

MINERALS PROGRAM INSPECTION REPORT PHONE: (303) 866-3567

The Division of Reclamation, Mining and Safety has conducted an inspection of the mining operation noted below. This report documents observations concerning compliance with the terms of the permit and applicable rules and regulations of the Mined Land Reclamation Board.

MINE NAME:	MINE/PROSPECTING ID#:	MINERAL:	COUNTY:
Boettcher Limestone Quarry	M-1977-348	Limestone (general)	Larimer
INSPECTION TYPE:	INSPECTOR(S):	INSP. DATE:	INSP. TIME:
Monitoring	Amy Eschberger, Patrick Lennberg,	January 30, 2020	10:30
	Michael Cunningham, and Russ Means		
OPERATOR:	OPERATOR REPRESENTATIVE:	TYPE OF OPERAT	ION:
Holcim (US) Inc.	Travis Bennett and Mike Toelle	112c - Construction R	egular Operation

BOND CALCULATION TYPE:	BOND AMOUNT:
None	\$2,518,261.30
POST INSP. CONTACTS:	JOINT INSP. AGENCY:
None	None
INSPECTOR'S SIGNATURE:	SIGNATURE DATE:
Commence Santoniana	February 28, 2020
Unit character	
	None POST INSP. CONTACTS: None

The following inspection topics were identified as having Problems or Possible Violations. OPERATORS SHOULD READ THE FOLLOWING PAGES CAREFULLY IN ORDER TO ASSURE COMPLIANCE WITH THE TERMS OF THE PERMIT AND APPLICABLE RULES AND REGULATIONS. If a Possible Violation is indicated, you will be notified under separate cover as to when the Mined Land Reclamation Board will consider possible enforcement action.

INSPECTION TOPIC: Hydrologic Balance

PROBLEM #1: The Division has no evidence the operator has a valid well permit, substitute water supply plan, or approved water augmentation plan for the exposed groundwater and/or impounded runoff observed at the site. This is a problem pursuant to C.R.S. 34-32.5-116(4)(h) and Rule 3.1.6(1)(a) which require the operator to comply with applicable Colorado water laws and regulations governing injury to existing water rights.

CORRECTIVE ACTIONS: By the corrective action date, the operator shall demonstrate the operation is in compliance with the Office of the State Engineer (SEO), show evidence the operator is taking measures to bring the site into compliance with the SEO, or backfill the pits to at least two feet above the water surface. If, by the corrective action date, the operator has not submitted the required corrective action, the reclamation bond for the site will need to be re-evaluated to include costs for backfilling the ponded water.

CORRECTIVE ACTION DUE DATE: April 28, 2020

INSPECTION TOPIC: Hydrologic Balance

PROBLEM #2: The groundwater monitoring data for the site shows several parameters exceeding Table Value Standards set by the Water Quality Control Commission's (WQCC) Regulation No. 41, which apply to this

unclassified area. This is a problem pursuant to C.R.S. 34-32.5-116(4)(h) and Rule 3.1.6(1)(b), which require disturbances to the prevailing hydrologic balance of the affected land and of the surrounding area and to the quantity and quality of water in surface and groundwater systems both during and after the mining operation and during reclamation be minimized, including compliance with applicable federal and Colorado water quality laws and regulations such as statewide water quality standards and site-specific classifications and standards adopted by the WQCC.

CORRECTIVE ACTIONS: By the corrective action date, the operator shall submit a Technical Revision, with the applicable fee, to revise the groundwater monitoring program to include proposed point(s) of compliance in accordance with Rule 3.1.7(6) and (7) at some distance hydrologically downgradient from the Cement Kiln Dust (CKD) disposal areas. Due to the lack of ambient groundwater quality data for the site required by Rule 3.1.7(b)(viii), the revision shall also include proposed background monitoring well(s) located outside of the CKD disposal areas and screened across similar lithological units as existing downgradient monitoring wells and the proposed compliance well(s). The information obtained from these wells will be used to evaluate protection afforded groundwater quality and compliance with groundwater standards.

CORRECTIVE ACTION DUE DATE: April 28, 2020

OBSERVATIONS

This inspection of the Boettcher Limestone Quarry (Permit No. M-1977-348) was conducted by Amy Eschberger, Patrick Lennberg, Michael Cunningham, and Russ Means of the Division of Reclamation, Mining and Safety (Division). The operator was represented by Mike Toelle and Travis Bennett during the inspection. The site is located approximately 1.5 miles north of LaPorte, CO in Larimer County. The site can be accessed from the south off County Road 21C. **Photos 1-26** taken during the inspection are included with this report.

Operation Summary:

This is a 112c operation permitted for 862 acres (see enclosed Google Earth images of the site) to mine limestone for use in the operator's nearby cement plant. Pre-law mining activities occurred at the site. A dragline was used to remove the material in stratigraphic layers or bands defined by their chemical characteristics. This mining method left a series of deep, elongated pits at the site oriented generally north-south. Salvaged overburden was piled along the edges of the pits.

Cement kiln dust (CKD) was generated on site during operations that occurred from the early 1900s through 2002. According to the operator, disposal of CKD in mined out portions of the quarry occurred from 1980 through 2002 (in the southern half of the site). CKD was initially placed in the Dry Fill CKD area. Per the Division's approval of Technical Revision No. 3 (TR-3) in 1999, CKD disposal was to be limited to the A2 areas, located north of the Dry Fill CKD area. Approximately 140,000 cubic yards of CKD was placed in the A2 disposal areas between 1999 and 2002. Mining and plant operations ceased at the site in 2002. The site has been in various stages of reclamation since that time.

The approved post-mining land use for the site is dry rangeland. The reclamation plan calls for grading disturbed land to slope gradients of 2H:1V or flatter, replacing up to 8 inches of topsoil, and seeding the land with a native grass seed mixture. The CKD disposal areas are to be covered with a minimum of 1.5 feet of overburden, graded for positive drainage, covered with 6-12 inches of growth medium, and seeded with the same grass seed mixture. Pre-law disturbed areas, including overburden stockpiles and previously mined Aband pits in the western portion of the permit area, will not require reclamation grading and revegetation if they are not re-disturbed by the operation. The access road that runs generally north-south across the site will remain.

It should be noted, the Division approved Technical Revision No. 8 (TR-8) on February 16, 2018 to allow geotechnical investigations to be conducted at the site to support the proposed realignment of Hwy 287 (through the permit area) as part of the Glade Reservoir Project. The approved reclamation plan for the site does not include the proposed highway realignment project. Therefore, prior to commencing with any construction activities associated with this project (beyond what was approved in TR-8), the operator will need to submit the appropriate permit revision to revise the reclamation plan and map accordingly.

Reclamation Status:

All reclamation earthwork has been completed at the site. The final slope configurations of the elongated strip pits appear to be stable. Additionally, reclamation vegetation is establishing well across the site, especially in the northern half of the permit area. Portions of the pre-law overburden stockpiles stored along the western edge of the permit area and the eastern pit walls of the pre-law A-pits located in the western portion of the permit area, have slopes steeper than 2H:1V with little to no vegetative cover. Because these areas were not redisturbed by the operation, they will not require reclamation. Much of the site has been reclaimed in accordance with the approved reclamation plan and could be released if not for the hydrologic balance issues described below. The northern portion of the permit area (north of the pits with ponded water) could be released from the

permit area at this time.

After the inspection, on February 24, 2020, an Acreage Reduction request (AR-4) was filed with our Office to release the northern 411 acres from the permit area. This request is currently under review by the Division. The 15-day public comment period for AR-4 will close on March 12, 2020.

Hydrologic Balance (Ponded Water):

The Division observed water ponded in three of the pits located along the western edge of the permit area (Ponds A, B3, and B) and in two of the pits located along the eastern edge of the permit area (Ponds 2 and C). The operator estimates the ponded water in the pits to be approximately 15 feet deep. Pond B2 located in the western portion of the permit area was dry during the inspection. The Division of Water Resources (DWR) requires operators to ensure water is not retained on site for more than 72 hours, unless an augmentation plan approved by water court is obtained. An augmentation plan must also be obtained for any exposed groundwater, unless an exemption has been approved by DWR.

The Division cited a problem for the ponded water in its last inspection report, sent to the operator on June 7, 2018. The Division approved a series of extension requests for this corrective action, the last of which gave a corrective action date of April 5, 2019. At that time, the operator indicated they had agreed to the terms of a long-term water lease agreement with the City of Greeley, which their Board would consider at its February 20, 2019 meeting. Assuming the Board agreed with the terms of the lease, the operator would begin drafting an augmentation plan for submittal to DWR. The Division has received no further information on this matter since the last extension request was approved in February of 2019.

During the current inspection, the operator indicated a proposed plan for augmentation for the site was sent to DWR approximately two weeks ago, and the operator is awaiting their response. The Division has not received any documentation proving the plan for augmentation was submitted to DWR.

A problem is cited in this report (see page 1) for the ponded water on site pursuant to C.R.S. 34-32.5-116(4)(h) and Rule 3.1.6(1)(a) which require the operator to comply with applicable Colorado water laws and regulations governing injury to existing water rights. The operator will need to demonstrate the operation is in compliance with the Office of the State Engineer (SEO), show evidence the operator is taking measures to bring the site into compliance with the SEO, or backfill the pits to at least two feet above the water surface. If, by the corrective action date, the operator has not submitted the required corrective action, the reclamation bond for the site will need to be re-evaluated to include costs for backfilling the ponded water.

Hydrologic Balance (Groundwater Monitoring Program):

The operation monitors groundwater at the site from a total of seven monitoring wells (MW-1 – MW-7), with all but one (MW-5) located near or downgradient of the CKD disposal areas in the southern portion of the permit area. MW-5 was installed in overburden outside (and north) of the CKD disposal areas. The Division collected GPS data for all well locations during the inspection (see enclosed Google Earth images of site). All wells were properly secured with padlocks. It should be noted, the concrete apron around well MW-1 is elevated above the ground by approximately 8 inches. Depending on the competence of the surface seal of the well, having the apron raised above the ground surface could allow water to migrate down the casing and into the well. Therefore, the Division recommends the operator install a proper concrete apron around well MW-1.

Monitoring wells MW-1 - MW-4 were installed in 1998 and 1999. Monitoring wells MW-5 - MW-7 were installed in late 2012. A total of 8 (bi-monthly) groundwater monitoring samples were collected from wells MW-1

1 – MW-4 for the period of April/May of 1999 through July of 2000. After the July 2000 sampling event, approximately 10 years passed before these wells were sampled again, in September of 2010. Somewhat regular sampling of these wells picked back up in March of 2011. The three additional monitoring wells installed in 2012 (MW-5 – MW-7) have been regularly monitored since 2013. The required monitoring (and reporting) frequency for the groundwater program was reduced from quarterly to semi-annually through Technical Revision No. 7 (TR-7), approved in 2016. This was to allow for complete recharge between sampling events, so that true independent measurements are collected based on groundwater equilibrium conditions.

The available groundwater monitoring data does not show consistent sampling for all parameters. While some of these inconsistencies are not explained in the permit record, the inconsistencies that occurred after August of 2014 can be attributed to the Division's approval of Technical Revision No. 6 (TR-6), which reduced the required monitoring parameters for the site. In 2018, the Division required the operator to expand the sampling suite to include all applicable parameters from the Table Value Standards established by the WQCC's Regulation No. 41, and to begin comparing parameter values to the most restrictive Table Value Standards rather than to any calculated values that may have been used previously. These changes were approved in Technical Revision No. 9 (TR-9) on October 26, 2018. Two (semi-annual) sampling events have occurred at the site since TR-9 was approved.

Since the last inspection, the Division has had on-going discussions with the operator and the Colorado Department of Public Health and Environment (CDPHE), Water Quality Control Division (WQCD) regarding the groundwater monitoring program for this unclassified area, including the application of WQCC's Regulation No. 41.5(C)(6) to the site. Per this regulation, sites with unclassified groundwater shall maintain groundwater quality at whichever is less restrictive: existing ambient quality as of January 31, 1994, or that quality which meets the most stringent criteria set forth in Tables 1 through 4 of "The Basic Standards for Ground Water" (Table Value Standards). The Division, as an implementing agency, is authorized to exercise its best professional judgement as to what constitutes adequate information to determine or estimate existing ambient quality, taking into account the location, sampling data, and quality of all available data. Data generated subsequent to January 31, 1994 shall be presumed to be representative of existing quality as of January 31, 1994, if the available information indicates that there have been no new or increased sources of groundwater contamination initiated in the area in question subsequent to that date.

The operator submitted Technical Revision No. 10 (TR-10) on March 5, 2019 to provide information that would allow ambient conditions to be established for the site based on groundwater monitoring data generated subsequent to January 31, 1994. Through the adequacy review process for TR-10, the Division identified deficiencies in the information presented which the operator was unable to adequately address. The operator requested withdrawal of TR-10 on December 13, 2019.

The following facts must be considered regarding groundwater quality conditions at the site:

- 1) Groundwater sampled from the site shows exceedances of WQCC's Table Value Standards for the following parameters: Arsenic, Barium, Boron, Chloride, Fluoride, Gross Alpha, Iron, Manganese, Nitrate as N, Nitrate + Nitrite as N, Selenium, Sulfate, Thallium, Uranium, and TDS > 10,000 mg/L (no background TDS available).
- 2) The operator was unable to adequately demonstrate (through TR-10) existing groundwater quality at the site is representative of ambient conditions.
- 3) Rule 3.1.7(6)(a) states in order to evaluate protection afforded groundwater quality, comply with groundwater standards, or to demonstrate compliance with permit conditions established by the Division

to protect groundwater quality, <u>one or more points of compliance shall be established</u>. Section (i) of this Rule specifies where the WQCC has not established standards, any permit condition established by the Division to protect groundwater quality shall be demonstrated to be met at <u>points of compliance</u> or as specified in the approved permit.

- 4) Rule 3.1.7(7)(b) states if groundwater monitoring is required, the operator shall include the following information as part of a permit application or permit modification to an existing permit:
 - (i) a map that accurately locates all proposed groundwater sample points and any locations that are proposed as a point of compliance;
 - (ii) the method of monitoring well completion where monitoring wells are required;
 - (iii) method of sampling, frequency of sampling and reporting to the Office;
 - (iv) parameters analyzed, water quality analysis methods, and quality control and quality assurance methods;
 - (v) formations, aquifers or strata to be sampled;
 - (vi) identify the potential sources of groundwater contamination that will be monitored by each point of compliance monitoring point;
 - (vii) a time-schedule for implementation; and
 - (viii) <u>ambient groundwater quality data</u> sufficient to characterize potentially impacted groundwater quality.
- 5) The groundwater monitoring program for the site does not include points of compliance or ambient groundwater quality data.
- 6) In order for the Division to evaluate protection afforded groundwater quality and compliance with groundwater standards, point(s) of compliance must be established at the site.
- 7) In lieu of ambient groundwater quality data, adequate background well(s) must also be established at the site

A problem is cited in this report (see pages 1 and 2) pursuant to C.R.S. 34-32.5-116(4)(h) and Rule 3.1.6(1)(b), which require disturbances to the prevailing hydrologic balance of the affected land and of the surrounding area and to the quantity and quality of water in surface and groundwater systems both during and after the mining operation and during reclamation be minimized, including compliance with applicable federal and Colorado water quality laws and regulations such as statewide water quality standards and site-specific classifications and standards adopted by the WQCC.

The operator will need to submit a Technical Revision (see enclosed form), with the applicable fee, to revise the groundwater monitoring program to include proposed point(s) of compliance in accordance with Rule 3.1.7(6) and (7) at some distance hydrologically downgradient from the Cement Kiln Dust (CKD) disposal areas. Due to the lack of ambient groundwater quality data for the site required by Rule 3.1.7(b)(viii), the revision shall also include proposed background monitoring well(s) located outside of the CKD disposal areas and screened across

PERMIT #: M-1977-348 INSPECTOR'S INITIALS: AME INSPECTION DATE: January 30, 2020

similar lithological units as existing downgradient monitoring wells and the proposed compliance well(s). The information obtained from these wells will be used to evaluate protection afforded groundwater quality and compliance with groundwater standards.

This concludes the report.

Any questions or comments regarding this inspection report should be forwarded to Amy Eschberger at the Colorado Division of Reclamation, Mining and Safety, 1313 Sherman Street, Room 215, Denver, CO 80203, via telephone at 303-866-3567, ext. 8129, or via email at amy.eschberger@state.co.us.

PHOTOGRAPHS



Photo 1. View looking south from northern permit boundary across reclaimed northern portion of permit area.



Photo 2. View looking southwest across reclaimed northern portion of permit area.



Photo 3. View looking west across reclaimed northern portion of permit area.



Photo 4. View looking west across reclaimed northern portion of permit area, showing pre-law western slope (indicated) which was not re-disturbed by the operation and therefore does not require reclamation.



Photo 5. View looking west across reclaimed northern portion of permit area. Note herd of pronghorn present on site, in background (circled).



Photo 6. View looking west across reclaimed northern portion of permit area.



Photo 7. View looking west across Pond A located in western portion of permit area, west of main access road. Note this pit was holding water during the inspection.



Photo 8. View looking southeast across Pond 2 located in eastern portion of permit area, east of main access road. Note this pit was holding water during the inspection.



Photo 9. View looking north across Pond B3 located in western portion of permit area, west of main access road. Note this pit was holding water during the inspection.



Photo 10. View looking south across Pond B2 located in western portion of permit area, west of main access road. Note this pit was dry during the inspection.



Photo 11. View looking northeast across Pond C located in eastern portion of permit area, east of main access road. Note this pit was holding water during the inspection.



Photo 12. View looking west at Poudre Valley Canal which crosses southern portion of permit area, separating CKD disposal areas to the south from rest of permit area.



Photo 13. View looking south across Pond B located in western portion of permit area, west of main access road. Note this pit was holding water during the inspection.



Photo 14. View looking south, showing monitoring well MW-5 located outside of CKD disposal areas, just north of Pond B. The well cap was secured with a padlock.



Photo 15. View looking east, showing monitoring well MW-2 located at northeastern edge of A2 CKD disposal area. The well cap was secured with a padlock.



Photo 16. View looking northwest, showing monitoring well MW-1 located within A2-A CKD disposal area, on top of small overburden mound (circled).



Photo 17. View looking south, showing monitoring well MW-1 located within A2-A CKD disposal area on top of small overburden mound. The well cap was secured with a padlock. However, the concrete apron around the well was elevated ~ 8 inches off the ground which could allow water to migrate down the casing and into the well. This needs to be repaired.



Photo 18. View looking south across reclaimed A2-A CKD disposal area (from top of mound with monitoring well MW-1).



Photo 19. View looking northeast, showing monitoring well MW-3 located at eastern edge of A2-A CKD disposal area. The well cap was secured with a padlock.



Photo 20. View looking northwest across southern portion of reclaimed A2-A CKD disposal area. Note pre-law overburden stockpile along western edge of pit (at left).



Photo 21. View looking northwest across northern portion of reclaimed Dry Fill CKD disposal area. Note surface of Dry Fill CKD disposal area ~30-40 feet higher than surface of A2-A CKD disposal area (indicated in background).



Photo 22. View looking south across central portion of reclaimed Dry Fill CKD disposal area.



Photo 23. View looking north, showing monitoring well MW-4 located southeast of Dry Fill CKD disposal area. The well cap was secured with a padlock.



Photo 24. View looking southeast from top of Dry Fill CKD disposal area, showing monitoring well MW-4 (circled) located downgradient from this disposal area.



Photo 25. View looking south, showing monitoring well MW-7 located east of Dry Fill CKD disposal area, near main access road. The well cap was secured with a padlock.



Photo 26. View looking south, showing monitoring well MW-6 located east of A2-A CKD disposal area, near main access road. The well cap was secured with a padlock.

GENERAL INSPECTION TOPICS

The following list identifies the environmental and permit parameters inspected and gives a categorical evaluation of each

(AR) RECORDS <u>N</u>	(FN) FINANCIAL WARRANTY <u>N</u>	(RD) ROADS <u>Y</u>
(HB) HYDROLOGIC BALANCE(2) PBs	(BG) BACKFILL & GRADING <u>Y</u>	(EX) EXPLOSIVES <u>N</u>
(PW) PROCESSING WASTE/TAILING <u>N</u>	(SF) PROCESSING FACILITIES N	(TS) TOPSOIL <u>N</u>
(MP) GENL MINE PLAN COMPLIANCE- <u>Y</u>	(FW) FISH & WILDLIFE \underline{N}	(RV) REVEGETATION <u>Y</u>
(SM) SIGNS AND MARKERS <u>Y</u>	(SP) STORM WATER MGT PLAN N	(RS) RECL PLAN/COMP <u>Y</u>
(ES) OVERBURDEN/DEV. WASTE <u>N</u>	(SC) EROSION/SEDIMENTATION \underline{Y}	(ST) STIPULATIONS <u>N</u>
(AT) ACID OR TOXIC MATERIALS <u>N</u>	(OD) OFF-SITE DAMAGE <u>N</u>	

Inspection Contact Address

Travis Bennett Holcim (US) Inc. 14500 CR 1550 Ada, OK 74820

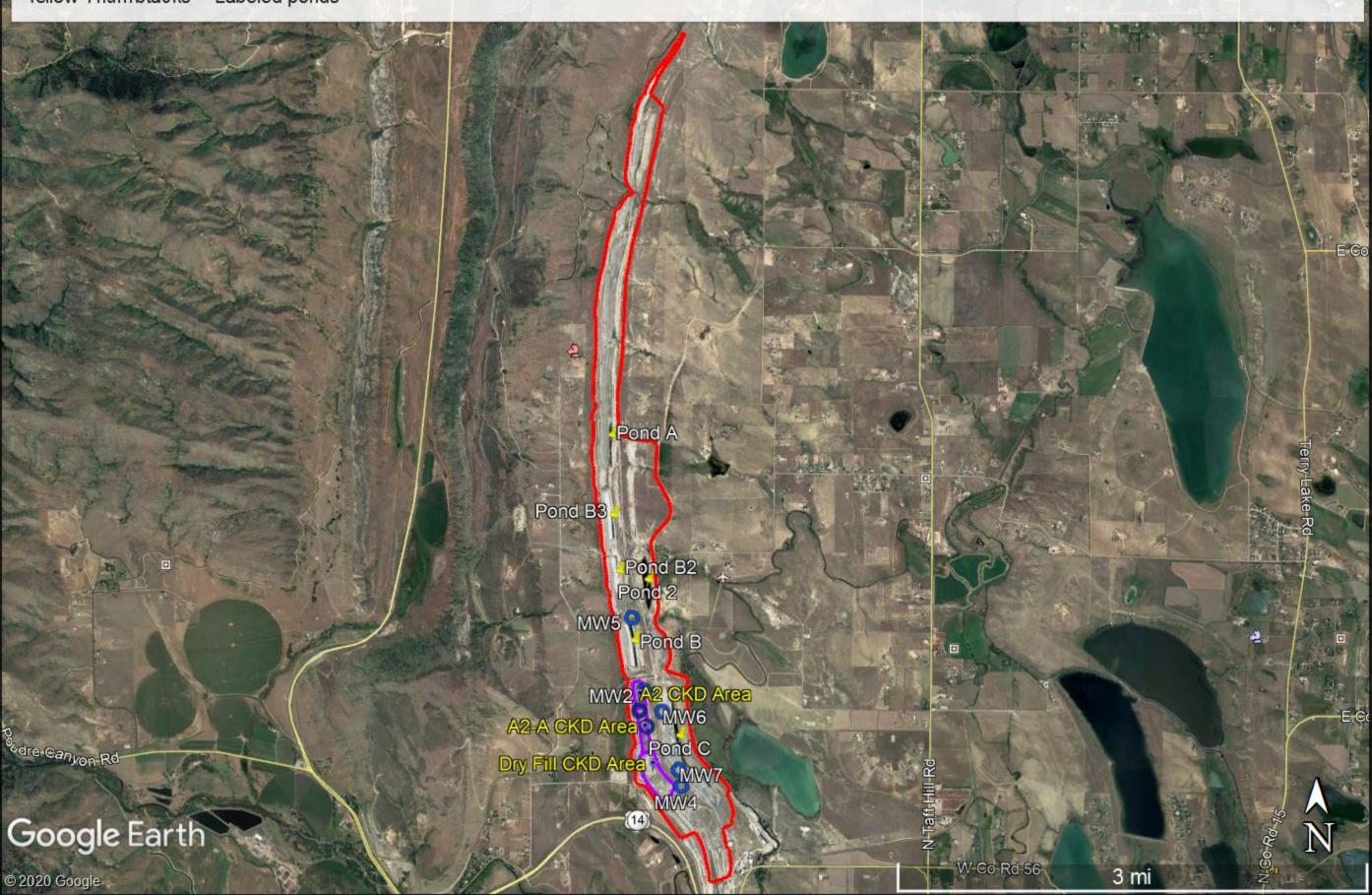
Encls: Google Earth image of site showing entire approved permit area
Google Earth image of site showing closer view of southern portion of site where groundwater
monitoring wells and CKD disposal areas are located
Technical Revision form

EC: Travis Bennett, Holcim (US) Inc. at: travis.bennett@lafargeholcim.com
Mike Toelle, Holcim (US) Inc. at: mike.toelle@lafargeholcim.com
Sara Harkins, Golder Associates, Inc. at: sara_harkins@golder.com
Patrick Lennberg, DRMS at: patrick.lennberg@state.co.us
Michael Cunningham, DRMS at: michaela.cunningham@state.co.us
Russ Means, DRMS at: russ.means@state.co.us

Y = Inspected and found in compliance / N = Not inspected / NA = Not applicable to this operation / PB = Problem cited / PV = Possible violation cited

M1977-348 / Boettcher Limestone Quarry / Holcim (US) Inc. (Image data from 7/17/2019)

Red Outline = 862 acres = Approved permit area (location approximated based on approved permit maps)
Purple Outline = Approximate location of CKD disposal areas (labeled A2, A2-A, and Dry Fill)
Blue Circles = Location of groundwater monitoring wells (MW-1 through MW-7)
Yellow Thumbtacks = Labeled ponds



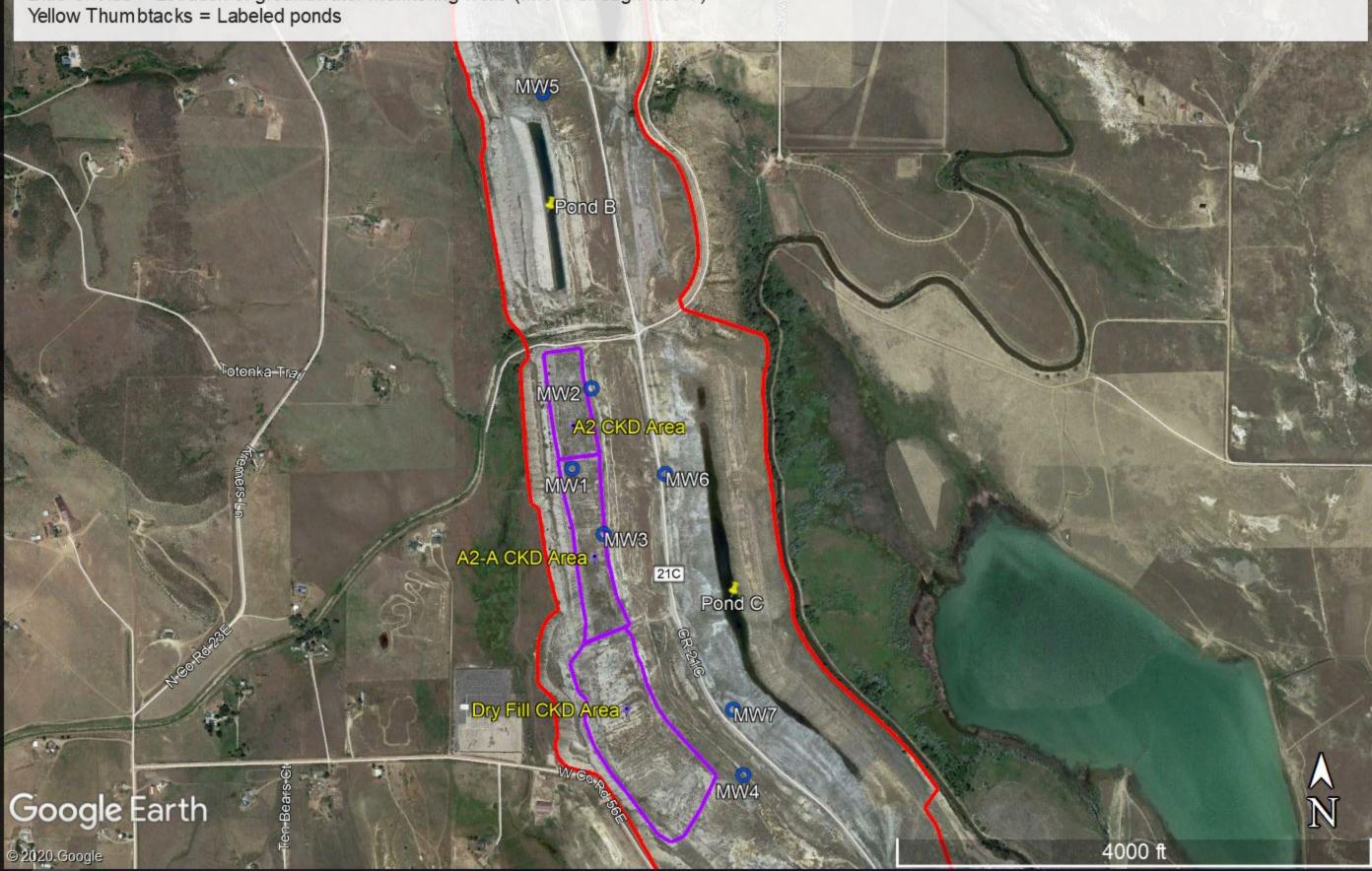
M1977-348 / Boettcher Limestone Quarry / Holcim (US) Inc. (Image data from 7/17/2019)

Closer view of southern portion of site where groundwater monitoring wells and CKD disposal areas are located.

Red Outline = 862 acres = Approved permit area (location approximated based on approved permit maps)

Purple Outline = Approximate location of CKD disposal areas (labeled A2, A2-A, and Dry Fill)

Blue Circles = Location of groundwater monitoring wells (MW-1 through MW-7)





COLORADO DIVISION OF RECLAMATION, MINING AND SAFETY 1313 Sherman Street, Room 215, Denver, Colorado 80203 ph(303) 866-3567

REQUEST FOR TECHNICAL REVISION (TR) COVER SHEET

File No.: M-	Site Name:	
County	TR#	(DRMS Use only)
Permittee:		
Operator (If Other than Pern	nittee):	
Permittee Representative:		
Please provide a brief descri	ption of the proposed revision:	
which does not have more the Environmental Protection Planets this definition. If the the Division may require the to the permit.	Rules, a Technical Revision (TR) is: "a nan a minor effect upon the approved or lan." The Division is charged with dete Division determines that the proposed resubmittal of a permit amendment to me considered "filed for review" until the a	r proposed Reclamation or ermining if the revision as submitted revision is beyond the scope of a TR, ake the required or desired changes
Division (as listed below by expedite the review process. determine if it is approvable TR, you will be notified of s day review period there are	permit type). Please submit the appropriate After the TR is submitted with the appropriate within 30 days. If the Division requires specific deficiencies that will need to be still outstanding deficiencies, the Divisible lime, in writing, to provide the require	priate fee with your request to propriate fee, the Division will additional information to approve a addressed. If at the end of the 30 ion must deny the TR unless the
sufficient information to the	nat for the submittal of a TR; however, in Division to approve the TR request, in accurately depict the changes proposed	cluding updated mining and
Required Fees for Technical your request for a Technical	Revision by Permit Type - Please mark Revision.	k the correct fee and submit it with
Permit Type 110c, 111, 112 construction materials, and 112 quarries	Required TR Fee \$216	Submitted (mark only one)
112 hard rock (not DMO)	\$175	
110d, 112d(1, 2 or 3)	\$1006	