COLORADO
Division of Water Resources
Department of Natural Resources

October 22, 2019

Jennifer S. Lindahl, P.E.
Bishop-Brogden Associates, Inc.
333 W. Hampden Avenue, Suite 1050
Englewood, CO 80110

Re: Larimer Pits Substitute Water Supply Plan (Plan ID 2915; WDID 0402525)
Amendment
DRMS File No. M-1974-069 (WDID 0403005)
Sections 15, 16, 17, T5N, R69W, 6th P.M.
Water Division 1, Water District 4, Larimer County

Approval Period: October 22, 2019 through July 31, 2021
Contact information for Ms. Lindahl: 303-806-8952; jlindahl@bbawater.com

Dear Ms. Lindahl:

We have reviewed your letter dated August 27, 2019, requesting an amendment to the approval of the above referenced substitute water supply plan ("SWSP") in accordance with § 37-90-137(11), C.R.S., to replace depletions at the Larimer Pits sand and gravel mining operation, operated by Loveland Ready-Mix Concrete Inc. ("LRM" or "Applicant"). The previous SWSP approval, dated August 5, 2019, is limited to covering the lagged depletions from the cessation of dewatering at Pit 20 and the associated "first fill" of Pit 20. The purpose of this amendment is to add additional depletions associated with the commencement of mining operations at Pit 21. The required filing fee of $257.00 has been submitted (receipt no. 3692899). **This SWSP Amendment supersedes the SWSP approval issued on August 5, 2019 in its entirety.**

SWSP Operation

LRM's Larimer Pits site is located in portions of Section 15, 16, and 17, T5N, R69W, 6th P.M., Larimer County, as shown in the attached Figure 1. The original site consisted of 20 gravel pits, five of which were completed prior to 1981, seven that are augmented under Case No. W-7412, four that have been backfilled, two that have been lined and decreed for storage, and five unlined pits that are partially augmented under Case No. 00CW142. The augmentation plan decreed in Case No. 00CW142 is limited to replacing depletions associated with evaporation from exposed surface areas and mining uses at Pit Nos. 13, 14, 15, 18 and 20. Pit 21 was added to the reclamation plan in Amendment AM03 and is not included as an augmented structure in Case No. 00CW142. During August of 2019, LRM discontinued dewatering at the unlined Pit No. 20, which is resulting in depletions due to lagged dewatering depletions no longer being offset by the water returned to the stream system,

and from the "first fill" of the pit. LRM plans to begin mining operations in Pit 21 during this plan period. LRM will dewater Pit 21 by pumping the water into Pit 20 to initially reduce the volume of groundwater that must be replaced due to the "first fill" and later to accrete back to the stream system. Mining at Pit 21 will consume water by three additional processes: water carried away in washed aggregate, concrete production, and dust control. Replacement water will be provided by the water stored in the lined Loveland Ready-Mix Ponds 1 and 2 ("LRM Ponds 1 and 2").

Depletions

Depletions resulting from evaporation and on-going production at Pit Nos. 13, 14, 15, 18 and 20 of the Larimer Pits site will continue to be replaced by the augmentation plan decreed in Case No. 00CW142. The August 5, 2019 SWSP approval covers additional depletions that result from the discontinuation of the dewatering at Pit No. 20 and from the "first fill" of Pit 20 through groundwater infiltration or delivery of out-of-priority surface water diversions. This amendment proposes to include additional depletions that result from the dewatering at Pit No. 21 and from water consumed in mining operations at Pit 21.

The discontinuation of dewatering at Pit No. 20 is resulting in lagged depletions to the stream, as water is no longer delivered to the Big Thompson River at a constant rate. LRM estimates that the pit had been dewatered at an average rate of approximately 100 gpm, or approximately 13.3 acre-feet per month.

The "first fill" is the water that fills an unlined pit or pond and occupies the volume previously occupied by the removed sand, gravel, or other solid material. For the purposes of this SWSP, you have proposed to calculate the "first fill" volume as the total volume of the pit. LRM estimates that Pit No. 20 has a surface area of 7 acres and a depth of 24 feet. This results in a maximum capacity of 168 acre-feet (the actual volume will likely be less as this calculation assumes that the side slopes are vertical). LRM plans to allow Pit No. 20 willto gradually fill by infiltration of groundwater once the dewatering pump is removed. At an estimated initial infiltration rate of 100 gpm, the lagged depletions from the first fill of the pit are anticipated to last approximately 21 months if no free river, surface water deliveries, or deliveries from Pit 21 are utilized.

Dewatering of Pit 21 during mining will be required due to saturated conditions at the proposed pit location. The water will be pumped from the proposed pit into LRM's unlined Pit 20 where it will fill Pit 20 before it accretes back to the stream system. Instantaneous dewatering rates as high as 300 gpm are possible at Pit 21, but average dewatering rates are expected to be closer to 100 gpm based on dewatering pump operations at other nearby pits, including Pit 20. Pumping rates are expected to be higher initially and decrease as dewatering progresses. LRM used the IDS Alluvial Water Accounting System (AWAS) to determine the lagged stream depletions and the timing of the river accretions resulting from deliveries into Pit 20. The Applicant may not claim recharge accretions for water discharged from Pit 21 to Pit 20 until the Applicant has first shown that 168 acre-feet of water have either infiltrated into or been delivered to Pit 20 to account for the "first fill". Due to the close proximity of the two pits, the timing of the dewatering depletions at Pit 21 and the return flow accretions from Pit 20 are fairly similar. If LRM is unable to pump water from LRM Ponds 1 and 2 at a sufficient rate to meet their replacement obligations, they must find additional augmentation sources or pump and meter the dewatering water from Pit 21 directly back to the river to offset depletions. Lagged depletions to the stream will occur following the lining of Pit

21, as recharge through Pit 20 from the dewatering is discontinued. Six months prior to the completion of the liner of Pit 21, LRM must submit an SWSP to replace the lagged dewatering depletions based on actual recorded dewatering rates during mining. All dewatering activities must be metered with a totalizing flow meter that is recorded and reported on the submitted monthly accounting.

Mining at Pit 21 will consume water by three additional processes: water carried away in washed aggregate, concrete production, and dust control. The same consumption rates decreed in Case No. 00CW142 of 30 gallons of water per cubic yard of concrete and 9.6 gallons of water per ton (four percent by weight) of aggregate sold were assumed for this analysis and are not anticipated to change when using product from Pit 21. Total production numbers at the Larimer Pits will not exceed the amounts decreed in Case No. 00CW142 during the mining of Pit 21 and depletions resulting from production at Pit Nos. 13, 14, 15, 18 and 20 will continue to be augmented under the conditions of the decree. The decreed and augmented production numbers and production depletions are summarized in the attached Table 2. All of the production water requirements are assumed to be 100% consumptive and result in a maximum of 16.52 ac-ft per year of depletions. As defined in the decree, LRM requests that monthly production numbers may exceed the monthly estimates so long as the total maximum annual amount of depletions is not exceeded, and the actual monthly total depletion is replaced.

The IDS Alluvial Water Accounting System (AWAS) analytical stream depletion model, which uses the Glover method, was used to calculate the lagged depletions and accretions to the Big Thompson River. The following parameters were used in the model to lag depletions from the cessation of dewatering of Pit 20, the "first fill" of Pit 20, the dewatering of Pit 21, the accretions from the water pumped from Pit 21 into Pit 20, and mining operations at Pit 21.

Aquifer Parameters

Pit	X (ft)	W (ft)	T (gpd/ft)	S
20	1,071	2,105	34,264	0.2
21	1,499	2,070	35,014	0.2

The total lagged net depletion to the stream was determined to be 191.76 acre-feet for this plan period. The attached Tables 1 and 2 shows the monthly breakdown of lagged depletions, accretions, and net impact on the stream for the plan period of October 21, 2019 through July 31, 2021.

Replacements

LRM obtained a conditional storage right for LRM Ponds 1 (WDID 0403714) and 2 (WDID 0403715) for a combined total of 550 acre-feet in Water Court Case 98CW143. LRM Ponds 1 and 2 were awarded a priority date of November 13, 1998 and may be used for augmentation, exchange and substitute supply, recreation, fish propagation and wildlife habitat. The ponds may also be used to store LRM's additional Barnes Ditch credits changed in Case No. 00CW143 that are used to replace non-irrigation season depletions under its augmentation plan decreed in Case No. 00CW142. LRM currently has approximately 397 acre-feet of water in storage in LRM Ponds 1 and 2, of which approximately 242 was stored under its storage decree and is not required to replace depletions within Case No. 00CW142.

The LRM Ponds 1 and 2 are located within the Larimer Pits property boundary as shown in Figure 1, and deliver water to the Big Thompson River upstream of the location of lagged depletions resulting from Pit No. 20 and upstream of the Rist and Goss Ditch headgate. There are no intervening rights between the location of the reservoir releases and the ditch headgate, and transit loss should be minimal. The lagged dewatering depletions and water that is stored out of priority through infiltration will be replaced by releases from storage in LRM Ponds 1 and 2. Daily inflows into Pit No. 20 will be less than LRM's available release rates of its augmentation water in LRM Ponds 1 and 2, which LRM currently estimates to be 2 cfs. If for any reason sufficient water is not able to be replaced by LRM's storage releases, LRM will also have the ability to release all out-of-priority inflows from Pit No. 20 by continuing to dewater to the level reached while in priority or augmented.

During times of a downstream call, deliveries will be made from LRM Ponds 1 and 2 in the amounts shown Column 9 of Table 1.

LRM has also requested the ability to deliver water through the Rist and Goss Ditch into Pit No. 20 at times of free river or if augmentation supplies are available at a high enough daily rate, dependent on available ditch capacity. Water delivered to Pit No. 20 during periods of free river does not require replacement, and will have the result of reducing the quantity of water that must be replaced under the "first fill". If water is released from LRM Ponds 1 and 2 to the Rist and Goss Ditch and delivered into Pit No. 20, that water must be used in accordance with the decree entered in Case No. 98CW143. Any deliveries through the ditch must be coordinated with the water commissioner prior to diversion.

The existing accounting form will be revised to track the dewatering amounts for Pit 21 and the return flows accruing from Pit 20, and to account for augmentation water released from LRM Ponds 1 and 2. **No recharge credit will be granted for water delivered to Pit 20 until the Applicant has first shown that 168 acre-feet of water have either infiltrated into or been delivered to Pit 20 to account for the "first fill".**

Long Term Augmentation

Long term depletions from evaporation out of Pit 20 are covered in the augmentation plan under Case No. 00CW142. LRM plans to install a clay liner in Pit 21 once mining is complete. Six months prior to the completion of the liner of Pit 21, LRM will submit a new SWSP request to replace lagged dewatering depletions based on actual recorded dewatering rates during mining.

In accordance with the letter dated April 30, 2010 (copy attached) from the Colorado Division of Reclamation, Mining, and Safety ("DRMS"), all sand and gravel mining operators must comply with the requirements of the Colorado Reclamation Act and the Mineral Rules and Regulations for the protection of water resources. The April 30, 2010 letter from DRMS requires that you provide information to DRMS to demonstrate you can replace long term injurious stream depletions that result from mining related exposure of groundwater. The DRMS letter identifies four approaches to satisfy this requirement.

On February 24, 2016, DRMS approved Amendment AM03 to Permit No. M-1974-069 to add the 32.78 acres known as Pit 21 to the permit boundary, with a planned clay liner for Pit 21 to comply with reclamation requirements. In accordance with the reclamation plan approved in Amendment

AM03, an increased bond was obtained for $546,800.00 through the DRMS to cover the cost of lining Pit 21.

Conditions of Approval

I hereby approve this SWSP amendment, in accordance with § 37-90-137(11), C.R.S., subject to the following conditions:

1. This SWSP shall be valid for the period of October 22, 2019 through July 31, 2021, unless otherwise revoked or superseded by decree. If depletions associated with operation under this SWSP will extend beyond the plan's expiration date, a renewal request must be submitted to this office with the statutory fee (currently $257) prior to the expiration date but no later than **June 1, 2021**. If a renewal request is received after the expiration date of this plan, it may be considered a request for a new SWSP in which case the $1,593 filing fee will apply.
2. Well permit no. 83763-F has been obtained for the current use of Pit No. 21 in accordance with § 37-90-137(2) and (11), C.R.S., in conjunction with this plan. The Larimer Pits site is also operated under permit no. 62009-F (Pit Nos. 13, 14, and 15) and permit no. 69035-F (Pit Nos. 18 and 20).
3. No groundwater shall be exposed in Pit 21.
4. The total net impact to the stream from the cessation of dewatering/first fill at Pit 20 and mining/dewatering operations at Pit 21 during this plan period must not exceed 191.76 acre-feet (estimated based on 11.1 acre-feet of lagged dewatering depletions from Pit 20, 158.8 acre-feet of lagged depletions from the "first fill" of Pit 20, 236.5 acre-feet of lagged dewatering depletions from Pit 21, 241.1 acre-feet of lagged accretions from water delivered from Pit 21 into Pit 20, and 26.46 acre-feet of lagged depletions from mining operations at Pit 21).
5. The annual amount of groundwater used for operational purposes at the Larimer Pits site shall not exceed 16.52 acre-feet, estimated as 4.42 acre-feet for dust suppression, 11.51 acre-feet for concrete production, and 0.59 acre-feet lost with the removal of 20,000 tons of washed product.
6. Total consumption at Pit Nos. 20 and 21 under this SWSP must not exceed the aforementioned amount unless an amendment is made to this plan.
7. Approval of this plan is for the purposes as stated herein. This office must first approve any additional uses for the water.
8. The replacement water that is the subject of this plan cannot be sold or leased to any other entity. As a condition of subsequent renewals of this SWSP, the replacement water must be appurtenant to this site until a plan for augmentation is obtained.
9. All releases of replacement water must be sufficient to cover all out-of-priority depletions in time, place, and amount and must be made under the direction and/or the approval of the water commissioner. Notice must be provided and approval made by the water commissioner at least 48 hours prior to the release of replacement water, or as required by the water commissioner.

10. If approved by the division engineer, the release of replacement water may be aggregated to maximize beneficial use. The water commissioner and/or the division engineer shall determine the rate and timing of any aggregated release.

11. Conveyance loss for delivery of augmentation water is subject to assessment and modification as determined by the water commissioner or division engineer.

12. Adequate accounting of depletions and replacements must be provided to the division engineer in Greeley (DNR_Div1Accounting@state.co.us) and the water commissioner (Jean Lever at Jean.Lever@state.co.us) on a monthly basis or other interval acceptable to both of them. Submitted accounting shall conform to the Administration Protocol *"Augmentation Plan Accounting, Division One – South Platte Basin"* (attached). For the duration of this SWSP, it is acceptable for the accounting to be incorporated with the accounting for case no. 00CW142 and not reported separately.

13. The name, mailing address, and phone number of the contact person who will be responsible for operation and accounting of this plan must be provided on the accounting forms to the division engineer and water commissioner.

14. Applicant shall follow the attached Recharge Protocol for the operation of this SWSP.

15. The Applicant must account for the depletions and accretions that result from the dewatering operations. If at any time it is found that the dewatering accretions and other replacement sources are not adequate to replace the depletions resulting from the mining operation, including the dewatering depletions, an amendment to this SWSP must be obtained. All dewatering activities must be metered with a totalizing flow meter that is recorded and reported on the submitted monthly accounting. At least three years prior to the completion of dewatering, a plan must be submitted that specifies how the post pumping dewatering depletions will be replaced, in time, place and amount.

16. In accordance with the letter dated April 30, 2010 (copy attached) from the DRMS, all sand and gravel mining operators must comply with the requirements of the Colorado Reclamation Act and the Mineral Rules and Regulations for the protection of water resources. The April 30, 2010 letter from DRMS requires that you provide information to DRMS to demonstrate that you can replace long term injuries stream depletions that result from mining related exposure of groundwater. The DRMS letter identifies four approaches to satisfy this requirement.

    In accordance with approach nos. 1 and 3, you have indicated that a bond has been obtained for $546,800.00 through the DRMS for lining of this site to assure that depletions from groundwater evaporation do not occur in the unforeseen event, or events, that would lead to the abandonment of the Pit.

17. The state engineer may revoke this SWSP or add additional restrictions to its operation if at any time the state engineer determines that injury to other vested water rights has or will occur as a result of the operation of this SWSP. Should this SWSP expire without renewal or be revoked prior to adjudication of a permanent plan for augmentation, the Applicant will still be liable for the depletions caused by the lagged dewatering depletions and from the "first fill" of the pit.

18. In accordance with amendments to § 25-8-202-(7), C.R.S. and "Senate Bill 89-181 Rules and Regulations" adopted on February 4, 1992, the State Engineer shall determine if the substitute supply is of a quality to meet the requirements of use to which the senior

appropriation receiving the substitute supply has normally been put. As such, water quality data or analyses may be requested at any time to determine if the requirement of use of the senior appropriator is met.

19. The decision of the state engineer shall have no precedential or evidentiary force, shall not create any presumptions, shift the burden of proof, or serve as a defense in any water court case or any other legal action that may be initiated concerning the SWSP. This decision shall not bind the state engineer to act in a similar manner in any other applications involving other SWSPs or in any proposed renewal of this SWSP, and shall not imply concurrence with any findings of fact or conclusions of law contained herein, or with the engineering methodologies used by the Applicant.

Should you have any questions regarding this approval, please contact Michael Hein in Greeley at 970-352-8712 or Javier Vargas-Johnson of this office.

Sincerely,

for Jeff Deatherage, P.E.
Chief of Water Supply

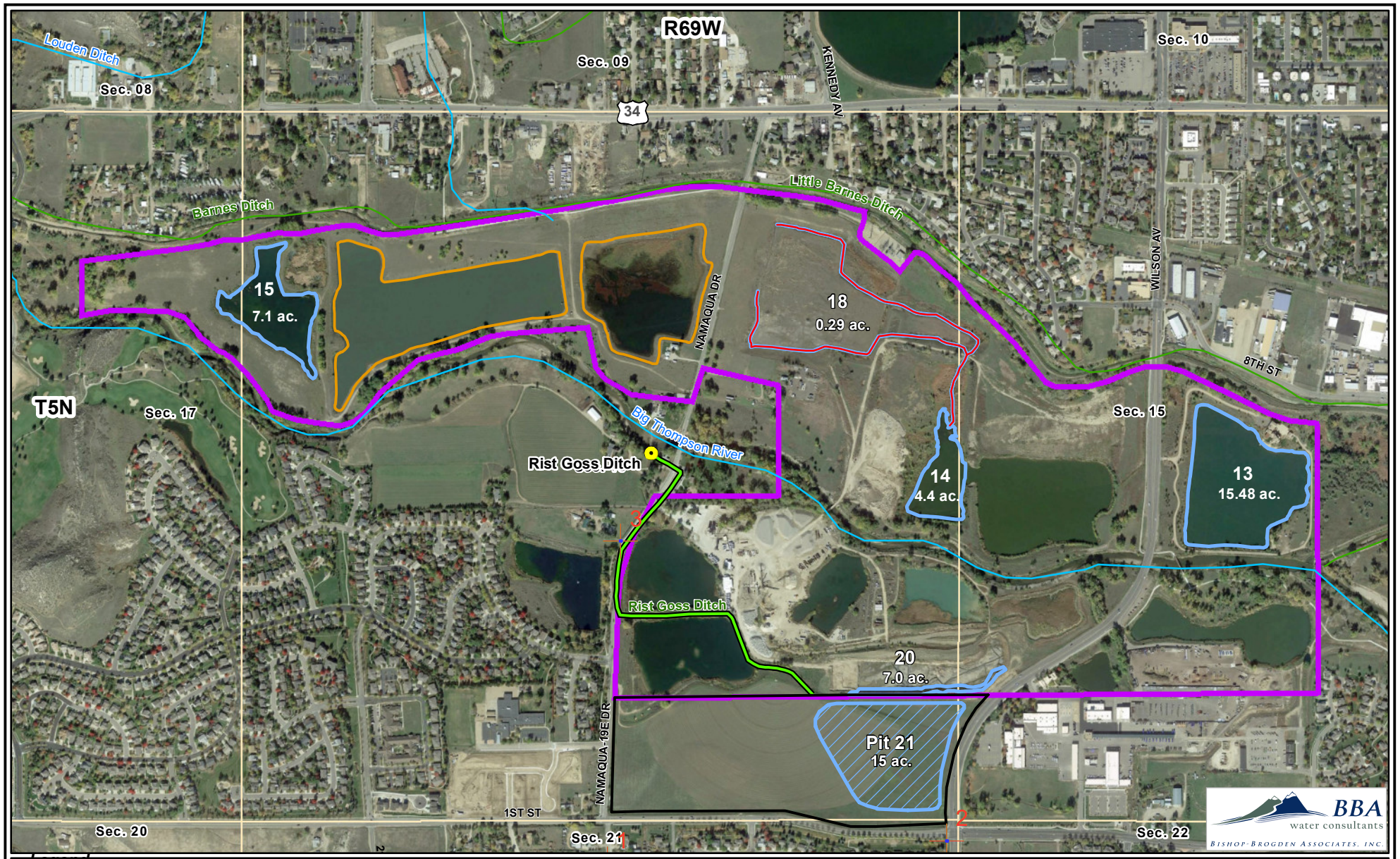
Attachments: Figure 1
Table 1
Table 2
Letter from DRMS dated April 30, 2010
Administration Protocol *"Augmentation Plan Accounting, Division One – South Platte River"*
Administration Protocol *"Recharge, Division One – South Platte River"*

Cc: Michael Hein, Lead Assistant Division Engineer, Michael.Hein@state.co.us
810 9th Street, Ste. 200, Greeley, CO 80631, (970) 352-8712

Jean Lever, Water Commissioner, Water District 4, Jean.Lever@state.co.us

Louis Flink, Tabulation/Diversion Records Coordinator, Louis.Flink@state.co.us

Amy Eschberger, Division of Reclamation Mining and Safety, Amy.Eschberger@state.co.us



Legend

- Rist Goss Ditch
- Pit 21
- Additional Pit 21 Mining Area
- Current Post 1981 Exposed Surface Area (for 13,14, 15, 18, and 20)
- Loveland Ready-Mix Ponds 1 and 2
- Property Boundary

Figure 1
Loveland Ready-Mix Property
Larimer Pits Site

Date: 8/27/2019 | Job No. 9641.01
Aerial Photo Date: 10/14/2017 Google Earth | Data Source: CDSS, USGS, BLM

N
W E
S

1 inch = 1,000 feet

0 500 1,000
Feet

Overview Map

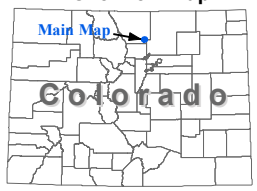


Table 1

Loveland Ready Mix Concrete

Summary of Pit 20 Pond and Pit 21 Pond Lagged Stream Impacts

		Pit 20 Dewatering and Refill				Pit 21 Dewatering				
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
	Month	Pit 20 Dewatering Pumping (af)	Lagged Pit 20 Dewatering Stream Impact (af)	Pit 20 Aquifer Infiltration Refill (af)	Lagged Pit 20 Aquifer Refill (af)	Pit 21 Dewatering Pumping (af)	Lagged Pit 21 Dewatering Stream Impact (af)	Pit 20 Recharge from Pit 21 Dewatering (af)	Lagged Pit 20 Discharge Stream Impact (af)	Net Stream Impact (af)
Aug-19	1	0.0	-10.9	13.5	-2.6	0.0	0.0	0.0	0.0	-13.5
Sep-19	2	0.0	-6.9	13.5	-6.6	0.0	0.0	0.0	0.0	-13.5
Oct-19	3	0.0	-4.5	13.5	-9.0	0.0	0.0	0.0	0.0	-13.5
Nov-19	4	0.0	-2.9	13.5	-10.6	0.0	0.0	0.0	0.0	-13.5
Dec-19	5	0.0	-1.8	13.5	-11.7	13.5	-1.3	13.5	2.6	-12.1
Jan-20	6	0.0	-1.1	13.5	-12.4	13.5	-5.1	13.5	6.6	-12.0
Feb-20	7	0.0	-0.6	13.5	-12.9	13.5	-8.1	13.5	9.0	-12.6
Mar-20	8	0.0	-0.2	13.5	-13.3	13.5	-10.1	13.5	10.6	-13.0
Apr-20	9	0.0	0.0	13.5	-13.5	13.5	-11.4	13.5	11.7	-13.2
May-20	10	0.0	0.0	13.5	-13.5	13.5	-12.3	13.5	12.4	-13.3
Jun-20	11	0.0	0.0	13.5	-13.5	13.5	-12.9	13.5	12.9	-13.4
Jul-20	12	0.0	0.0	13.5	-13.5	13.5	-13.3	13.5	13.3	-13.5
Aug-20	13	0.0	0.0	6.0	-12.0	13.5	-13.5	13.5	13.5	-12.0
Sep-20	14	0.0	0.0	0.0	-8.7	13.5	-13.5	13.5	13.5	-8.7
Oct-20	15	0.0	0.0	0.0	-5.6	13.5	-13.5	13.5	13.5	-5.6
Nov-20	16	0.0	0.0	0.0	-3.6	13.5	-13.5	13.5	13.5	-3.6
Dec-20	17	0.0	0.0	0.0	-2.3	13.5	-13.5	13.5	13.5	-2.3
Jan-21	18	0.0	0.0	0.0	-1.4	13.5	-13.5	13.5	13.5	-1.4
Feb-21	19	0.0	0.0	0.0	-0.8	13.5	-13.5	13.5	13.5	-0.8
Mar-21	20	0.0	0.0	0.0	-0.4	13.5	-13.5	13.5	13.5	-0.4
Apr-21	21	0.0	0.0	0.0	-0.1	13.5	-13.5	13.5	13.5	-0.1
May-21	22	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Jun-21	23	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Jul-21	24	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Aug-21	25	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Sep-21	26	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Oct-21	27	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Nov-21	28	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Dec-21	29	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Jan-22	30	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Feb-22	31	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Mar-22	32	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Apr-22	33	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
May-22	34	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Jun-22	35	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
Jul-22	36	0.0	0.0	0.0	0.0	13.5	-13.5	13.5	13.5	0.0
			-28.8		-168.0					-192.0

Notes

[1] Previous dewatering at Pit 20 was assumed to average 100 gpm as was discontinued by month 1.

[2] Lagged Pit 20 Dewatering Stream Impacts result from the discontinuation of dewatering pumping delivered to the Big Thompson River on a constant basis.

[3] Pit 20 Aquifer Infiltration Refill is the amount of ground water contributing to the first fill of Pit 20 was the dewatering pumps are removed. Assumes ground water infiltration of 100 gpm based on previous dewatering rates.

[4] The first fill of Pit 20 will be accomplished through groundwater infiltration and dewatering of Pit 21 pumped into Pit 20.

[5] Pit 21 will be dewatered into Pit 20. Dewatering rates are assumed to remain constant at an estimated 100 gpm. Initial dewatering will contribute to the first fill of Pit 20 and once the aquifer is refilled, the dewatering will result in an eqiivalent rate of recharge to the stream.

[6] Dewatering of Pit 21 is anticipated to occur at a rate of 100 gpm. The impacts to the stream have been lagged assuming the groundwater parameters identified belo

[7] Dewatering from Pit 21 into Pit 20 is assumed to occur at a constant rate of 100 gpm through out the mining of Pit 21.

[8] Following the first fill of Pit 20, all additional water delivered from Pit 21 into Pit 20 will be recharged to the stream.

[9] Equal to [2] + [4] + [6] + [8].

Positive values occur when recharge exceeds dewatering stream depletions and are a credit to the steram.

Negative values represent depletions to the stream.

Assumes Pit 20 and 21 dewatering rates of 100 gpm.

Pit 21: T= 35,14 gpd/ft, S= 0.2, X = 1,499 ft, W = 2,070 ft.

Pit 20: T = 34,264 gpd/ft, S = 0.2, X = 1,071 ft, W = 2,15 ft.

Dewatering depletions resulting from Pit 21 will occur once mining is complete or the pit is lined.

Table 2
Loveland Ready - Mix Concrete, Inc. - #M-74-069 Larimer Pits
Future Lagged Depletions Due to Production and Dewatering at Pit 21 and First Fill of Pit 20

Month	Concrete Production (1)		Washed Product Sales (2)		Dust Control (3)		Total Projected Water Consumption (4)		Lagged Production Production Depletions (5)	Net Lagged Depletions From Pits 20 and 21 Dewatering and Refill (6)	Total Net Stream Impact (7)
	Projected	Consumption	Projected	Consumption	Projected	Consumption					
	(Cu Yards)	(Gallons)	(Ton)	(Gallons)	(Gallons)	(Gallons)	(Gallons)	(Acre-Feet)	(Acre-Feet)	(Acre-Feet)	(Acre-Feet)
Jan-19	3,706	111,180	0	0	28,000	28,000	139,180	0.43	0.45		
Feb-19	2,464	73,920	0	0	28,000	28,000	101,920	0.31	0.34		
Mar-19	3,442	103,260	0	0	30,000	30,000	133,260	0.41	0.40		
Apr-19	6,311	189,330	0	0	48,000	48,000	237,330	0.73	0.66		
May-19	6,233	186,990	0	0	32,000	32,000	218,990	0.67	0.66		
Jun-19	7,346	220,380	0	0	22,000	22,000	242,380	0.74	0.72		
Jul-19	7,562	226,860	0	0	185,000	185,000	411,860	1.26	1.35		
Aug-19	7,713	231,390	0	0	232,000	232,000	463,390	1.42	1.36	13.50	-14.86
Sep-19	6,786	203,580	0	0	142,000	142,000	345,580	1.06	1.11	13.50	-14.61
Oct-19	9,934	298,020	1,500	14,403	110,000	110,000	422,423	1.30	1.26	13.50	-14.76
Nov-19	6,238	187,140	827	7,938	110,000	110,000	305,078	0.94	1.00	13.50	-14.50
Dec-19	9,124	273,720	1,110	10,653	110,000	110,000	394,373	1.21	0.32	12.15	-12.46
Jan-20	9,529	285,870	823	7,904	110,000	110,000	403,774	1.24	0.52	12.00	-12.52
Feb-20	10,659	319,770	1,152	11,062	110,000	110,000	440,832	1.35	0.77	12.59	-13.36
Mar-20	8,533	255,990	1,172	11,256	110,000	110,000	377,246	1.16	0.95	12.97	-13.92
Apr-20	11,509	345,270	1,975	18,958	110,000	110,000	474,228	1.46	1.07	13.21	-14.28
May-20	12,328	369,840	1,979	19,000	150,000	150,000	538,840	1.65	1.22	13.34	-14.57
Jun-20	11,047	331,410	2,140	20,546	150,000	150,000	501,956	1.54	1.37	13.43	-14.80
Jul-20	11,282	338,460	2,410	23,131	150,000	150,000	511,591	1.57	1.46	13.47	-14.93
Aug-20	10,814	324,420	3,502	33,620	110,000	110,000	468,040	1.44	1.50	12.03	-13.53
Sep-20	14,003	420,090	1,409	13,529	110,000	110,000	543,619	1.67	1.51	8.68	-10.19
Oct-20	9,934	298,020	1,500	14,403	110,000	110,000	422,423	1.30	1.52	5.57	-7.10
Nov-20	6,238	187,140	827	7,938	110,000	110,000	305,078	0.94	1.43	3.61	-5.03
Dec-20	9,124	273,720	1,110	10,653	110,000	110,000	394,373	1.21	1.30	2.29	-3.59
Jan-21	9,529	285,870	823	7,904	110,000	110,000	403,774	1.24	1.26	1.40	-2.65
Feb-21	10,659	319,770	1,152	11,062	110,000	110,000	440,832	1.35	1.26	0.79	-2.05
Mar-21	8,533	255,990	1,172	11,256	110,000	110,000	377,246	1.16	1.26	0.38	-1.64
Apr-21	11,509	345,270	1,975	18,958	110,000	110,000	474,228	1.46	1.26	0.10	-1.36
May-21	12,328	369,840	1,979	19,000	150,000	150,000	538,840	1.65	1.33	0.00	-1.33
Jun-21	11,047	331,410	2,140	20,546	150,000	150,000	501,956	1.54	1.42	0.00	-1.42
Jul-21	11,282	338,460	2,410	23,131	150,000	150,000	511,591	1.57	1.47	0.00	-1.47
2019 Total	76,859	2,305,770	3,437	32,993	1,077,000	1,077,000	3,415,763	10.48	9.65	66.15	-71.20
2020 Total	125,000	3,750,000	20,000	192,000	1,440,000	1,440,000	5,382,000	16.52	14.61	123.21	-137.82
2021 Total	74,887	2,246,610	11,652	111,858	890,000	890,000	3,248,468	9.97	9.26	2.66	-11.93

Notes:
(1) Projected future concrete production.
Water consumption based on 30 gallons of water/cubic yard of concrete.
(2) Projected future washed aggregate production based on future mining estimates.
Water consumed in washed aggregate equals 9.6 gallons/ton (4%).
(3) Dust control uses assumed to be 100% consumptive.
(4) (1) + (2) + (3)
(5) Lagged depletions are based on actual production numbers through September 2019, lagging factors decreed in Case No. 00CW142 through November 2019, and lagging factors for Pit 21 beginning in December 2019. Depletions to be replaced by augmentation plan decreed in Case No. 00CW142.
(6) See previously submitted Table 1. Depletions to be replaced by releases from LRM Ponds 1 and 2.
(7) Equal to -(5)-(6). (Negative value represents the total amount owed to the stream).

Larimer Pit Ground water parameters
Pit 21: T = 35,014 gpd/ft, S = 0.2, X = 1,499 ft, W = 2,070 ft.
Original Larimer Pits: T = 34,264 gpd/ft, S = 0.2, X = 1,071 ft, W = 2,105 ft.

Pit 21 Monthly Lagging Factors

Month:	1	2	3	4	5	6	7	8	9
Depletion:	9.58%	27.94%	22.54%	14.51%	9.94%	6.38%	4.38%	2.88%	1.85%

Washed product includes any mined material.
Monthly production values are estimates and may vary so long as annual consumption is not exceeded.

STATE OF COLORADO

DIVISION OF RECLAMATION, MINING AND SAFETY
Department of Natural Resources

1313 Sherman St., Room 215
Denver, Colorado 80203
Phone: (303) 866-3567
FAX: (303) 832-8106

COLORADO DIVISION OF RECLAMATION MINING & SAFETY

April 30, 2010

Lafarge West, Inc.
10170 Church Ranch Way, Ste. 200
Westminister, CO 800210000

RE: Mining Operations with Exposed Ground water

To Whom It May Concern:

The Division of Reclamation Mining and Safety is responsible for ensuring that Sand and Gravel mining operators comply with the requirements of the Colorado Land Reclamation Act for the Extraction of Construction Materials (Act) and the Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials (Rules). Among these requirements are provisions for the protection of water resources. The Act requires that reclamation plans must ensure minimization of disturbances to the prevailing hydrologic balance, including disturbances to the quantity of water in the area affected by mining and in the surrounding areas. § 34-32.5-116(4)(h). Rule 3.1.6(1)(a) requires compliance with Colorado water laws and regulations governing injury to existing water rights both during and after mining. Permits must specify how the permittee will comply with applicable Colorado water laws and regulations governing injury to existing water right rights. Rule 6.3.3(j); Rule 6.4.5(2)(c). After an extensive review, the Division determined that several operators may not have appropriate permit conditions to address certain reclamation liabilities arising from impacts to water resources.

In September 2009 the Division of Water Resources (DWR) updated its Guidelines for Sand and Gravel Pits. These guidelines provide guidance on achieving compliance with state law regarding replacement of depletions from sand and gravel mining, thus the guidelines provide a benchmark for the protection of hydrologic balance required under the Act and Rules. As noted in the Guidelines, sand and gravel operations which expose groundwater without complying with state law create a reclamation liability by impacting available groundwater.

State law requires that any person exposing ground water must obtain a well permit from the SEO pursuant to § 37-90-137(11). Because exposed groundwater results in out-of-priority water depletions, operations which expose ground water must also eventually obtain a water-court approved augmentation plan. Currently, several operators do not have either an augmentation plan or bonding to provide an alternative method to mitigate injurious stream depletions that result from mining-related exposure of ground water. The Division has a statutory duty to ensure that lands affected by mining are reclaimed in a manner that complies with state law and to ensure that operators have sufficient bonding to achieve reclamation. In order to assist operators in achieving compliance with these requirements, the Division proposes that, by April 30, 2011, operators should contact the Division and agree upon a plan for achieving compliance.

The Division has identified four approaches for operators:

1. File a financial warranty that will ensure backfilling of the pit to cover the exposed ground water to a depth of two feet above the static ground water level or,

2. Obtain a court approved augmentation plan prior to exposing ground water or,

3. File a financial warranty to cover the cost of installing a clay liner or slurry wall that meets the Division of Water Resources requirements for preventing ground water exposure or,

4. Obtain approval from the Division of Water Resources that acknowledges compliance with the SEO's requirements pursuant to § 37-90-137(11).

The Division will work with operators on an individual basis as they move to implement one of these plans. It is likely that options 1 and 3 will require the submittal of a technical revision or an amendment to the existing permit depending on the nature of the current mining and reclamation plan and the proposed changes. Increased financial warranties, as a result of these modifications, may be posted in a phased manner not to exceed three years. Amendments or revisions currently under review will be required to be approved by April 30, 2011 and may use the phased financial warranty approach described above. New applications going forward or presently under review by the Division will be required to meet the requirements of one of the options 1-4 at the time of application approval. Failure of affected operators to initiate contact with the Division and gain compliance as described above could result in an enforcement action being issued by the Division.

If you have any questions, please contact Tony Waldron at 303-866-3567, extension 8150.

cc:

M2006064	Shields at Fossil Creek Mine			M1983031	Stromquist Pit
M1994002	Andrews S & G #5 (Burlington Pit)			M1974072	Chantala Pit
M2006018	North Bank Resources			M1985218	Rich Pit
M2006073	Sundance Sand and Gravel Resource			M1985206	Boone-Martin Pit
M2009082	Parsons Mine			M1995022	Andrews #2
M1977081	Greeley West Pit			M1990144	Boone-Fillmore Pit
M2003091	Duckworth Pit			M1997087	Hartman Pit
M2000113	Mamm Creek Sand & Gravel			M2001094	Shaw Pit
M2001090	River Valley Resource			M2002009	Beeman Pit #1
M2000016	Riverbend Operation			M1981307	Fountain Pit
M1979134	Powers Pit			M1977439	Home Office Mine
M1977036	Greeley 35th Ave Pit			M1979191	Three Bells Pit
M2000034	Reichert Pit			M1982182	Port of Entry Pit
M2001051	North Taft Hill Expansion Site			M2002081	Overland Ponds
M1974015	Lyons Pit			M1981088	McCoy Pit
M1974004	Specification Aggregates Quarry			M1982034	Miller Pit
M1987176	Hamm Pit			M1996082	Blair Mesa Pit
M1988042	Cottonwood Pit			M1980136	Chambers Pit
M1990112	State Pit			M1977098	Sievers Pit
M1979002	North Delta Pit	M1983013	Latham - Burkett Pit	M1974070	Nelson Pit
M1979159	Brose Pit	M1979097	East Rigden Pit	M2000002	Tanabe Pit
M1998014	Gypsum Ranch Pit	M1991035	Bluestone Pit	M1994045	Bluestone Pit
M1999088	Kyger Pit	M1986159	Courtner Pit	M1986079	M & G Pit
M1998075	Andrews #3 (Mock Pit)				

ADMINISTRATION PROTOCOL
Recharge
Division One – South Platte River

The purpose of a "recharge structure" as referenced in this document is to introduce water to the river alluvium that will result in accretions to a live stream. For the purposes of this document, a recharge structure does not include a well that is used to artificially recharge a Denver Basin bedrock aquifer. With that qualification, a recharge structure is defined as:

- A section of ditch, the losses from which can be reasonably modeled as a single source of water.
- A pond or group of ponds that receive water from the same delivery location and can be reasonably modeled as a single source of water.

1. A written notification for each recharge structure must be provided to the water commissioner and division engineer. **The Division of Water Resources will not acknowledge any recharge activity conducted without the knowledge of the water commissioner.** The notification must include:
    a. a map showing the location of the structure and the court case number of the plan for augmentation authorized to use the structure;
    b. a map showing the location of the diversion point and the court case number for the decree authorizing the diversion, if any;
    c. a map showing the location of and all information for the metering location;
    d. the maximum water surface area of the structure;
    e. for ditch structures, if the ditch is divided into more than one recharge reach, an explanation of how the volume diverted will be allocated to the various sections.
2. Upon receiving written notification or decree by the water court, the division engineer will assign the structure a WDID number. The WDID number is the identification number that will be used for the administration of the structure and must be included in all correspondence and accounting reports. **(For structures that were included in a decreed plan for augmentation but were not physically constructed at the time of the decree, a written notification of the intent to construct the structure must be provided.)**
3. Any structure that intercepts groundwater must be permitted as a well and included in a plan for augmentation or substitute water supply plan approved by the state engineer. The division engineer strongly recommends avoiding recharge structures that intercept groundwater, in order to simplify the accounting process.
4. The flow into **EVERY** recharge structure **MUST** be metered and equipped with a continuous flow recorder unless the water commissioner in conjunction with the division engineer determines adequate records may be kept without such equipment. If the recharge structure is designed to discharge water via a surface outlet, such discharge must also be metered and equipped with a continuous flow recorder. The water commissioner **MUST** approve the use of the recharge structure **BEFORE** any credit will be given for water placed into recharge.

5. All recharge ponds must have a staff gauge installed such that the gauge registers the lowest water level in the pond. The staff gauge must be readable from a readily accessible location adjacent to the pond.
6. All recharge areas must be maintained in such a way as to minimize consumptive use of the water by vegetation. **No recharge area may be used for the planting of crops during the same irrigation year that it is used as a recharge site without prior approval from the water commissioner or division engineer.**
7. The amount of water recharged to the alluvial aquifer is determined by measuring the amount of water delivered to the recharge structure and subtracting:
    a. the amount of water discharged from the recharge structure,
    b. the amount of water lost to evaporation (see item 8, below),
    c. the amount of water lost to consumptive use due to vegetation located within the recharge structure, and
    d. the amount of water retained in the recharge structure that has not yet percolated into the ground.
8. Net evaporative losses from the recharge structure must be subtracted from the volume of water delivered to the pond. Evaporative losses must be taken every day the pond has a visible water level. If the pond does not have a stage-surface area curve approved by the water commissioner, the maximum surface area of the pond must be used to determine the evaporative losses. Monthly loss factors prorated for the number of days the pond had a visible water level may be used as may real time evaporation data from NOAA or a local weather station. If the pond is not inspected on a routine basis through the month, no prorating of monthly factors will be allowed.
9. The amount of accretions from the recharge structure will be credited only in accordance with a decreed plan of augmentation or substitute water supply plan approved by the State Engineer.
10. All water delivered for recharge must be fully consumable:
    a. changed reservoir rights or the CU portion of changed senior ditch rights;
    b. transbasin water that has been imported into the South Platte River basin;
    c. nontributary water;
    d. excess (unused) accretions from the previous recharge of fully consumable water;
    e. water diverted in priority after "notice" of intent to fully consume the water;
    f. water diverted under free river.
11. Water may be delivered to recharge only if the net impact of the associated plan for augmentation is not negative. Water must first be delivered or exchanged to offset negative impacts of the plan for augmentation before it may be diverted for recharge.
12. Accounting must be performed on a daily basis with reports submitted at least monthly and within 30 days of the end of the month for which the accounting is being made. The volume of water diverted into recharge must be provided to the water commissioner weekly when requested by the water commissioner.

ADMINISTRATION PROTOCOL
Augmentation Plan Accounting
Division One – South Platte River

This protocol establishes the accounting and reporting process required to enable the division engineer's office to confirm that depletions from all out-of-priority diversions are being replaced so as to prevent injury to vested water rights. The accounting must comport with established "cradle to grave" accounting standards, which allow an audit of the information to track exactly how the data is manipulated as it is translated from raw input data to the resultant impact on the river. While this protocol is subordinate to any decreed language addressing specific accounting requirements, it generally addresses the minimum requirements of such accounting.

The accounting must use the standard convention where a depletion is "negative" and an accretion or other replacement source is "positive". The sum of the impacts will then result in either a "negative" or "positive" impact on the stream.

Wells in plans that have a negative stream impact must provide additional replacement water, curtail pumping or both until the impact is no longer negative. Plans with a negative stream impact that fail to curtail pumping will be ordered to stop pumping until such time as the projected impact of the wells is no longer negative.

1. Accounting must be submitted electronically to the water commissioner (call 970-352-8712 to obtain email address) and division engineer at Div1Accounting@state.co.us within 30 days of the end of the month for which the accounting is being submitted.
2. The accounting must provide the **contact information** including name and address for:
    a. the owner(s) of each well
    b. the person responsible for submitting the accounting
    c. the plan administrator and/or the plan attorney.
3. All **input data** must be in one location, such as an "Input" worksheet, etc. The accounting must show all pumping. Input data includes the information listed below.
    a. The required input data for each **well** is:
        i. the monthly meter reading for wells that use a **presumptive depletion factor** (PDF) to determine the associated consumptive use (CU); or
        ii. the monthly CU in acre-feet (AF) for wells that have a decree or approved SWSP that allows the wells to use a **water balance methodology** to determine the CU of the well. The analysis used to determine the CU must be included with the accounting.
        iii. Wells that are decreed as an **alternate point of diversion** (APOD) to a surface water right must report pumping on a daily basis if any of the diversion during the month is claimed as being "in priority". (See *Administration Protocol – APOD Wells* for more details.)

iv. The well meter serial readings for each meter shall be included if there is more than one meter on a well.

b. Each **recharge site** must comply with the *Administration Protocol - Recharge* and must report the:

i. daily volume in AF diverted into the site;

ii. monthly volume in AF released from the site;

iii. monthly net evaporative loss in AF;

iv. volume of water in AF remaining at the end of the month.

c. The accounting must identify each source of **fully consumable replacement water** actually delivered to the location impacted by the depletions. To demonstrate the water was actually delivered to the required location will require the following information:

i. the originating source of the water, date released and volume of water released;

ii. transportation losses to point of diversion or use, if any, using stream loss factors approved by the water commissioner;

iii. the volume of water actually delivered on a daily basis past any surface water diversion that was sweeping the river as corroborated by the water commissioner.

(See *Administration Protocol – Delivery of Water* for more details on delivering water.)

d. For each source of **replacement water that has been "changed"** for use as a source of augmentation, such as changed reservoir shares, ditch bypass credits or credits from dry-up, etc., the following input information must be reported:

i. the basis and volume of the return flow obligation;

ii. the location the changed water was historically used; this will be the location used to determine the timing of the return flow impact on the river.

4. The accounting must include a monthly **projection** of the plan's operation at least through March 31 of the next calendar year.

5. The accounting must include all input and output files associated with **modeling the delayed impact** of diversions. The output from the modeling must report to a summary table that shows, by month, the ongoing depletions associated with pumping, return flow obligations, etc. and accretions from recharge operations.

6. A **net impact** summary must show the out-of-priority depletions, accretions from each recharge site, volume of replacement water actually delivered to the location of the depletions and the resultant net impact on **a daily basis**. If necessary, the net impact must be done by river reach.

   While **modeling** may use a **monthly step function** to determine the depletions from pumping and accretions from recharge, the monthly result must then be **divided by the number of days in the month** in order to **simulate a daily impact**, as water rights are administered on a daily and not monthly basis.

Replacement water must be provided such that the **daily net impact** (using the simulated daily numbers from the modeling) **is not negative**. If a well is out-of-priority for 15 days during a month, replacement must be made only for the 15 days the well is out-of-priority. The replacement must be made, however, on a daily basis as opposed to, for instance, making an aggregated release equal to the volume of the out-of-priority depletions. Likewise, the simulated daily accretion will only count toward replacing the depletion on the days the well is out-of-priority. The accretions that report to the river when the well is in priority cannot be used to replace the out-of-priority depletions.

The **accretions that impact the river when the well is in priority** are not considered "excess" unless the cumulative net impact of the well is not negative for the entire irrigation year to date. (The irrigation year for this purpose is April 1 thru the following March 31.) Until such time as the cumulative net impact is not negative, the accretions must simply be released to the river and cannot be leased to other plans or recaptured. Plans that show a positive cumulative net impact are still required to make replacements on a daily basis; the cumulative analysis only effects whether or not accretions reporting to the river when the well is in priority are considered "excess" and are, therefore, able to be recaptured.

7. The basis for determining that the depletions are **out-of-priority** must be clearly established and all steps in the calculation included in the accounting. The analysis may be done, unless otherwise limited by decree, for each well or groups of wells, provided the most junior water right associated with the group of wells is used as the reference water right for the group's out-of-priority status.

8. Accounting must include **actual information** for the irrigation year through the month for which the accounting is being submitted **AND projections** of the plan operation through March 31 of the next calendar year.

9. The following **naming convention** must be used for all files submitted pursuant to item 1:

   "Plan**WDID**_YYMMDD"

   where: PlanWDID is the WDID assigned by the division engineer's office
   YYMMDD corresponds to the date the accounting is submitted.

   As an example, the assigned WDID for the former GASP plan was 0103333. If accounting using Excel® was submitted for that plan on May 15, 2004, the file name would be:

   "0103333_040515.xls"

   The name of the file must be in the subject line of the email.

10. All accounting must be reported using the **WDID** for the structure, at a minimum. Other information such as well name, permit number, etc. may also be included as desired. <u>All wells must be decreed by the water court, permitted by the state engineer or included in a decreed plan for augmentation</u>. Unregistered and undecreed wells cannot, in the opinion of the division engineer, be effectively administered because of the need to know the location, allowable diversion rate and use of the well - information that is only available from the decree or permitting process.

11. If a well is covered in multiple SWSP's or augmentation plans, the monthly meter readings must be the same in the accounting for each plan covering the subject well. The accounting for every plan covering the well shall state the proportionate pumping amount covered by each plan to assure all out-of-priority depletions are replaced.

12. The following additional accounting is required for sources of replacement water used for more than one plan. The water right owner of the replacement water is responsible for accounting for the total replacement amount and how much each plan is using of that total amount. The accounting for portions of the replacement water by other users must match the accounting of the water right owner. The amount of replacement water used by the water right owner and other users together shall not exceed the total replacement amount available.

    (See *Administration Protocol – Use Of Unnamed Sources For Replacement* for additional requirements concerning required notice and approval of sources of replacement not specifically described in a SWSP or augmentation plan*)*