 by Hendrix Wai Engineering, Inc.
{K} Amount of replacement water delivered by LAWMA's augmentation sources.

Send Monthly Copies to:

Rachel Zancanella
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310 E Abriendo
Pueblo, CO 81004

Brandy Cole
Water Commissioner
District 67

Don Higbee
LAWMA
P. O. Box 1161
Lamar, CO 81052

LITHO. IN U.S.A. No. 720

CERTIFICATE

No. 890

For 200 Shares

Issued to

Brannan Sand and Gravel Company, LLC

Dated November 16, 2021 ,20

FROM WHOM TRANSFERRED

GP Aggregates & NBH Bank

Dated ,20

No. Original Certificate	No. Original Shares	No. of Shares Transferred
778	100	100
779	100	100

Received Certificate No. 890

For ~ 200 — Shares

this day of ,20

Transferred from certificates # 778 and 779

NUMBER 890

SHARES 200

LOWER ARKANSAS WATER MANAGEMENT ASSOCIATION

BOX 1161
LAMAR, COLORADO 81052

This Certifies that Brannan Sand and Gravel Company, LLC is the registered holder of Two hundred** Shares

transferable only on the books of the Corporation by the holder hereof in person or by Attorney upon surrender of this Certificate properly endorsed.

In Witness Whereof, the said Corporation has caused this Certificate to be signed by its duly authorized officers and its Corporate Seal to be hereunto affixed this Sixteenth day of November A.D. 2021

[signature] [signature]

Transferred from certificate # 845

CERTIFICATE

No 888

For 200 Shares

Issued to

Brannan Sand and Gravel Company, LLC

Dated December 15, 2021 ,20

FROM WHOM TRANSFERRED

ARF & Rabo

Dated ,20

No. Original Certificate	No. Original Shares	No. of Shares Transferred
845	430	200

Received Certificate No. 888

For 200 Shares

this day of ,20

LITHO. IN U.S.A. No. 720

NUMBER 888 SHARES 200

LOWER ARKANSAS WATER MANAGEMENT ASSOCIATION

BOX 1161
LAMAR, COLORADO 81052

This Certifies that Brannan Sand and Gravel Company, LLC is the registered holder of Two hundred********** Shares

transferable only on the books of the Corporation by the holder hereof in person or by Attorney upon surrender of this Certificate properly endorsed.

In Witness Whereof, the said Corporation has caused this Certificate to be signed by its duly authorized officers and its Corporate Seal to be hereunto affixed this Fifteenth day of December A. D. 2021

Transferred from certificate # 845

CERTIFICATE

No 889

For 230 Shares

Issued to

Arkansas River Farms, LLC, a Colorado limited liability company, Equity Owner; Rabo AgriFinance, LLC, a Delaware limited liability company, First Mortgagee

Dated December 15, 2021 ,20

FROM WHOM TRANSFERRED

ARF & Rabo

Dated ,20

NO. ORIGINAL CERTIFICATE	NO. ORIGINAL SHARES	NO. OF SHARES TRANSFERRED
845	430	230

Received CERTIFICATE NO. 889

For 230 Shares

this day of ,20

LITHO. IN U.S.A. No. 720

NUMBER 889

SHARES 230

LOWER ARKANSAS WATER MANAGEMENT ASSOCIATION

BOX 1161
LAMAR, COLORADO 81052

This Certifies that Arkansas River Farms, LLC, a Colorado limited liability company, Equity Owner; Rabo AgriFinance, LLC, a Delaware limited liability company, First Mortgagee is the registered holder of Two hundred thirty********** Shares

transferable only on the books of the Corporation by the holder hereof in person or by Attorney upon surrender of this Certificate properly endorsed.

In Witness Whereof, the said Corporation has caused this Certificate to be signed by its duly authorized officers and its Corporate Seal to be hereunto affixed this Fifteenth day of December A. D. 20 21

Donald F Higbee