

Ebert - DNR, Jared <jared.ebert@state.co.us>

Lamb Lakes, M-2018-039, Adequacy Response 1 0f 2

William Schenderlein <bill@blueearthsolutions.net> To: "Ebert - DNR, Jared" <jared.ebert@state.co.us> Mon, Oct 15, 2018 at 9:03 AM

Jared – The adequacy response to comments submitted on September 11, 2018 is attached. The file size requires that I split the response in two e-mails

The full hard copy is being sent and you should get it tomorrow morning. Please call me with any questions or if you need additional information.

Bíll Schenderleín, P.E., CFM

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Lamb Lakes Adequacy Response 2018.10.15 w Attachments A-B.pdf 9235K



Ebert - DNR, Jared <jared.ebert@state.co.us>

Lamb Lakes, M-2018-039, Adequacy Response 2 0f 2

William Schenderlein <bill@blueearthsolutions.net> To: "Ebert - DNR, Jared" <jared.ebert@state.co.us> Mon, Oct 15, 2018 at 9:05 AM

Jared – e-mail 2 of 2

Bíll Schenderleín

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From: William Schenderlein Sent: Monday, October 15, 2018 9:03 AM To: 'Ebert - DNR, Jared' <jared.ebert@state.co.us> Subject: Lamb Lakes, M-2018-039, Adequacy Response 1 0f 2

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Lamb Lakes Adequacy Response 2018.10.15 Attachments C-D.pdf 11669K



October 15, 2018

Colorado Department of Natural Resources Division of Reclamation, Mining and Safety Attn: Mr. Jared Ebert 1313 Sherman Street; Room 215 Denver CO, 80203

RE: Response to Adequacy Review Comments for North Weld County Water District, Lamb Lakes, File No. M-2018-039

Dear Mr. Ebert:

The following discussion and attachments are submitted on behalf of our client, North Weld County Water District, in response to the Adequacy Review comments prepared by the Division of Reclamation, Mining and Safety (the Division) dated September 11, 2018 for the Lamb Lakes site Regular (112) Operation Reclamation Permit application. The information and discussion below address each comment as it was presented by the Division.

Rule 6.4.3 – Exhibit C – Pre-mining and Mining Plan Map(s) of Affected Lands

- 1. The topographic lines on Exhibits C-5, C-6, and F-1 have been corrected. Please see the revised exhibits in Attachment A.
- 2. The Fort Collins Irrigation Canal Ditch and Larimer and Weld Irrigation Ditch have been labeled on Exhibit C-6. Please see the revised Exhibit C-6 in Attachment A.

Rule 6.4.4 – Exhibit D – Mining Plan

3. According to the 1987 Home Office Pit Amendment by Sterling Sand & Gravel Company, topsoil and overburden was removed from the site during mining. The amendment suggests that the site originally consisted of approximately 1-foot of silty topsoil and from 1.5 to 3 feet of silty/sandy clay overburden. However, the amendment and other documents also indicate that only enough quality topsoil was stockpiled to replace an average of 8 inches during reclamation. Site observations confirm that a relatively thin layer of topsoil exists on the site.

The applicant shall salvage all available topsoil on-site, likely less than 8 inches, prior to additional mining and reclamation disturbances. It is assumed that significant quantities of overburden do not exist on-site. Overburden, or "weathered bedrock", which could have similar properties to the original clay overburden, may be encountered during additional excavation on the lake bottoms. Layers of decomposing organic material may also be encountered during lake dewatering and excavation. However, at this time the potential quantities of these materials are not known. If these materials are available, and

suitable as a growth medium, the materials may be used to supplement previously stockpiled topsoil and used during site reclamation.

Rule 6.4.5 – Exhibit E – Reclamation Plan

4. The reclamation sequence is anticipated to be from Lamb A, south through Lamb B and Lamb C. Pit dewatering and slurry wall construction will effectively occur concurrently. For each pit, the lake shall only be dewatered once slurry wall construction has been contracted and scheduled. The lake dewatering shall occur so that additional excavation, backfill, and side slope maintenance can be performed during or prior to slurry wall construction. From previous experience at the Treiber Lakes site (M-2011-049), it is anticipated that the reclamation process of dewatering, excavation, backfill, and slurry wall construction will take 2-3 months for each lake.

Rule 6.4.7 – Exhibit G – Water Information

5. Site-specific groundwater information for the property is limited. Available site-specific and other alluvial information and evaluations are included in the attached Hydrogeologic Evaluation (see Attachment B). The evaluation provides an assessment of historic baseline groundwater conditions, potential impacts from lake dewatering and slurry wall construction, and recommendations for a groundwater monitoring plan.

During lake dewatering, and prior to slurry wall construction, operations may affect groundwater systems hydraulically connected to the Cache la Poudre River. Replacement of river depletions to mitigate these impacts will be covered under the Substitute Water Supply Plan (SWSP) obtained from the Colorado State Engineer's Office (SEO). Additionally, a well permit for exposed groundwater in the proposed permit area has been, or will be, obtained from the SEO.

The dewatering also has the potential to impact alluvial groundwater wells near the site. A well permit application search of the SEO database was used to locate wells near the proposed permit area. The Water Resource Map (Exhibit C-6) illustrates existing recorded well permit applications within 600 feet of the proposed permit boundary. Although there may be other wells in the area, they are not recorded with the SEO. As stated in the application, it appears that many of the wells identified within 600-feet of the proposed permit boundary were historically associated with the lands that have been mined and no longer exist.

The Hydrogeologic Evaluation (Attachment B) suggests that significant dewatering impacts are not likely to extend much more than 650 feet from the edge of the dewatered lakes. With this impact assessment, there are few alluvial wells within the potential dewatering drawdown area to be affected. Additionally, the lakes are to be dewatered individually and only immediately prior to slurry wall construction, minimizing the extent and duration of any potential dewatering impacts.

Dewatering also has the potential to impact the Fort Collins Irrigation Canal Ditch. As described in the Hydrogeologic Evaluation (Attachment B), impacts to the Larimer and Weld Irrigation Ditch from site dewatering is unlikely due to the presence of the Cache la Poudre River. The river is assumed to be in direct hydraulic connection with the alluvial aquifer and dewatering impacts are not expected to extend east of the river. To minimize impacts to Fort Collins Irrigation Canal Ditch irrigation water, dewatering operations shall not be performed during the irrigation season when irrigation flows could be affected by pit dewatering. The irrigation season is generally considered to be May through September, but the applicant will coordinate the construction schedule with the ditch owner. Agreements are also being discussed with the ditch owner (Arthur Ditch Company) to protect the owner from potential impacts.

Although operations at the Lamb Lakes site are not anticipated to injuriously affect surrounding water rights, it is the operator's intent to operate responsibly and to mitigate damage to wells or structures that is directly attributable to mining or reclamation. A groundwater monitoring program shall be implemented to establish baseline groundwater conditions and to evaluate changes in groundwater elevation and gradient during lake dewatering and slurry wall construction. If impacts are experienced due to lake dewatering, these affects should be temporary and discontinue once dewatering operations cease and/or the slurry walls are constructed. However, if dewatering from the proposed permit area directly affects the ability of surrounding wells to pump, or canals/ditches to deliver, a full supply of water in accordance with their permitted uses, the operator will take all necessary actions to remedy the affects to the extent they were directly caused by operations at the site. Mitigation measures may include, but are not limited to:

- 1. Modify existing wells to operate under lower groundwater conditions. This would include re-drilling existing wells to deeper depths or lowering the pumps. All work would be done at the operator's expense with the exception of replacing equipment that was non-functional prior to mining.
- 2. If existing wells cannot be repaired, the applicant will drill a new well for the owner to replace the damaged well. The new well will produce water of the same quantity and quality to support the historic use.
- 3. Provide an alternative source of water to support the historic well or canal/ditch water use during mine dewatering.
- 6. Significant groundwater mounding and shadowing is not anticipated outside the Lamb Lakes property. The Hydrogeologic Evaluation (Attachment B) describes potential affects from slurry wall construction at the site and impacts from mounding and shadowing. Due to the localized nature of mounding and shadowing and the adjacent land forms and uses, impacts from mounding and shadowing are not expected. However, a groundwater monitoring program shall be implemented to establish baseline groundwater conditions and to evaluate changes in groundwater elevation and gradient following slurry wall installation.

7. The Lamb Lakes Groundwater Monitoring Plan shall be established, incorporating the recommendations presented in the Hydrogeologic Evaluation (Attachment B). The recommendations include installation of eight monitoring wells, a minimum of 18 months baseline data collection prior to additional mining and reclamation activities, and a quarterly monitoring frequency. The monitoring plan shall be used prior to, during, and following mine operations and reclamation activities at the Lamb Lakes site and shall evaluate potential mining and reclamation impacts.

The monitoring plan shall include the installation of new alluvial wells or, if constructed appropriately, existing alluvial wells. The wells/piezometers shall be installed as soon as is practical so that baseline groundwater elevation data can be collected prior to new mining and reclamation activities. The monitoring plan, including details of well installation and surveyed well locations and elevations, shall be submitted to the Division. Additionally, once baseline data has been collected and typical groundwater elevation fluctuations can be evaluated, elevations associated with potential impacts shall be established. The monitoring plan shall be updated with the baseline data evaluation and potential impact "trigger" elevations and submitted to the Division prior to new mining and reclamation activities. All routine monitoring data shall be provided to the Division during annual reporting.

- 8. The aquifer affected by the Lamb Lakes mining and reclamation activities is the Cache la Poudre alluvial aquifer. No other aquifers shall be affected by the operation.
- 9. Prior to dewatering and any mining or other site construction activities below the groundwater table, the site SWSP shall be updated with the SEO to cover all associated depletions.
- 10. Water consumed during mining and slurry wall construction activities will include evaporation from exposed groundwater in dewatering trenches and potential settling basins as well as additional operational water losses from dust control and water retained in mined material hauled off-site or placed above the groundwater table. Estimates are based on only one lake being dewatered and one slurry wall being constructed per year. According to initial estimates, the maximum annual consumptive use in the proposed permit area is 10.5 acre-feet. This depletion is based on approximately 3 acres of exposed groundwater area for dewatering trenches and settling basins and a net evaporative loss of approximately 2.6 acre-feet per year. If the moisture content of the material transported off-site or placed above the groundwater table is assumed to be 4 percent by weight, and the annual mined material from the pit bottom is estimated to be 200,000 tons per year, then the annual amount of water lost in material is approximately 5.9 acre-feet. It is also estimated that approximately 2 acre-feet of water will be needed annually for dust control during mining and reclamation activities. A new SWSP for evaporation and operational losses will be obtained from the SEO prior to any new activities below the groundwater table.

The replacement of consumptive uses will be accounted for in a new SWSP administered by the SEO. Sources of replacement water include reusable municipal return flows from the East Larimer County Water District. Additional sources of replacements may include water rights owned or leased by the City of Greeley or the Tri-Districts in the Cache la Poudre basin.

Rule 6.4.9 – Exhibit I – Soils Information

11. As described in the response to Adequacy Review Comment #3, it is believed that approximately 8 inches of topsoil was replaced following initial site mining and reclamation activities. It is also assumed that no significant overburden was replaced prior to topsoil placement. It is anticipated that only 4 to 6 inches of topsoil is recoverable from the majority of the site.

Rule 6.4.10 – Exhibit J – Vegetation

12. The 1987 Home Office Pit Amendment by Sterling Sand & Gravel Company indicates that revegetation of the Lamb Lakes Site included seeding upland areas with a mixture of Western wheatgrass, Switchgrass, Big bluestem, Inland saltgrass, Indian ricegrass, and Sand dropseed. The amendment also specifies that, in the moist, low lying areas adjacent to the ponds, revegetation would include Reed canarygrass, Inland saltgrass, Alkali sacaton, and Sand dropseed. In general grasses across much of the proposed Lamb Lakes site have become well established.

Although a detailed vegetation cover and identification study was not performed, an additional site investigation was performed in early October 2018 to better define vegetation on the site (see Attachment C). Further evaluation indicates that the major grasses populating uplands on the site are wheatgrasses, Big bluestem, and Smooth brome. Although Smooth brome was not included in the original reclamation seed mix, it was in the seed mixture used to stabilize soil stockpiles. In more moist areas, switchgrass, upland saltgrass, Alkali sacaton, and various species of rushes and sedges dominate. Mowing is still being used on-site and appears to have minimized growth of nuisance and unwanted weeds. Near the permit boundaries and lake edges, however, mowing is not performed and the grasses grow tall. Kochia is most prevalent adjacent to the unimproved roads where disturbance still occurs. In moist areas where mowing does not occur, sporadic thistle grow was observed.

Currently, the vegetation cover serves to stabilize slopes and lake shorelines. In areas that receive regular mowing, bunch grasses are more dense than in areas where mowing is not performed. However, with or without mowing, coverage appears to be from 30 to 40 percent in upland areas. In areas not covered by upland grasses, the ground is covered with a layer of organic detritus. In moist areas, vegetation cover is almost 100 percent. The exception areas are adjacent to, and on, the unimproved roads where rock and soil are still exposed. In upland areas, especially adjacent to the permit boundary, shrubs and

trees include Siberian elm, ash, and rabbit brush. Along the lake shore, cottonwoods, willow, and Russian olive are dominant.

Rule 6.4.19 – Exhibit S – Permanent Man-made Structures

13. Proof of offering structure agreements to all owners of man-made structures within 200 feet of the affect land is provided in Attachment D. However, not all adjacent property owners with structures have accepted the applicant's structure agreement offer. As structure agreements become finalized, they will be provided to the Division.

Since structure agreements could not be obtained from all structure owners within 200 feet of the affected area, slope stability shall be addressed prior to slurry wall construction. The lake cavities have been previously mined and reclaimed and no highwalls exist, nor will be created, on the site. According to the 1987 Home Office Pit Amendment by Sterling Sand & Gravel Company, the pits were mined to bedrock and reclaimed for wildlife habitat. To enhance the wildlife habitat, lake side slopes were reclaimed to 3H:1V slopes, with flatter 4H:1V slopes within five feet of the normal lake water surface. Wave erosion has altered the slopes slightly, but slopes below the water line appear to be 3H:1V or flatter as recommended by the Division for slope stability.

The existing reclaimed lake slopes have remained stable since reclamation was finalized. It is expected that even once the lakes are dewatered, the slopes will remain stable during slurry wall construction. Lake draw-down rates will be controlled to prevent slope failure during dewatering. Since the geotechnical properties of the slope material is not known, and the slopes are not available for sampling, a slope stability sensitivity analysis will be performed using typical slope backfill materials to guide lake draw-down rates. Once dewatered, the slope material will be sampled and evaluated for stability during slurry wall construction and reservoir operation. In addition to the slope material, the adjacent top of bank material will be sampled and evaluated for stability as part of slurry wall design.

The applicant believes that, in its current reclaimed condition, the property is stable. Even if failure of the lake slopes occurs during dewatering, with the bulk of existing slope material in place, slope failure would not extend to the original mining highwall or outside of the proposed permit boundary. Once dewatering is complete, material analyses and stability evaluations will be performed as part of the reservoir construction and the applicant commits to providing the analyses and evaluation results to the Division prior to construction.

Rule 1.6.2 – Notice Requirements

14. Proof of publication in newspaper is provided in Attachment C.

Mr. Jared Ebert RE: Lamb Lakes Site M-2018-039 October 15, 2018

15. Proof of notice to all owners of record of surface and mineral rights of affected land and surface owners and easement holders within 200 feet of the affected land is provided in Attachment D.

Proof of filing this adequacy review response and attachments with the Larimer County Clerk is attached.

If you have any questions regarding this application and adequacy comment responses, please call me directly at (970) 227-2803.

Sincerely, Blue Earth Solutions, LLC

William Schenderlein, P.E. Project Manager

Enclosures



Remarks:

Submission of this material satisfies requirements of the Mine Land Reclamation Board Regular 112 Operation Reclamation Permit Application. The enclosed application material must remain for public review at least sixty (60) days after a decision on said application has been made the Office of Mined Land Reclamation (Rule 1.6.2 (2)). Confidential materials were purposely excluded.

 One (1) copy of Adequacy Review Response Letter for DRMS application adequacy review comment letter dated September 11, 2018 – Lamb Lakes, M-2018-039 – North Weld County Water District

Signed: Will la

Attachment A

- Revised Exhibit C-5, Pre-mining and Mining Plan Map
- Revised Exhibit C-6, Water Resources Map
- Revised Exhibit F-1, Reclamation Plan Map







Attachment B

- Lamb Lakes Hydrogeologic Evaluation

HYDROGEOLOGIC EVALUATION LAMB LAKES

DIVISION OF RECLAMATION, MINING AND SAFETY PERMIT NO. M-2018-039

LARIMER COUNTY, COLORADO



Prepared for: North Weld County Water District 32825 County Road 39 Lucerne, Colorado 80646

October 2018



Blue Earth Solutions, LLC P.O. Box 2427, Fort Collins, CO 80522

HYDROGEOLOGIC EVALUATION LAMB LAKES Division of Reclamation, Mining and Safety Permit No. M-2018-039

LARIMER COUNTY, COLORADO

This report was prepared by me or under my direct supervision, and to the best of my knowledge is complete and correct. The Hydrogeologic Evaluation has been prepared in accordance with good engineering practices. I am a duly registered Professional Engineer under the laws of the State of Colorado.

This certification in no way relieves the owner or operator of the Lamb Lakes Site of his/her duty to fully implement the requirements of Permit No. M-2018-039 or other responsibilities in accordance with all applicable rules and regulations.



Will

William Schenderlein Project Engineer Blue Earth Solutions, LLC Colorado PE # 38161

HYDROGEOLOGIC EVALUATION FOR THE NORTH WELD COUNTY WATER DISTRICT LAMB LAKES SITE LARIMER COUNTY, COLORADO

1.0 INTRODUCTION

This evaluation provides a hydrogeologic assessment of the alluvial groundwater conditions across the Lamb Lakes Site (M-2018-039) project area. The evaluation has been prepared for submittal to the Colorado Division of Reclamation, Mining and Safety in response to adequacy review comments dated September 11, 2018.

The Lamb Lakes proposed permit area was historically mined for alluvial sand and gravel in three distinct mine areas and currently consists of three separate groundwater lakes; Lamb A, Lamb B, and Lamb C (**Figure 1**). Complete mining and reclamation of the proposed permit area will consist of lake dewatering, additional excavation, selected slope backfilling, and slurry wall construction. With final slurry wall construction, the historic mining areas will effectively be separated from the surrounding alluvial groundwater system, making the pits available for future below-grade water storage. Adjacent properties are primarily rural and semi-rural residential and agricultural uses. The Cache la Poudre River runs from northwest to southeast along the eastern boundary of the site. The Fort Collins Irrigation Canal Ditch diverts water from the Cache la Poudre River immediately north of the site and the ditch flows along the eastern and southern edges of the site. The Larimer and Weld Ditch also diverts water from north of the site, but the ditch diverts east of the river and flows away from the site.

This evaluation will address adequacy review comments related to Exhibit G, Water Information, of the Minerals Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials. Specifically, the evaluation provides (1) a hydrologic impact analysis to demonstrate the radius of influence of the dewatering operation for current and future mining and reclamation phases, (2) an estimation of the static groundwater elevation at the site assuming no dewatering, and (3) recommendations to be included in a groundwater monitoring plan.

2.0 HYDROGEOLOGICAL CHARACTERIZATION

The final mining and reclamation at Lamb Lakes will occur in three phases. Each of the three lakes will be individually dewatered during separate slurry wall construction periods. Prior to future lake dewatering and slurry wall construction, piezometers should be installed around the perimeter of the site to record baseline groundwater elevations. The piezometers should stay in place and be used to monitor fluctuations in groundwater elevations during and after slurry wall construction.

2.1 Regional Geologic Setting

The Lamb Lakes Site is located in the Colorado Piedmont Physiographic Province between the Southern Rocky Mountain Province to the west and the Great Plains Province to the east. The proposed permit area is located along the Cache la Poudre corridor and floodplain.



Figure 1. Lamb Lakes Site

The western most boundary of the Cache la Poudre basin originates at the Continental Divide in Rocky Mountain National Park and drains east through the Rocky Mountain Front Range foothills and into the relatively flat topography of eastern Larimer County. The Cache la Poudre River alluvium is reported to be fairly consistent on and near the site, generally ranging near 20 feet in thickness (Robson 2000).

The Quaternary age valley fill is composed of sand and gravel deposits of the Piney Creek and Post Piney Creek alluvium laid down by the river (Robson 2000). Drill logs from the property indicate that the alluvium is consistently between 15 and 25 feet thick and consists of unconsolidated clay, silt, sand, and gravel. The Cache la Poudre alluvium is underlain by relatively impermeable Pierre Shale bedrock of Cretaceous age. The shale is a thick sequence of clayey to silty marine shales containing fossils and local beds of limestone. Where not previously disturbed by mining or other activities, the alluvial deposits are covered by up to three



feet of clay overburden (Empire 1975). In undisturbed areas, as much as a foot of topsoil exists (Empire 1975). However, the historic mining and reclamation activities on the site have significantly influenced soil and overburden structure and depth.

Groundwater in the Cache la Poudre alluvium near the site generally has a saturated thickness less than 20 feet, is less than 10 feet below the land surface, and is under unconfined water table conditions (Robson 2000 and Empire 1975). The groundwater in the alluvium adjacent to the river represents a stream-aquifer system in which the groundwater and the surface water are in close hydraulic and hydrologic connection. The static water table fluctuates seasonally and year to year, but is generally no higher than the top of the alluvial sand and gravel deposit. The groundwater is tributary to the Cache la Poudre River and generally flows from west to east through the alluvium, parallel to and slightly towards the river (Robson 2000).

The Cache la Poudre River is used extensively for irrigated agriculture in the valley and on the adjacent lands. Water is supplied for irrigation by diversion of surface flow directly from the river and its tributaries through a network of irrigation canals and ditches. Pumping by shallow wells for domestic use and irrigation represents a principal source of alluvial groundwater depletion. The primary source of alluvial aquifer recharge is the river and its tributaries. Recharge to the alluvial aquifer also consists of infiltration of diverted ditch flows, applied irrigation water and deep percolation of precipitation. Water levels in the aquifer in close proximity to the river channel can be influenced by changes in stream flow over a short period of time, whereas water levels in the aquifer distant from the river are likely influenced by changes in stream flow over the long term and an overall increase in availability of surface water for irrigation.

2.2 Site Conditions

Information on the subsurface conditions for the project site was derived from site boring logs (Empire 1975) and associated sample analyses performed prior to the original mining activities. Additional subsurface, groundwater, and alluvial aquifer characteristics were obtained from published studies and reports prepared by federal and State water resource agencies. Selected reference material is provided in **Appendix A**. Records were also obtained from the Colorado Division of Water Resources, Office of the State Engineer (SEO) for site and nearby alluvial well information. Geotechnical information from slurry wall construction at the Treiber Lakes site was also used for alluvial characterization.

During the August 1975 geotechnical investigation (Empire 1975) exploration holes were drilled to define sand and gravel reserves for the mining and reclamation operation. The drilling included a total of 6 holes on or near the site. Applicable data from the report are summarized in **Table 1** and the report and other selected geotechnical information is provided in **Appendix B**. Although the 1975 exploration provides estimates of alluvial thickness and groundwater elevations, sieve analyses and other geotechnical evaluations were not available. Generally, however, the report describes the overburden as a damp clay containing varying amounts of silt and sand extending from 2.5 to 4 feet below the ground surface. The alluvial material is generally less than 20 feet thick, consists of well-graded sand and gravel with cobbles and boulders up to 18 inches in diameter (Empire 1975). Overall, the samples indicate that the characteristics of the alluvium are somewhat consistent across the site. The upper one-foot of the underlying claystone material is weathered, but the deeper material is described as firm (Empire 1975). This clay layer is interpreted to be the underlying Pierre Shale bedrock (Robson 2000).



The description of the material suggests that the bedrock behaves as an aquitard (low permeable barrier) for the overlying alluvial aquifer.

Bore Hole	Approximate Ground Surface Elevation (feet amsl)	Overburden Thickness (feet)	Approximate Groundwater Elevation (feet amsl)	Approximate Bedrock Elevation (feet amsl)	Saturated Thickness (feet)
No.1	5017	1	5011	5001	10
No.4	5017	4	5011	4993	18
No.5	5010	1	5001	4987	14
No.7	5016	3	5013	4998	15
No.8	5008	4	5005	4990	15
No.9	4998	4	4994	4977	17
Average		2.8			14.8
	ploration holes within La		-	st mining topogram	hy.

Table 1Summary of August 1975 Bore Hole Data

(2) Ground surface elevations estimated from Google Earth and post-mining topography

(3) amsl = above mean sea level

2.3 Alluvial Aquifer Characterization

The exploration borings and other available information were used to construct a conceptual hydrogeologic model of the site prior to the historic mining operations. For the purpose of characterizing the hydrogeologic conditions for the site, the subsurface materials can be subdivided into three units: a clay/sandy clay overburden, permeable unconsolidated sand and gravel, and low permeability bedrock. Bedrock is covered by alluvium throughout the property. In general, the thickness of the alluvium ranges from approximately 14 to 22 feet across the project site. Local fine-grained clay or silty clay zones occurring as laterally continuous beds within the alluvium are not apparent in the available exploration borings. Therefore, the subsurface information suggests that the alluvium can conceptually be considered one aquifer.

Unfortunately, data from the exploration borings or other available published reports does not provide specific information regarding seasonal or annual groundwater elevation fluctuations. Consistent with typical alluvial systems along the Colorado Front Range, it is likely that groundwater on the property is consistently at its lowest elevation during winter months. During the spring and summer months, possibly in response to recharge from high river runoff flows and agricultural irrigation, groundwater elevations would be expected to rise across the property to their highest elevations.

Groundwater elevations and average estimates of the alluvial saturated thickness taken from the site exploration data (Empire 1975) are consistent with values obtained from published data for the Cache la Poudre River (Robson 2000). Reference material (Robson 2000) suggests that the alluvial groundwater elevation across the site should be about 5000 feet above mean sea level (amsl) with annual and seasonal fluctuations of several feet and a saturated thickness of less



than 20 feet. Similarly, Robson (2000) suggest that the alluvial groundwater gradient is about 0.005 (0.5 feet decline per 100 feet of horizontal distance) from northwest to southeast across the site.

Groundwater information collected from the site exploration data (Empire 1975) indicates that the alluvial groundwater elevation on the site is between 4994 and 5013 amsl with a saturated thickness ranging from 10 to 17 feet and averaging about 15 feet. Based on results from the subsurface investigation, published reference material, and well data from the SEO database, typical groundwater elevations were estimated for the site and are presented as surface contours in **Figure 2**. The alluvial groundwater contours in **Figure 2** are considered typical, may not correlate exactly to the bore hole groundwater elevations collected at the time of the 1975 subsurface investigation, and would be expected to fluctuate seasonally by several feet.



Figure 2. Lamb Lakes – Pre-Mining Groundwater Table Estimate



Without specific geotechnical evaluations and sieve analyses from the site, information from the Treiber Lakes Site (M-2011-049) was used to estimate the hydraulic conductivity for the aquifer (Table 2). Geotechnical data, including grain-size distributions from the alluvial samples was collected at the Treiber Lakes Site (approximately one mile west of the Lamb Lakes Site) in 2012 for slurry wall construction (EnviroGroup 2012). Calculated hydraulic conductivity values from two different methods were used and, if applicable, compared. The Hazen Method (Fetter 1994) is a simple calculation relating the D10 size of the soil to hydraulic conductivity. The Beyer Equation (Kresic 2006) calculates hydraulic conductivity using the D10 particle size and uniformity coefficient of poorly sorted porous media. Results from the bore hole samples estimate that the hydraulic conductivity of the alluvium is between 9 and 64 feet/day.

Although published data for alluvial hydraulic conductivity is rare, a United States Geological Survey report (Schneider 1983) found hydraulic conductivities for the northern Front Range South Platte River alluvium and its tributaries (including the Cache la Poudre River) typically range from 15 to 300 feet/day. Additionally, during slurry wall construction at Treiber Lakes, the aquifer conductivity was estimated to be approximately 28 ft/day (Tetra Tech 2015). Records from the SEO for domestic and agricultural wells near the property generally indicate low yields during well construction, with saturated thicknesses of 10 to 15 feet and pumping rates of about 15 gallons per minute, suggesting a relatively low alluvial hydraulic conductivity.

Based on available information, a bulk hydraulic conductivity value of 30 feet/day was used for potential dewatering impact evaluations. This value is within the bulk hydraulic conductivity range provided by Schneider (1983) and is consistent with wells yields reported in SEO well construction documents.

Bore Hole	D10 ⁽¹⁾ (mm)	D50 ⁽²⁾ (mm)	D60 ⁽³⁾ (mm)	Uniformity Coeff. ⁽⁴⁾	Hydraulic Conductivity ⁽⁵⁾ (feet/day)
BH-1	0.15	1.3	2.1	14	64 51
BH-7	0.07	1.2	2.1	30	14 9
BH-9	0.10	2.1	3.5	35	28 17
 (2) 50% of the pa (3) 60% of the pa (4) Uniformity C 	articles in the articles in the oefficient =	e sample are e sample are D60/D10	smaller tha smaller tha	n this diameter. n this diameter. n this diameter. vity: Hazen Meth	od from Fetter 1994

Table 2 Summary of August 2009 Bore Hole Gradation Data (Miller 2009)

(top)/Bever Method from Kresic 2006 (bottom)



3.0 POTENTIAL DEWATERING IMPACTS

To estimate potential impacts from mine dewatering operations, the steady-state twodimensional analytical solution of Marinelli and Niccoli (2000) was used for each phase of the mine plan. The analytical solution estimates radial groundwater flow toward a circular pit and assumes that drawdown occurs within a homogeneous, isotropic aquifer of infinite extent. Other important assumptions include (1) groundwater flow is steady state, unconfined, horizontal, and radial, (2) recharge is uniformly distributed and captured within the radius of influence, (3) the aquifer extends significantly beyond the radius of influence, and (4) the base of the pit is coincident with the base of the aquifer and there is no flow through the pit bottom. Review of the site hydrogeologic characterization (Section 2) suggests that these assumptions are reasonably satisfied. Deviations from these assumptions are described in more detail below.

The analytical solution for groundwater saturated thickness in the aquifer adjacent to a mine dewatering operation is given as:

$$h = \sqrt{h_p^2 + \frac{W}{K_h} \left[r_i^2 \ln\left(\frac{r}{r_p}\right) - \left(\frac{r^2 - r_p^2}{2}\right) \right]}$$

where

- *h* is saturated thickness above the pit base at *r* (radial distance from pit center) [L],
- h_p is saturated thickness above the pit base at r_p (at the mine wall) [L],
- W is distributed recharge flux [L/T],
- K_h is horizontal hydraulic conductivity of surrounding geologic materials [L/T],
- r_i is radius of influence (maximum extent of the cone of depression) [L],
- *r* is radial distance from pit center [L],
- r_p is effective pit radius [L].

Given input values of h_p , W, K_h, r_p , and initial (pre-mining) saturated thickness above the pit base (h at r_i), the radius of influence (r_i) can be determined through iteration by setting r equal to r_i . Once r_i is determined, h can be calculated for any radial distance from the pit, and drawdown can be calculated as pre-mining h minus calculated h at r.

Key parameters in the analysis include the alluvial aquifer saturated thickness at the pit wall prior to dewatering impacts, hydraulic conductivity (K_h), and recharge (W). Pre-mining aquifer characteristics were discussed previously in Section 2, including an alluvial groundwater saturated thickness of 15 feet (h at r_i) and hydraulic conductivity of 30 feet/day (K_h). Additionally, it was assumed that the alluvial groundwater saturated thickness is drawn down to 2 feet at the pit wall (h_p at r_p) during dewatering.



Recharge flux within the radius of influence (W) was estimated based on annual precipitation (WRCC 2018) and inputs from irrigated agriculture (CSU 2009). Annual precipitation in the region averages 15.1 inches/year (WRCC 2018). With the majority of precipitation occurring during sporadic, high intensity thunderstorms, it was assumed that 20 percent contributes to alluvial groundwater recharge. The recommended average annual water need for grass pasture crops in the Longmont/Greeley area is about 26 inches/year (CSU 2009). Irrigation, therefore, must contribute 10.9 inches/year to make up for the precipitation deficit. Considering the soaking nature of irrigated agriculture, it was assumed that 50 percent of the irrigation water contributes to the aquifer recharge.

To estimate the potential dewatering impacts, the radius of influence was assumed to extend to a point where analysis results showed an alluvial groundwater drawdown of approximately 20 percent of the saturated thickness or 3 feet. This assumption is also reasonable considering groundwater elevation and saturated thickness can vary up to several feet seasonally.

Within the estimated radius of influence, obstructions will increase and decrease the affects of dewatering. To the northeast, the Cache la Poudre River borders the site boundary. It is assumed that the river is in direct connection with the alluvial groundwater and, therefore, continuous recharge from the river will significantly influence the affects of dewatering. Impacts from dewatering will not extend north or west of the river, and the radius of influence will be reduced immediately south and east of the river due to the increased recharge flux.

Alluvial aquifer saturated thickness and recharge are very important parameters in the analytical solution. In addition to assumptions made estimating the saturated thickness and input from recharge, these two parameters also vary seasonally and from year to year. Values for the parameters, however, are used in the analytical solution based on annual averages. Therefore, variability in these parameters will make observed impacts from the analytical solution differ seasonally and year to year. Additionally, affects from obstructions such as seasonal recharge from the river and irrigation canals such as the Fort Collins Irrigation Canal Ditch are not considered in the analytical solution. Considering all assumptions and parameter variability, it needs to be noted that results of the analytical solution should only be taken as a rough approximation of potential dewatering impacts and alluvial groundwater elevation monitoring is recommended to evaluate actual groundwater impacts.

For the Lamb Lakes dewatering analysis, it is assumed that only one lake will be dewatered at a time with each lake creating a circular pit with a radius of 600 feet. Based on available information and parameter assumptions, the unobstructed radius of influence was estimated to extend over 1300 feet beyond the outer-most cell wall with dewatering flows from the cells of almost 130 gallons per minute. However, if three feet of drawdaown from the existing groundwater surface is considered to be the significant affect, the significant radius of influence was estimated to be approximately 650 feet from the cell walls (**Figure 3**). Drawdown of the alluvial groundwater elevation is illustrated in **Figure 4** and the spreadsheet analysis results are included in **Appendix C**.

As discussed above, the drawdown affects will be reduced by the Cache la Poudre River recharge and drawdown affects will not extend north or west of the river. The result of these affects on the radius of influence has been estimated in **Figure 4**. Although **Figure 4** presents an estimate of potential dewatering impacts, alluvial groundwater elevation monitoring is recommended to evaluate actual impacts.





Figure 3. Estimated Groundwater Drawdown from Edge of Dewatered Lakes

4.0 POTENTIAL SLURRY WALL IMPACTS

Once a slurry wall liner is constructed around an existing groundwater lake, impacts to the adjacent groundwater table from lake surface evaporative losses and/or pit dewatering will cease. The lined reservoir will influence alluvial groundwater flow near the slurry wall, but these influences are typically localized. As described in Section 2, groundwater conditions at the Lamb Lakes property are generally similar to most alluvial aquifers along the Colorado Front Range; exhibiting significant transmissivity and low gradient. Groundwater flow is in the same direction as, and towards, the river (see **Figure 2**). The alluvial groundwater elevation and flow direction in these systems are typically influenced by fluctuations in river flow, direct precipitation and infiltration, agricultural irrigation, and withdrawals from water wells.

Mounding and shadowing refer to a slightly higher or lower normal groundwater elevation, respectively, and can be caused by obstructions to the natural alluvial groundwater flow regime. Once a slurry wall is complete, and based on the estimated groundwater flow regime, mounding is anticipated west and northwest, or upgradient, of the slurry walls and shadowing is expected east and southeast, or downgradient of the reservoirs. Although it is difficult to quantify exact elevation changes, these groundwater elevation effects are expected to be most pronounced immediately adjacent to the slurry walls, with groundwater returning to normal elevations over



relatively short distances away from the slurry wall. At similar sites within the South Platte River alluvium, mounding and shadowing groundwater elevation changes of 2 to 3 feet have been observed adjacent to constructed slurry walls. However, the groundwater elevations generally return to normal gradients within several hundred feet of the slurry walls.



Figure 4. Estimated Significant Groundwater Drawdown Boundary and Proposed Monitoring Well Locations

Immediately upgradient (west and north) of Lamb Lakes, properties owned by Martin Marietta Materials and Richard Connell primarily contain active mining operations or rural agricultural activities. To the west of Lamb A and Lamb B, the land surface is, and appears to have historically been, about 5 to 10 feet above the normal groundwater elevation. The relatively high depth to groundwater would help to minimize any surface impacts from potential groundwater



mounding. Additionally, no structures are known to exist within these properties that could be affected by potential groundwater mounding. Similarly, southwest of Lamb B and Lamb C, the land surface elevation, and depth to groundwater increases quickly from the lakes and alluvial floodplain.

The Fort Collins Irrigation Canal Ditch runs along the west and south property boundaries. The ditch is typically about 4 feet deep and does not appear to be lined. It is reasonable to assume that, while the ditch is carrying water, seepage increases groundwater elevations and gradients flowing to the south and southeast. Construction of slurry walls immediately downgradient from the ditch would likely slow a major portion of the seepage and maximize flows through the ditch. However, if the ditch flows are maintained at the same rate/elevation as operated historically, slurry wall effects to groundwater would not be anticipated west or south of the ditch.

Shadowing impacts downgradient of Lamb Lakes are not likely. It is assumed that the Cache la Poudre River is in direct hydraulic connection with adjacent alluvial groundwater. Immediately northeast and east of the site, the river would be expected to minimize most shadowing effects from the slurry walls. Similarly, impacts from shadowing are not anticipated east of the river.

Since it is difficult to anticipate and quantify exact mounding and shadowing groundwater elevation changes, alluvial groundwater elevation monitoring is recommended. Since mounding and shadowing would occur following site reclamation, it is important that any monitoring program include wells that are not destroyed by mining or reclamation activities.

5.0 GROUNDWATER MONITORING

Routine groundwater elevation measurements and evaluation of potential dewatering and slurry wall impacts is recommended as part of a comprehensive groundwater monitoring plan Recommendations provided here define monitoring procedures and methods to be used during mine operations and reclamation activities at the Lamb Lakes Site to ensure monitoring data is accurate and representative of actual field conditions.

Based upon preliminary assessment of the site hydrogeologic characteristics, the monitoring plan should include the installation of new alluvial wells or, if constructed appropriately, existing alluvial wells. The monitoring wells shall penetrate the entire alluvial aquifer. The screened interval and surrounding filter pack shall allow for seasonal groundwater fluctuations and enable accurate depth to water data collection. The surface seal around the well shall be made of bentonite or other impermeable material that prevents surface water from directly draining to the well or filter pack. Wells to be included in the monitoring plan shall be surveyed to provide well coordinates and top of casing elevations (measuring point elevations) so that groundwater elevations can be used for potential groundwater impact evaluations.

Approximate locations for alluvial wells to be included in the monitoring plan are illustrated on **Figure 4**. Locations identified in the figure are approximate, and actual monitoring well locations may vary depending upon the potential inclusion of existing wells and property use restrictions. If necessary, it is assumed that permission can be obtained from landowners to locate wells outside the permit boundary. Eight wells should be placed outside of the anticipated mining and reclamation activities, but within the estimated dewatering radius of influence Dewatering and slurry wall impacts are not anticipated north and east of the Cache la Poudre River and, therefore, wells are not proposed across the river from the property.



Eight wells in the locations described are recommended for inclusion in the groundwater monitoring plan to evaluate general dewatering and slurry wall impacts. At the owner's discretion, extra wells may be added to the monitoring plan to evaluate groundwater impacts from specific mining, reclamation, or other aspects of property development. Additionally, wells may be added to the monitoring plan to specifically evaluate pre-existing or anticipated dewatering or slurry wall issues on adjacent properties.

Since baseline groundwater elevation information is not established, it is recommended that the monitoring wells be installed, and the groundwater monitoring program be initiated, a minimum of 18 months prior to new mining and reclamation activities at the site. Groundwater elevation monitoring should be performed quarterly. In addition to assessing baseline conditions and impacts from mining and reclamation activities, data evaluations may also consider potential changes to monitoring locations and frequency.



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APPENDIX A

Selected Reference Material

Colorado State University

Extension

Seasonal Water Needs and Opportunities for Limited Irrigation for Colorado Crops

Fact Sheet No. 4.718

Crop Series | Irrigation

by J. Schneekloth and A. Andales*

Crop water use, consumptive use and evapotranspiration (ET), are terms used interchangeably to describe the water consumed by a crop. This water is mainly used for cooling purposes; a negligible amount is retained by the crop for growth. For more information on ET refer to Colorado State University Extension Fact Sheet 4.715, *Crop Water Use and Growth Stages.*

Water requirements for crops depend mainly on environmental conditions. Plants use water for cooling purposes and the driving force of this process is prevailing weather conditions. Different crops have different water use requirements, under the same weather conditions. Crops will transpire water at the maximum rate when the soil water is at field capacity. When soil moisture decreases, crops have to exert greater forces (energy) to extract water from the soil. Usually, the transpiration rate doesn't decrease significantly until the soil moisture falls below 50 percent of available water capacity.

Knowing seasonal crop water requirements is crucial for planning your crop planting mixture, especially during drought years. For example, in the Greeley area, the seasonal water use of sugar beets is 30 inches, while corn uses only 22 inches of water. That means to fully irrigate sugar beets you need to apply 36 percent more water as compared to corn. These water requirements are net crop water use, the amount that the crop will use (not counting water losses) in an average year, given soil moisture levels don't fall below critical levels. Under ideal conditions, this net water requirement is reduced by the effective rain, which for the Greeley area is 7 inches for the growing season.

The rest of the crop water requirement must be supplied by irrigation. No irrigation system is 100 percent efficient, so to apply the net water requirement to the entire field, increase the amount of water or multiply by the efficiency (or inefficiency) of the irrigation system. Looking at the above example, the net water requirements, after subtracting effective rain, are 23 inches for sugar beets and 15 inches for corn. If the irrigation system is 85 percent efficient, apply 27 inches (gross irrigation amount) to the sugar beets crop and 17.6 inches to the corn crop to store the net water requirement in the crops' root zone. Now the difference between the seasonal gross water requirements of sugar beets and corn is 52 percent. The difference in the gross irrigation requirement amounts increases as the irrigation system efficiency decreases.

Net Crop Water Requirement

Net crop water requirement is estimated using models that are based on weather variables. Estimate seasonal crop water requirement by using these models and averaging weather conditions over many years. This will create an average weather year. Tables 1 and 2 are a summary of net water requirements of different crops and effective precipitation for different locations in eastern Colorado and western Colorado, respectively. To figure the net irrigation requirement, subtract the effective rain (Average Effective Precipitation from Tables 1 and 2) from the net crop water requirement. The gross irrigation water requirement is the net irrigation requirement divided by the irrigation system efficiency (fraction of one). For example, corn for grain in Burlington requires 26 inches of water. Effective precipitation is 11.28 inches for the season; therefore the net irrigation requirement is 14.72 inches. The gross irrigation requirement for a center pivot with 80 percent irrigation efficiency is 18.4 inches. For a furrow irrigation system with 55 percent irrigation efficiency, the gross irrigation requirement is 26.7 inches.



Quick Facts

- Knowing seasonal crop water requirements is crucial for planning your crop mixture.
- Net crop water requirements are estimated using models, based on weather variables.
- To irrigate for the greatest return, producers need to understand how crops respond to water, how crop rotation enhances water availability, and how changes in agronomic practices affect water needs.

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^{*}J. Schneekloth, Colorado State University Extension water resource specialist, U. S. Central Great Plains Research Station, Akron, Colorado; A. Andales, Colorado State University assistant professor, soil and crop sciences. 9/2009

Table 1. Estimated seasonal water requirement (consumptive use) in eastern Colorado (inches/season).

	Burlington	Byers	Cheyenne Wells	Colo. Springs	Holly	Greeley	Lamar	Longmont	Rocky Ford	Springfield	Sterling	Trinidad	Wray
Alfalfa	35.64	32.13	36.14	30.04	39.34	31.58	39.06	30.91	37.75	37.44	35.24	33.29	35.24
Grass hay/pasture	31.06	27.45	31.74	26.04	34.66	26.63	34.16	26.17	32.92	32.61	28.01	28.10	30.92
Dry beans	19.22 26.00		25.81	20.49	29.40	18.42	26.81	15.83 21.66	27.73	18.75 26.67		21.31	18.75 25.42
Corn, grain Corn, silage Corn, sweet	20.00		22.11	18.22	29.40 26.12	21.74 22.75	20.01	19.74	24.28 20.37	20.07	20.29	19.15	20.42
Melons Potatoes					15.85	28.14	15.80		15.13				
Small vegetables					18.71	17.70	18.85		22.23				
Sorghum, grain Soybeans	21.51	20.46		15.99	25.20	19.48	22.64			22.65			16.09 10.41
Spring grains		12.49					11.82	11.36	14.15	10.44	14.29		15.17
Sugar beets	29.98		30.43		34.83	29.31	34.27	25.48	32.70	32.28	29.99		29.99
Wheat, winter	18.99	16.42	18.55	14.06	19.65	16.38	19.30	18.46		18.64	12.53	16.14	
Av. Precipitation Av. Effective	16.35	18.57	16.26	15.73	15.33	12.20	5.33	12.74	12.53	15.36	14.92	12.80	18.51
Precipitation	11.28	10.39	11.68	10.59	10.72	7.32	11.00	6.99	8.89	10.93	6.68	8.28	12.56

Yield vs Evapotranspiration



Figure 1: Yield vs. ET relationship for several irrigated crops.



Water (ET or Irrigation) Figure 2: Generalized Yield vs. ET and Yield vs. Irrigation production functions.

In Colorado's semi-arid climate, irrigation is important to increasing ET and grain yields, supplementing rainfall in periods when ET is greater than precipitation. However, not all of the water applied by irrigation is used for ET. Inefficiencies in applications by the system result in losses. As yield is maximized, more losses occur since the soil is closer to field capacity and more prone to losses, such as deep percolation, which cause the deviation from the straight line (Figure 2). By applying less than needed for maximum yield, water can be saved. As seen in Figure 2, a reduction in water applied from point A to point B can save water with little or no yield reduction.

In Colorado's semi-arid climate, irrigation is important to increasing ET and grain yields, supplementing rainfall in periods when ET is greater than precipitation. However, not all of the water applied by irrigation is used for ET. Inefficiencies in applications by the system result in losses. As yield is maximized, more losses occur since the soil is closer to field capacity and more prone to losses, such as deep percolation, which cause the deviation from the straight line (Figure 2). By applying less than needed for maximum yield, water can be saved. As seen in Figure 2, a reduction in water applied from point A to point B can save water with little or no yield reduction.

Limited Irrigation

When water supplies are restricted in some way, so that full evapotranspiration demands cannot be met, limited irrigation results. Reasons that producers may be limited on the amount of available water include: 1.) limited capacity of the irrigation well – in regions with limited saturated depth of the aquifer, well yields can be marginal and not sufficient to meet the needs of the crop; 2.) reduced surface water storage – in regions that rely upon surface water, droughts and seasonal fluctuation affect the water allocations available for users.

When producers cannot apply water to meet the crop ET, they must realize that with typical management practices, yields and returns will be reduced as compared to a fully irrigated crop. To properly manage the water for the greatest return, producers must understand how crops respond to water, how crop rotations can enhance water availability, and how changes in agronomic practices influence water needs.

Yield vs. ET and Irrigation

Crop yields increase linearly with the water that is used by the crop (Figure 1). Crops such as corn, respond with more yield for every inch of water that the crop consumes as compared to winter wheat or sunflower. High water use crops, such as corn, require more ET for plant development or maintenance before yields are produced. Corn requires approximately 10 inches of ET as compared to 4.5 and 7.5 inches of ET for wheat and sunflower. These crops also require less ET for maximum production compared to corn.

Irrigation is important to increasing ET and grain yields. Irrigation is used to supplement rainfall in periods when ET is greater than precipitation. However, not all of the water applied by irrigation can be used for ET. Inefficiencies in applications by the system result in losses. As yield is maximized, more losses occur since the soil is nearer to field capacity and more prone to losses such as deep percolation (Figure 2). Water can be saved by applying less water than needed for maximum yield. As seen in Figure 2, a reduction in water applied from point A to point B can save water with little or no yield reduction.

When producers are faced with reduced surface water supplies, they have three management options

- 1. reduce irrigated acreage,
- 2. reduce irrigation amounts to the entire field, or
- 3. include different crops that require less irrigation.

Table 2. Estimated seasonal water requirement (consumptive use) in western Colorado* (inches/season).

	Canon City	Cortez	Durango	Gunnison	Fruita	Meeker	Monte Vista	Norwood	Salida	Walden
Alfalfa	39.69	29.36	27.49	17.99	36.22	23.55	23.58	23.58	24.83	12.89
Grass hay/pasture	33.49	24.74	23.17	17.12	31.44	21.43	19.85	20.40	20.90	13.61
Dry beans					19.93					
Corn, grain					25.12					
Corn, silage	22.21	17.98	16.06		22.67	17.34				
Corn										
Melons										
Orchards w/o cover crop	27.12									
Orchards w/ cover crop					25.71					
Potatoes							16.49			
Small vegetables					18.06		6.79			
Sorghum, grain										
Soybeans										
Spring grains		13.51	14.79	16.73		19.61	15.46	12.66	11.38	18.04
(barley, wheat)										
Sugarbeets					31.58					
Wheat, winter	18.70	20.13	18.83		18.95					
Av. Precipitation	12.99	12.90	18.59	11.00	8.30	17.06	7.25	15.73	11.37	9.56
Av. Effective Precipitation	9.28	5.09	8.34	3.80	3.98	6.19	3.93	6.05	5.66	3.02

*Colorado Irrigation Guide, 1988. Net irrigation requirement is the difference between crop consumptive use and effective precipitation.



Figure 3: Example of daily ET during the growing season.

Limited Water Management – Reduced Allocations

When producers are faced with reduced surface water storage, they have three management options. They can: 1.) reduce irrigated acreage, 2.) reduce irrigation to the entire field, or 3.) include different crops that require less irrigation. Option 1 will idle potentially productive ground while option 2 will reduce yields for the irrigated acres unless precipitation is above normal. Option 3 incorporates the use of crops that require less irrigation for maximum production to apply the "saved water" for traditionally irrigated crops.

An example in Longmont would be irrigating all corn or irrigating some corn and dry beans. Corn requires 17.3 inches of irrigation (85 percent efficiency) and dry bean requires 10.4 inches. If the allocation from the ditch limits a producer to 14 inches of water, he or she could raise 80 percent of their acres to irrigated corn and the remainder in dryland production or idle. They could also raise 100 percent of available acres to corn and apply only rigation required for maximum production. The final option would be to raise 50 percent of available acres to dry bean and 50 percent to corn and maintain maximum production on all acreage.

80 percent of the ir-

Limited Water Management – Low Capacity Systems

When managing for maximum production, irrigation systems must have minimum capacities that meet crop water requirements during peak water use periods. (See Fact Sheet 4.704, Center-pivot Irrigation Systems.) If irrigation system capacities are below what is normally required, reduced yields are expected with normal precipitation. Management strategies to compensate for low capacity include pre-irrigation and beginning irrigation at higher soil moisture contents. These strategies may maintain yields in above normal precipitation years but do not help as much in below normal precipitation years. Management strategies to alleviate this problem include splitting systems into two or more crops that have different peak water needs, thus reducing the rate of water requirements during both peak periods.

Crop rotations also spread the irrigation season over a greater time period as compared to a single crop. When planting multiple crops such as corn and winter wheat under irrigation, the irrigation season is extended from May to early October as compared to continuous corn, which is predominantly irrigated from June to early September.

Crops such as corn, soybean and wheat have different timings for peak water use (Figure 3). With low capacity wells, planting multiple crops with smaller acreages allows for water to be applied at amounts and times when the crop needs the water. The net effect of irrigating fewer acres at any one point in time is that ET demand of that crop can be better met. If capacities are increased by splitting acres into crops that have different water timing needs, management can be done to replace stored soil moisture rather than maintaining soil moisture near field capacity in anticipation of crop ET since the system will not meet ET.

Another option is to plant the entire pivot or field to a single crop. Irrigation management with low capacity systems requires that a producer maintain soil moisture at or near field capacity when ET is less than what the system can apply. When the ET for the crop is greater than the capacity of the system, plants will use stored soil moisture to maintain ET. This type of management is necessary to insure that moisture will be available for plants when they reach the reproductive growth stage. However, if precipitation is less than anticipated, soil moisture may be less than 50 percent of available during the reproductive growth stage and yields will be reduced.

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Map U.S. map Page

NOTE: To print data frame (right side), click on right frame before printing.

1981 - 2010

- <u>Daily Temp. & Precip.</u>
 <u>Daily Tabular data (~23 KB)</u>
- <u>Daily Tabular data (~23 KB)</u>
 <u>Monthly Tabular data (~1 KB)</u>

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1971 - 2000

- Daily Temp. & Precip.
- Daily Tabular data (~23 KB)
- Monthly Tabular data (~1 KB)
- NCDC 1971-2000 Normals (~3 KB)

1961 - 1990

FT COLLINS, COLORADO (053005)

Period of Record Monthly Climate Summary

Period of Record : 01/01/1893 to 06/10/2016

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec 7	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Annual
Average Max. Temperature (F)	41.4	44.2	51.2	60.6	69.1	79.3	85.2	83.5	75.4	64.2	51.1	42.5	41.4 44.2 51.2 60.6 69.1 79.3 85.2 83.5 75.4 64.2 51.1 42.5 62.3
Average Min. Temperature (F)	13.7	17.1	24.0	33.0	42.1	50.4	56.0	54.2	45.1	34.2	23.1	15.5	$13.7 \ 17.1 \ 24.0 \ 33.0 \ 42.1 \ 50.4 \ 56.0 \ 54.2 \ 45.1 \ 34.2 \ 23.1 \ 15.5 \ 34.0$
Average Total Precipitation (in.)	0.36	0.48	1.18	1.97	2.74	1.83	1.62	1.42	1.27	1.13	0.59	0.49	$0.36 \ 0.48 \ 1.18 \ 1.97 \ 2.74 \ 1.83 \ 1.62 \ 1.42 \ 1.27 \ 1.13 \ 0.59 \ 0.49 \ 15.08$
Average Total SnowFall (in.)	6.0	6.8	10.2	6.2	1.2	0.0	0.0	0.0	0.5	3.1	6.5	6.7	6.0 6.8 10.2 6.2 1.2 0.0 0.0 0.0 0.5 3.1 6.5 6.7 47.1
Average Snow Depth (in.)	7	1	1	0	0	0	0	0	0	0	1	1	2 1 1 0 0 0 0 0 0 0 1 1 0
Percent of possible observations for period of record. Max. Temp.: 99.6% Min. Temp.: 99.6% Precipitation: 99.6% Snowfall: 99.5% Snow Depth: 50.1%	le obse 5% Mi	ervati n. Tei	ons fc mp.: 9	or peri 9.6%	od of Preci	recore	1. m: 99	.6% S	nowfi	all: 99	.5%	Snow]	Depth:
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Water-Table Contour

From S.G. Robson, J.S. Heiny, and L.R. Arnold 2000. Hydrology of the Shallow Aquifers in the Fort Collins-Loveland Area, Colorado, Hydrologic Investigations Atlas HA-746B, Sheet 3 of 5
Analytical and Numerical Simulation of the Steady-State Hydrologic Effects of Mining Aggregate in Hypothetical Sand-and-Gravel and Fractured Crystalline-Rock Aquifers

By L.R. Arnold, W.H. Langer, and S.S. Paschke

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 02-4267

Denver, Colorado 2003 Front Range mountains generally are steep. Recharge to the fractured crystalline-rock aquifer has been estimated to range from 0 to 21 percent of precipitation with an average of 3.2 percent (Hofstra and Hall, 1975) to 10 percent (Mueller, 1979).

In the Colorado Front Range, rock quarries typically are mined dry (Langer, 2001). Although quarries may penetrate the water table, the discharge rate to quarries commonly is less than the rate of evaporation, and active dewatering measures are not needed. The quarry may drain freely. To produce aggregate, the rock is first drilled and blasted. Blasting commonly breaks the rock into pieces suitable for crushing, and the blasted material is extracted using conventional earth-moving equipment such as bulldozers, front loaders, and track hoes. Material is transported, either by truck or conveyor, from the mining face to the processing plant where it is crushed, washed, and sorted by size.

GROUND-WATER HYDRAULICS AND MATHEMATICAL METHODS

To evaluate the effects of aggregate mining on the surrounding water table, ground-water flow was simulated with analytical and numerical solutions to the ground-water flow equation. A general form of the equation describing transient (time-varying) threedimensional ground-water flow can be written as (Konikow and Grove, 1977; McDonald and Harbaugh, 1988):

$$\frac{\partial(bK_x\frac{\partial h}{\partial x})}{\partial x} + \frac{\partial(bK_y\frac{\partial h}{\partial y})}{\partial y}$$
(1)
+
$$\frac{\partial(bK_z\frac{\partial h}{\partial z})}{\partial z} = S\frac{\partial h}{\partial t} + W(x, y, z, t)$$

where

- K_x is aquifer hydraulic conductivity in the x-direction (L²/T),
- K_y is aquifer hydraulic conductivity in the y-direction (L²/T),

- K_z is aquifer hydraulic conductivity in the z-direction (L²/T),
- *b* is aquifer saturated thickness (L),
- *h* is hydraulic head (L),
- *S* is storage coefficient (dimensionless),
- W is volumetric flux per unit area from a hydrologic source or sink as a function of location and time (L/T),
- x,y,z are Cartesian coordinates, and
- t is time (T).

This equation assumes compressible fluid of constant density is flowing through a heterogeneous anisotropic aquifer according to Darcy's law (Fetter, 1994). It also assumes the principal axes of the hydraulic conductivity tensor are aligned with the *x*, *y*, and *z* coordinate axes, respectively (McDonald and Harbaugh, 1988). Additional details of the groundwater flow equation and its derivation can be found in numerous texts and reports (Freeze and Cherry, 1979; Lohman, 1979; Huyakorn and Pinder, 1983; McDonald and Harbaugh, 1988; Domenico and Schwartz, 1990; Anderson and Woessner, 1992; Fetter, 1994).

The ground-water flow equation can be solved for the dependent variable head (h) by analytical or numerical methods. Analytical solutions use algebraic methods to derive closed-form solutions to the groundwater flow equation, whereas numerical solutions use finite-difference or finite-element numerical methods to solve the ground-water flow equation. Analytical solutions to the ground-water flow equation are most useful for evaluating simplified ground-water systems and often assume a homogeneous and isotropic hydraulic-conductivity distribution, horizontal flow, and infinite horizontal extent or limited boundary conditions. Analytical methods can be useful for estimating mine inflows and drawdowns during initial stages of mine planning when site-specific data may not yet be available (Marinelli and Niccoli, 2000). The applicability of an analytical solution depends on the extent to which the real problem under consideration is consistent with the simplifying assumptions of the analytical solution. Analytical solutions that assume infinite horizontal extent can be useful in predicting drawdown in real aquifers of finite extent when aquifer boundaries lie beyond the cone of depression in the water table (area of influence) caused by the pit. When boundaries lie outside the area of influence, the aquifer within the area of influence responds as though it were

6 Analytical and Numerical Simulation of the Steady-State Hydrologic Effects of Mining Aggregate in Hypothetical Sand-and-Gravel and Fractured Crystalline-Rock Aquifers of infinite extent because no boundaries are contacted. Numerical simulations are useful for evaluating more complex flow systems such as heterogeneous or anisotropic hydraulic-conductivity distributions, multiple boundary conditions, and transient conditions. Numerical methods may be required during advanced stages of mine planning when more detailed geologic and hydrologic data are available for a site (Marinelli and Niccoli, 2000). Analytical and numerical methods can be coded into computer programs to facilitate their use.

Both analytical and numerical simulation methods were used in this study to evaluate the steadystate (time-invariant) effects of mining aggregate on water-table conditions. A steady-state two-dimensional analytical solution to the ground-water flow equation by Marinelli and Niccoli (2000) and a steadystate one-dimensional analytical solution derived during this study were used to estimate the extent of drawdown around a mine in a homogeneous, isotropic aquifer of infinite extent. The U.S. Geological Survey modular ground-water model, MODFLOW–2000 (Harbaugh and others, 2000), was used to evaluate steady-state effects of aggregate mining under more complex hydrogeologic conditions.

The steady-state two-dimensional analytical solution of Marinelli and Niccoli (2000) estimates

radial ground-water flow toward a circular mine pit. The analytical solution for head in the aquifer adjacent to a circular pit of radius r_p is given as:

$$h = \sqrt{h_p^2 + \frac{W}{K_h} \left[r_i^2 \ln\left(\frac{r}{r_p}\right) - \left(\frac{r^2 - r_p^2}{2}\right) \right]} \quad (2)$$

where

- *h* is saturated thickness above the pit base at *r* (radial distance from pit center) [L],
- h_p is saturated thickness above the pit base at r_p (at the mine wall) [L],
- W is distributed recharge flux [L/T],
- K_h is horizontal hydraulic conductivity of surrounding geologic materials [L/T],
- r_i is radius of influence (maximum extent of the cone of depression) [L],
- *r* is radial distance from pit center [L],
- r_p is effective pit radius [L] (fig. 3).

Given input values of h_{p_i} , W, K_h , r_p , and initial (premining) saturated thickness above the pit base $(h = h_o)$, the radius of influence (r_i) can be determined through iteration by setting r equal to r_i . Once r_i is



Figure 3. Conceptual diagram of the Marinelli and Niccoli analytical solution (modified from Marinelli and Niccoli, 2000).

determined, *h* can be calculated for any radial distance from the pit, and drawdown can be calculated as $h_o - h$. In addition, the inflow rate, *Q* [L³/T], through the pit wall can be calculated as:

$$Q = W\pi(r_i^2 - r_i^2)$$
 (3)

The analytical solution of Marinelli and Niccoli (2000) is valid for ground-water flow systems that meet the following assumptions:

- The geologic materials are homogeneous and isotropic;
- Ground-water flow is steady state, unconfined, horizontal, radial, and axially symmetric;
- Recharge is uniformly distributed at the water table and all recharge within the radius of influence is captured by the pit;
- Pit walls are approximated as a right circular cylinder;
- The static premining water table is approximately horizontal; and
- The base of the pit is coincident with the base of the aquifer, and there is no flow through the pit bottom.

Marinelli and Niccoli (2000) also present an analytical solution for upward ground-water flow through the bottom of a pit that partially penetrates an aquifer.

However, inflow to the bottom of a pit is not considered in this report because (1) analytical solutions are used only to calculate hydraulic head at the water table, which is independent of ground-water flow through the mine bottom in the solution, (2) the bottom of aggregate mines in sand-and-gravel aquifers in the Front Range area generally are near the base of the aquifer, and (3) hydraulic conductivity of fractured crystalline-rock aquifers generally becomes exceedingly small with depth, which limits inflow to the mine bottom. For pits that do not meet these conditions, consideration of flow to the mine bottom may be important.

A steady-state, one-dimensional analytical solution is derived for ground-water flow to a mine excavated into a steep hillside such as in the mountainous part of the Front Range area. The derivation of the one-dimensional solution is similar to the Marinelli and Niccoli (2000) solution, but the mine is represented as a straight line along a hillside rather than a circular pit. The mine in this situation intercepts only the upgradient ground water within the hillside. Ground-water flow toward the mine at distance xupgradient from the mine wall can be expressed as:

$$Q = K_h h \frac{dh}{dx} \tag{4}$$

where

Q is flow per unit length of the mine [L²/T],

 K_h is horizontal hydraulic conductivity of surrounding geologic materials [L/T],

- *h* is saturated thickness above the mine base at distance *x* from the mine wall [L], and
- x is distance upgradient from mine wall [L].

If all ground-water flow to the mine is assumed to originate from uniform distributed recharge (W) within the drawdown distance of influence (x_i) of the mine, then flow toward the mine also can be expressed as:

$$Q = W(x_i - x) \tag{5}$$

Substituting equation 5 into equation 4 and integrating from the mine wall to distance *x* gives:

$$\frac{W}{K_h}\int_0^x (x_i - x)dx = \int_{h_m}^h hdh$$
(6)

where

 h_m is saturated thickness above the mine base at the mine wall [L].

Carrying out the integration leads to an analytical solution for head in the aquifer adjacent to a linear mine that is given as:

$$h = \sqrt{h_m^2 + \frac{W}{K_h} [2x_i x - x^2]}$$
(7)

8 Analytical and Numerical Simulation of the Steady-State Hydrologic Effects of Mining Aggregate in Hypothetical Sand-and-Gravel and Fractured Crystalline-Rock Aquifers Given input values of h_m , W, K_h , and initial (premining) saturated thickness above the base of the mine $(h = h_o)$, the distance of influence (x_i) can be calculated directly by setting x equal to x_i and rearranging equation 7. Once x_i is determined, h can be calculated for any distance upgradient from the mine wall, and drawdown can be calculated as $h_o - h$. In addition, the inflow rate per unit length of mine, Q [L²/T], can be calculated as:

$$Q = W x_i \tag{8}$$

The analytical solution for a linear mine wall is valid for ground-water flow systems that meet the following assumptions:

- The geologic materials are homogeneous and isotropic;
- Ground-water flow is steady state, unconfined, horizontal, and perpendicular to the mine wall;
- Recharge is uniformly distributed at the water table, and all recharge within the distance of influence is captured by the mine;
- The uphill mine wall is approximated as a straight line;
- The static premining water table is approximately horizontal; and
- The base of the pit is coincident with the base of the aquifer, and there is no flow through the mine bottom.

MODFLOW-2000 (Harbaugh and others, 2000) was used to estimate the steady-state extent of drawdown near a mine and ground-water inflow to a mine under conditions that consider heterogeneity, anisotropy, and boundaries. MODFLOW–2000 solves the transient ground-water flow equation by using implicit finite-difference methods and is based on a threedimensional, block-centered, finite-difference grid. Aquifer properties can be heterogeneous and anisotropic provided the principal axes of hydraulic conductivity are aligned with the coordinate directions (Harbaugh and others, 2000; McDonald and Harbaugh, 1988), and aquifer layers can be simulated as confined, unconfined, or a combination of both (Harbaugh and others, 2000). MODFLOW–2000 can simulate several types of hydrologic sources and sinks including aquifer recharge, evapotranspiration, wells, drains, and rivers, and it can simulate either steadystate or transient conditions.

SIMULATION OF THE HYDROLOGIC EFFECTS OF MINING AGGREGATE

Two hydrogeologic settings in the Colorado Front Range area were simulated using analytical and numerical methods. The first set of simulations used conceptualizations of aggregate mining in sand-andgravel aquifers, and the second set of simulations used conceptualizations of aggregate mining in fractured crystalline-rock aquifers. Analytical and numerical simulations were used to estimate the steady-state hydrologic effects of mining. Under steady-state conditions, discharge to a mine reaches equilibrium with the surrounding ground-water system, and the extent of drawdown caused by dewatering a mine ceases to increase. Therefore, steady-state simulations predict the maximum potential effects of mining over time. To predict short-term effects, transient (timevarying) simulations are necessary. Steady-state simulations of pits in sand-and-gravel aquifers may overpredict the effects of mining if active dewatering of the pit ceases before steady-state conditions are reached. The hydrologic effects of pits in sand-andgravel aquifers after active dewatering ceases (pits lined with slurry walls or refilled pits undergoing evaporative losses) likely reach steady-state conditions because such pits may be left open indefinitely. The hydrologic effects of quarries in fractured crystallinerock aquifers also likely reach steady-state conditions because quarries commonly drain without the aid of active dewatering measures (Knepper, 2002) and may be left open indefinitely. Predicting the transient hydrologic effects of mining is beyond the scope of this report.

Simulation of Pits in Sand-and-Gravel Aquifers

Definitions of input parameters for simulations of aggregate mining in sand-and-gravel aquifers were based on data reported in the literature (see "Hydrogeologic Settings"). Definitions of mining extents (area and depth) were defined based on mine

APPENDIX B

Selected Site Geotechnical Information

REPORT OF A MINERAL RESOURCES EVALUATION

FOR

MR. MIKE DONALDSON FORT COLLINS, COLORADO

FROJECT NO. 2111-75 RE: A PARCEL OF LAND NORTH OF FORT COLLINS, COLORADO

<u>i</u> de la com

BY

EMPIRE LABORATORIES, INC. 214 NORTH HOWES STREET FORT COLLINS, COLORADO 80521



Empil Laboratories, Inc.

BOUDAN 127 (* 1213) STREET SAN Der Claus (Schriebssoften) * USApplication Basels and The

Septimber 9, 1977

Mr. Mike Donaldson 705 Cheyenne Drive Fort Collins, Colorado 80521

Dear Mr. Donaldson:

We are pleased to submit our Report of a Mineral Resources Evaluation prepared for a parcel of land located on the Taft Hill Road farm, Larimer County, Colorado, as requested.

The accompanying report presents our findings in the subsurface and our evoluation based upon these findings.

Very truly yours,

EMPIRE LABORATORIES, INC.

ALE LE

Mark E. Karle Engineering Geologist

mmp

Reviewed by:

Chester C. Smith, P.E. Vice President





MATERIALS AND FOUNDATION ENGINEERS . MEMBER OF CONSULTING ENGINEERS COUNCIL OFFICES AND LABORATORIES IN FORT COLLINS, COLORADO AND CHEVENNE, WYOMING

REPORT OF A MINERAL RESOURCES EVALUATION

SCOPE

This report presents the results of a Mineral Resources Evaluation prepared for a parcel of land located near North Taft Hill Road, north of Fort Collins, Colorado.

The objective of this investigation was to evaluate the natural resources available at the site.

SITE INVESTIGATION

The field investigation, carried out on August 25, 1975, consisted of drilling and logging nine (9) test borings. The locations of the test borings are shown on the Test Boring Location Plan included on page 4 of this report. Boring logs prepared from the field logs are shown on pages 6 and 7. These logs show soils encountered and groundwater at the time of the investigation.

All borings were advanced with a four-inch diameter, continuoustype, power-flight auger drill. During the drilling operations, an engineering geologist from Empire Laboratories, Inc. was present and made a continuous visual inspection of the soils encountered.

SITE LOCATION AND DESCRIPTION

The site is located along Taft Hill Road and is bordered on the south by the new Lincoln Junior High School, north of Fort Collins, Colorado. More particularly, the site is located on the Taft Hill Road Farm situate.in Section 3, Township 7 North, Range 69 West of the Sixth P.M., Larimer County, Colorado.

The area consists of mostly open farm fields with a vegetation cover of hay, barley and corn. The northwest portion of the site is mostly weed covered.

The site is located in the flood plain of the Cache La Poudre River and is relativ flat. A small marshy area is located in the south and east portions of the proper Two (2) small ponds are located in the northwest and east-central portions of the site.

SOIL AND GROUNDWATER CONDITIONS

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The soil profile at the site consists of strata of materials arranged in different combinations. In order of increasing depths, they are as follows:

- <u>Silty Topsoil</u>: The site is overlain by one (1) foot of silty topsoil. The upper six (6) inches of the topsoil have been penetrated by plant roots and organic matter.
- (2) <u>Silty and/or Sandy Clay</u>: Underlying the topsoil in Borings 3 and 4 and 6 through 9 and extending to depths of two and one-half (2½) to four (4) feet below the surface is a stratum of clay. The clays are damp to wet and contain varying amounts of silt and/or sand.
- (3) Sand, Gravel, Cobbles and Boulders: This stratum underlies the clays at depths of two and one-half (2½) to four (4) feet below the surface and extends to depths of thirteen and one-half (13½) to twenty-four and one-half (14½) feet below the surface. The sands and gravels are well-graded and clean below the water table. It is estimated that the cobbles and boulders within this stratum range in size up to eighteen (18) inches in diameter.
- (4) <u>Claystone (Bedrock)</u>: Claystone bedrock was encountered below the gravel stratum at depths of thirteen and one-half (13¹/₂) to twenty-four and one-half (24¹/₂) feet below the surface. The upper one (1) foot of the claystone is weathered; how-ever, the rock below this weathered zone is firm.

(5) <u>Groundwater</u>: At the time of investigation, free groundwater was encountered at approximate depths of two (2) to nine (9) feet below the surface. Groundwater levels in this area are subject to change due to seasonal variations, upon water levels in the Cache La Poudre River, and upon irrigation demands on the property.

DISCUSSION

The granular material encountered on the site consists of well-rounded river deposited rocks of a hard durable granite nature. It is our opinion that this material is of suitable size, hardness and quality to be used as a commercial aggregate source. In addition, there is suitable quantity, being well above the maximum 3: 1 ratio of aggregate to overburden to make extraction economically feasible.

Based upon our test borings, it is estimated that approximately two hundred eighteen (218) acres of commercial quality aggregate could be obtained totaling over five and one-half (5½) million cubic yards. Approximately nine hundred fifty thousand (950,000) cubic yards of overburden would have to be removed in order to recover this gravel. However, much of this material is suitable as filler material in the production of base course material. In addition, the topsoil overlying the site has some economical value. Since a majority of the sand and gravel is below groundwater, excavation would have to be accomplished by use of a dragline or the site would have to be dewatered.

GENERAL COMMENTS

This report has been prepared in order to aid in the evaluation of the mineral resources available on the property. This report does not reflect any variations in the soil which may exist between the borings. The nature and extent of these variations between the borings may not become evident until a later date. If variations do appear, it may be necessary to make a re-evaluation of the quantities as discussed above. To aid in this re-evaluation, additional test borings may be necessary.





KEY TO BORING LOGS

.,

30 C

0

GRAVEL

COBBLES

SAND & GRAVEL

SILTY SAND & GRAVEL

SAND, GRAVEL & COBBLES

WEATHERED BEDROCK

SILTSTONE BEDROCK

CLAYSTONE BEDROCK

SANDSTONE BEDROCK



TOPSOIL

FILL

SILT



11



CLAYEY SILT



SANDY SILT

CLAY



SILTY CLAY



SANDY CLAY



SAND



SILTY SAND



CLAYEY SAND



Ħ



SHELBY TUBE SAMPLE







GRANITE

















STANDARD PENETRATION DRIVE SAMPLER

WATER TABLE _____ HOURS AFTER DRILLING

HOLE CAVED

5/12 Indicates that 5 blows of a 140 pound harmer falling 30 inches was required to penetrate 12 inches

				·	
<u>PEPTH</u>	<u>No. 1</u>	N5.2	No. 3	<u>16.7</u>	No.
	22	22	11.2	1.1	
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LOG OF BOREMES No.8 <u>NJ. 9</u> No. 6 No. 7 DEPTH . 0 11 1/1. 12 14 1 / / / -77- $\sum_{i=1}^{n}$ 1 1 1 . / • 1 ∇ 2.5 ()**-**. . / Þ . ٠ ĺ 9 5 10 <u>.</u> > • <u>.</u> 6 • • <u>ب</u> ا • • <u>.</u> -v 0 à • • • • 10 ______ . _____ • 2 بنحوا -----&-\$.° -<u>--</u>-. -0 Г, Е Þ., -0 . . . • 7 . ۲ 15 بغر العومة العومة <u>___</u> r, . . ۶. -0-5 . э 5[°] • 20 -c <u>р</u> у. 25 . • . • _ EMPIRE LABORATORIES, INC. _

Initial Engineering Design Report

Treiber Lakes Slurry Wall Project Larimer County, Colorado

Prepared by:

EnviroGroup Limited Longmont, CO

Prepared for:

Tri-Districts / Soldier Canyon Filter Plant and City of Greeley, Colorado

> *August 17, 2012* Project No. TD-0767



MECHANICAL ANALYSIS - SIEVE TEST DATA ASTM D 6913

CLIENT EnviroGr	oup Limited		JOB NO.	2108-17	
BORING NO. DEPTH SAMPLE NO. SOIL DESCR. LOCATION	B-1 Treiber Lakes		SAMPLED DATE+#4 DATE -#4 WASH SIE DRY SIEV	WASHED WASHED VE	05/22/12 DAW 05/22/12 DAW Yes No
MOISTURE DATA			WASH SIE	VE ANALYS	sis
HYGROSCOPIC	Yes		Wt. Total S		
NATURAL	No		Wet Weight of +		932.64
		•	Before Was Weight of +	shing (g)	251.49
Wt. Wet Soil & Pan (g Wt. Dry Soil & Pan (g	g) 1:	58.79 58.44	After Wash Weight of -	ing (g)	240.10
Wt. Los: Moisture (g Wt. of Pan Only (g))	0.35	Wet Weight of -	(g)	681.15
Wt. of Dry Soil (g) Moisture Content %		51.80 0.2	Dry (Wt. Total S	g)	690.95
			Dry (931.05
Wt. Partial -#4 Sample Wt. Partial Sample Dr		8.01	Calc Wt. "		360.31
ww. Faruar Sample Ur	y (g) 26	57.39	Calc Mass	+ #4	92.92

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	9.83	9.83	9.83	1.1	98.9
3/8"	0.00	116.56	116.56	126.39	13.6	86.4
#4	0.00	113.71	113.71	240.10	25.8	74.2
#10	3.15	58.81	55.66	55.66	41.2	59.0
#20	3.19	80.93	77.74	133.40	62.8	58.8 37.2
#40	3.13	58 56	55.43	188.83	78.2	21.8
#60	3.06	27.72	24.66	213.49	85.0	15.0
#100	2.95	18.98	16.03	229.52	89.5	10.5
#140	3.03	10 30	7.27	236.79	91.5	8.5
#200	2.97	8.62	5.65	242.44	93.1	6.9

Data entered by: DAW Data checked by SH DAW FileName ELM0B1TL

Date 05/24/2012 Date 5/24/12





MECHANICAL ANALYSIS - SIEVE TEST DATA ASTM D 6913

CLIENT EnviroG	roup Limited		JOB NO. 2108-17	
BORING NO. DEPTH SAMPLE NO. SOIL DESCR. LOCATION	B-7 Treiber Lake	25	SAMPLED DATE+#4 WASHED DATE -#4 WASHED WASH SIEVE DRY SIEVE	05/22/12 DAW 05/22/12 DAW Yes No
MOISTURE DATA			WASH SIEVE ANALY	SIS
HYGROSCOPIC	Yes		Wt. Total Sample	
NATURAL	No		Wet (g) Weight of + #4	2354.46
			Before Washing (g) Weight of + #4	964.36
Wt. Wet Soil & Pan (Wt. Dry Soil & Pan (3)	92 39 92.06	After Washing (g) Weight of - #4	532.74
Wt. Lost Moisture (g Wt. of Pan Only (g))	0.33	Wet (g) Weight of - #4	1390.10
Wt. of Dry Soil (g) Moisture Content %		88.95 0.4	Dry (g) Wt. Total Sample	1814.99
			Dry (g)	2347.73
Wt. Partial -#4 Sampl	e Wet (g)	206.88	Calc. Wt. "W" (g)	266.61
Wt. Partial Sample Dr	ry (g)	206.12	Calc. Mass + #4	60.50

Sieve Number (Size)	Pan Weight (g)	Indiv Wt + Pan (g)	Ndiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00				
the second se	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2'	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	26.71	26.71	26.71	1.1	98.9
3/8"	0.00	271 92	271.92	298.63	12.7	87.3
#4	0.00	234.11	234.11	532.74	22.7	77.3
#10	2.97	53.09	50.12	50.12	41.5	58.5
#20	3.02	41.44	38.42	88.54	55.9	44.1
#40	3.03	33.49	30.46	119.00	67.3	32.7
#60	3.05	24.14	21.09	140.09	75.2	24 8
#100	2.99	18.95	15.96	156.05		
#140	3.01	11.96			81.2	18.8
#200			8.95	165.00	84.6	15.4
#200	3 02	10.40	7 38	172.38	87.3	12.7

Data entered by: DAW Data checked by: DAW FileName: ELM0B7TL

Date 5/24/2012 Date 5/24/12





MECHANICAL ANALYSIS - SIEVE TEST DATA ASTM D-6913

CLIENT EnviroGroup Limited

JOB NO. 2108-17

BORING NO.	B-9	SAMPLED	
DEPTH	10-10.35'	DATE TESTED	05/18/12 DAW
SAMPLE NO		WASH SIEVE	Yes
SOIL DESCR.		DRY SIEVE	No
LOCATION	Treiber Lakes		110

WASH SIEVE ANALYSIS

Wt. Wet Soil & Pan	
Before Washing (g)	1120.3
WI Dry Soil & Pan	
Before Washing (g)	1114.7
Weight of Pan (g)	854.1
Wt. of Dry Soil	
Before Washing	260.6
Wt. Dry Soil & Pan	
After Washing (g)	1089.9
Wt. of Dry Soil	
After Washing (g)	235.8
-#200 Wash. Out %	9.5

Sieve Number	Pan Weight	Indiv Wt. + Pan	Indiv. Wt.	Cum. Wt.	Cum.	% Finer	
(Size)	(g)	(g)	Retain.	Retain	Retain	By Wt.	
3"	0.00	0.00	0.00	0.00	0.0	100.0	
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0	
3/4"	3.06	12.90	9.84	9.84	3.8	96.2	
3/8"	3.02	49.67	46.65	56.49	21.7	78.3	
#4	3.07	38.96	35.89	92.38	35.4	64.6	
#10	3.06	44.38	41.32	133.70	51.3	48.7	
#20	3.03	39.35	36.32	170.02	65.2	34 8	
#40	3.08	27.46	24.38	194.40	74.6	25.4	
#60	3.00	19.23	16.23	210.63	80.8	19.2	
#100	2.99	15.93	12.94	223.57	85.8	14.2	
#140	3.06	9.98	6.92	230.49	88.4	11.6	
#200	2.97	8 31	5.34	235.83	90.5	9.5	

Data entered by: DAW Data checked by: JU FileName: ELM0B910

Date 05/21/2012 Date 5/22/12





GEOTECHNICAL ENGINEERING REPORT

TRI-DISTRICTS TREIBER B SLURRY WALL LINING AND RECLAMATION LARIMER COUNTY, COLORADO

Prepared for:

Tri-Districts 4424 Laporte Avenue Fort Collins, Colorado 80521

Prepared by:

Tetra Tech 1900 South Sunset Street, Suite 1-E Longmont, Colorado 80501

Tetra Tech Job No. 133-91322-15001

December 2015



Table 2

TRI-DISTRICTS TREIBER B RESERVOIR Summary of Seepage Analyses

Station	Hydraulic Conductivity (cm/s)	Bedrock Key Depth (ft)	Liner Height (ft)	Modeled Seepage (ft ³ /day) per LF	State Engineer Allowable Seepage ¹ (ft ³ /day per LF)
Sta. 39-00	Overburden 1.0x10 ⁻⁶ Sand and Gravel 1.0x10 ⁻² Shale Bedrock 1.0x10 ⁻⁷ Slurry Wall 1.0x10 ⁻⁶	4	35	0.28	1.05
Sta. 13+00 (Treiber A Alignment)	Overburden 1.0x10 ⁻⁶ Sand and Gravel 1.0x10 ⁻² Shale Bedrock 1.0x10 ⁻⁷ Slurry Wall 1.0x10 ⁻⁶	3	34	0.32	1.02

1. State Engineer's allowable seepage rate (Design Standard) through typical maximum cross-section for each pond analyzed is obtained by multiplying allowable seepage rate of 0.03 ft³/day/ft² of liner by the height of the liner (ground surface to bottom of key).

APPENDIX C

Dewatering Analytical Solution Results

TABLE 2 CALCULATIONS

Hazen Method (Fetter 1994) Applicable to well sorted sands. Developed for slow sand filtration. Applicable to sands with 0.1mm < D10 < 3.0mm and uniformity cofficient < 5

Beyer (Kresic 2006) Applicable to poorly sorted sands with 1 < Uniformity Coeff < 20 and 0.06mm < D10 < 0.6mm

Bore	D10	D50	D60	Uniformity	Hazen	Beyer
Hole	(mm)	(mm)	(mm)	Coeff	ft/day	ft/day
BH-1	0.15	1.3	2.1	14	64	51
BH-7	0.07	1.2	2.1	30	14	9
BH-9	0.10	2.1	3.5	35	28	17
Average					35 3	26 0

Drawdown and dewatering from Marinelli and Niccoli (2000)

Ho =	15	saturated thickness above pit base at radial distance Ro from pit center (feet)			
Hp =	2	saturated thickness above pit base at pit wall, Rp (feet)			
VV =	0.001934	distributed recharge flux (feet/day)			
K =	30	horizontal hydraulic conductivity (feet/day)			
Ro =	2090	radial distance from pit center (feet)			
Rp =	600	radial distance to pit wall (feet)			

	000							
	15.04033	by iteration	(0	l	rwin/Thor	nas Mine I	Drawdown	
v			18 16 12 12					
	24338	cf/day						-
	126	gpm	oiu 14					
	from pit	Но	· 12					
0	1800	15	Saturated (Feet) 9 8 0					
0	1490	15	6 (F					
0	1490	15.04033		7				
0	1490	15.04033	E 4	1				-
0	1490	15.04033	Alluvium 0					
0	1490	15.04033		+	1	1	T	
0	1490	15.04033		0	500	1,000	1,500	2,
0	1490	15.04033		I	Distance f	rom Edge o	of Pit (feet)	
n	1460	15 03830			bistunce i	Luge C		

W = assume 15.1 in/yr precip @ 20% and 10.9 in/yr irrigation @ 50% (26 in/yr ave grass pasture requirement minus precip and 50% percolation from irrigation)

2,000

120 gpin	
from pit	Ho
1800	15
1490	15
1490	15.04033
1490	15.04033
1490	15.04033
1490	15.04033
1490	15.04033
1490	15.04033
1460	15.03839
1410	15.02642
1360	15.00328
1310	14.96859
1260	14.92197
1210	14.86293
1160	14.79095
1110	14.70541
1060	14.60562
1010	14.49077
960	14.35994
910	14.21207
860	14.04592
810	13.86006
760	13.6528
710	13.42218
	13.16583
610	12.88094
	12.56406
	12.21097
	11.81639
	11.37357
	10.87368
	10.30484
	9.650398
	8.885723
	7.971568
	6.837633
60	5.329123
10	2.874737
	from pit 1800 1490 1490 1490 1490 1490 1490 1490 1490 1490 1490 1400 1410 1360 1210 1260 1210 1160 1010 960 910 860 810 760 710 660 610 560 510 460 410 360 310 260 210 160 1010 960 910 860 810 160 110 100 10

Ho =

Q =

Pit inflow

Attachment C

- Vegetation Photographs



Photograph 1. Typical Lamb Lakes grass cover in upland areas without regular mowing



Photograph 2. Typical Lamb Lakes grass cover in upland areas with regular mowing



Photograph 3. Typical Lamb Lakes unimproved road in upland area with adjacent Kochia (sp) weed growth



Photograph 4. Typical Lamb Lakes grass cover in upland areas adjacent to unimproved roads



Photograph 5. Typical Lamb Lakes grass cover in moist areas without regular mowing and sporadic thistle growth



Photograph 6. Typical Lamb Lakes grass cover in moist areas without regular mowing



Photograph 7. Typical Lamb Lakes grasses including Wheatgrasses (sp), Smooth brome, Switchgrass, Upland Saltgrass, Alkali sacaton, and Grama (sp)

Attachment D

- Proof of Publication
- Proof of Notification to Land Owners within 200 Feet
- Proof of Structure Agreement Offers

COLORADOAN.COM | MONDAY, JULY 30, 2018 | 10



35 Volcanic

flow

36 Unemo-

tional 38 Happy

Hour

venue

8 4 5 9 1 2 3 6 7

4 5 3 2 9 7 6 1 8

9 8 2 1 6 4 7 3 5

7 1 6 8 5 3 4 9 2

Answer here: Saturday's Jumbles: TOXIN FEVER SPOOKY ISLAND Answer: After bowling a 200 game, people wanted the bowler to — STRIKE A POSE

51 Wood-

tool

52 PBS

Saturday's answer 7-30

shaping

funder 53 Beer

barrel

Text of Ad:

PUBLIC NOTICE

PUBLIC NOTICE North Weld County Water District, 32825 CR 39, Lucerne, Colorado 80646; (970) 356-3020, has filed an application for a Regular (112) Con-struction Materials Operation Recla-mation Permit with the Colorado Mined Land Reclamation Board un-der provisions of the Colorado Land der provisions of the Colorado Land Reclamation Act for the extraction of construction materials. The proposed construction materials. The proposed operation is known as Lamb Lakes and is located in or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general loca-tion of this operation is about one (1) mile north of the City of Fort Collins, Colorado and approximately 0.5 miles east of North Taft Hill Road. The proposed date of commerce-

The proposed date of commence-ment for operations included in the permit area is 2018 and the proposed date of completion is 2029. The pro-posed future use of the land is developed water storage. Additional inforoped water storage. Additional infor-mation and tentative decision date may be obtained from the Division of Reclamation, Mining and Safety; 1313 Sherman Street, Room 215, Denver, Colorado 80203, (303) 866-3567, or the Larimer County Clerk and Recorder's office, 200 W. Oak Street, Fort Collins, Colorado, 80521, (970) 498-7860 or the above-named applicant applicant.

Comments must be in writing and must be received by the Division of Reclamation, Mining, and Safety by 4:00 p.m. on September 10, 2018.

4:00 p.m. of september 10, 2018. Please note that under the provisions of C.R.S. 34-32.5-101 et seq. Com-ments related to noise, truck traffic, hours of operation, visual impacts, effects on property values and other social or economic concerns are issues not subject to this Office's jurisdiction. These subject to this office's jurisdic-tion. These subjects, and similar ones, are typically addressed by your local governments, rather than the Divi-sion of Reclamation, Mining, and Safety or the Mined Land Reclamation Éoard.

3063113

Coloradoan July 30, Aug. 6, 13, 20, 2018

PUBLIC NOTICE

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July 31, 2018

City of Fort Collins PO Box 580 Fort Collins, CO 80522-0580

Larimer County Parcel Number: 9703000943, 9703100902, 9703100945, 9703200942, 9703410901

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

Should you wish to obtain additional information regarding the project, you may contact any of the individuals indicated in the notice or **Bill Schenderlein** at (970) 227-2803.

Written responses must be forwarded to the Division of Reclamation, Mining, and Safety; 1313 Sherman Street, Room 215, Denver, Colorado 80203, (303) 866-3567, by 4:00 p.m. on September 10, 2018

Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager

Enclosure


City of Fort Collins 300 Laporte Ave Fort Collins, CO 80521

Larimer County Parcel Number: 9703100906, 9703200949

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Poudre R-1 School District 2407 Laporte Ave Fort Collins, CO 80521

Larimer County Parcel Number: 9703100907, 9703300909

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



County of Larimer – Emergency Services 1303 N Shields Street Fort Collins, CO 80524

Larimer County Parcel Number: 9703100920

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Steward, Steven Blain 2812 Tulane Dr Fort Collins, CO 80525

Larimer County Parcel Number: 9703200051

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Connell, Richard 5925 Palmer Ct Fort Collins, CO 80528

Larimer County Parcel Number: 9703205703

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



City of Greeley 1100 10th Street, #300 Greeley, CO 80631

Larimer County Parcel Number: 9703206701

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Gustafson, Randy C/Janetta F 1154 N Taft Hill Rd Fort Collins, CO 80521

Larimer County Parcel Number: 9703300001

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Arnett, Clinton D & Greiman, Selesta Jane 2401 Mapleton Cir Longmont, CO 80503

Larimer County Parcel Number: 9703409701, 9703409702

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Martin Marietta Materials Inc 1800 N Taft Hill Road Fort Collins, CO 80521

Larimer County Parcel Number: 9834000025, 9703206702

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Larimer and Weld Irrigation Co PO Box 206 Eaton, CO 80615

Larimer County Parcel Number: 9834000913

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Arthur Irrigation Company 2600 S Timberline Rd Fort Collins, CO 80525

Larimer County Parcel Number: Irrigation Canal

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Platte River Power Authority 2000 E Horsetooth Rd Fort Collins, CO 80525

Larimer County Parcel Number: High Voltage Power Transmission Lines

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



North Weld County Water District 32825 County Rd 39 Lucerne, CO 80646

Larimer County Parcel Number: 9703206701, Water Transmission Lines and Associated Infrastructure

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Poudre Valley REA 7649 REA Parkway Fort Collins, CO 80528

Larimer County Parcel Number: Overhead Utility Lines

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Written responses must be forwarded to the Division of Reclamation, Mining, and Safety; 1313 Sherman Street, Room 215, Denver, Colorado 80203, (303) 866-3567, by 4:00 p.m. on September 10, 2018

Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



East Larimer County Water District 232 South Link Lane Fort Collins, CO 80524

Larimer County Parcel Number: 9703206701, Water Transmission Lines and Associated Infrastructure

Dear Landowner/Easement Holder:

In conformance with the rules and regulations established by the Mined Land Reclamation Board, the attached notice is being sent to inform you of the North Weld County Water District application for the Lamb Lakes site. The proposed project would create developed water storage at or near Section 3, Township 7 North, Range 69 West of the 6th Prime Meridian, Larimer County, Colorado. The general location of this project is approximately one mile north of the City of Fort Collins, Colorado and approximately ¹/₂ mile east of North Taft Hill Road.

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



Fort Collins-Loveland Water District 5150 Snead Drive Fort Collins, CO 80525

Larimer County Parcel Number: 9703206701

Dear Landowner/Easement Holder:

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Sincerely, Blue Earth Solutions, LLC

William Schenderlein Project Manager



9T6E 1000

DETT

EMERGENCY SERVICES 1303 N SHIELDS STREET COUNTY OF LARIMER

8202

FORT COLLINS, CO 80524 ^{oS} Form 3800, April 20

3992 2 Article Number (Transfer from service label) 7018 JJ30 0001 3916

PS Form 3811, July 2015 PSN 7530-02-000-9053

 3. Service Type

 1. Aduit Signature

 1. Aduit Signature

 1. Certified Mail@

 1. Collect on Delivery

 1. Collect on Delivery

 1. Collect on Delivery

 1. Insured Mail

 1. Collect on Delivery

 1. Insured Mail

 1. Restricted Delivery

 Signature ConfirmationTM
 Signature Confirmation
 Restricted Delivery C Return Receipt for Merchandise

Domestic Return Receipt







SENDER: COMPLETE THIS SECTION SENDER: COMPLETE THIS SECTION - Complete items 1, 2, and 3. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the malpiece, or on the front if space permits. 1. Article Addressed to: 1. Article Addresse	COMPLETE THIS SECTION ON DELIVERY COMPLETE THIS SECTION ON DELIVERY A. Signeture A. Signeture B. Becarved by (Printed Name) G. Datopic Party B. Service Type Provinter 17 Ves Aduit Signature Prestricted Delivery Proprint Mail Expression Aduit Signature Proprint Mail Expression Proprint Mail Expression Aduit Signature Provint Mail Expression Provint Mail Expression Aduit Signature Provint Mail Expression Provint Mail Expression Aduit Signature Provint Mail Expression Provinter Mail Expression Aduit Signature Provinter Delivery Provinter Mail Expression Aduit Signature Provinter Delivery
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□ Registered Mail™ □ Registered Mail Restricted Delivery □ Return Receipt for Merchandise

Priority Mail Express®

80646

Signature Confirmation Signature Confirmation
 Restricted Delivery

Domestic Return Receipt

D Addressee

D Agent

Date of Delivery

inted Name) H-W

81-13

Nos Nes

AUG - 7. 2018





v Del	3. Service Type Incitity Mail Express@ 1. Adult Signature Registered Mail™ 1. Adult Signature Registered Mail™ 1. Adult Signature Registered Mail™ 1. Certified Mail@ Registered Mail™ 1. Contration Mail Restricted Delivery Registered Mail Restricted 1. Collect on Delivery Return Receipt for 1. Collect on Delivery Signature Confirmation™ 1. Insured Mail Restricted Delivery 1. Insured Mail Signature Confirmation™ 1. Insured Mail Restricted Delivery 1. Insured Mail Signature Confirmation™ 1. Insured Mail Restricted Delivery 1. Ower \$500) Domestic Return Receipt	A. Signature A. Signature A. Signature Agent X Agent X Addresses B. Received by (Printed Name) C. Date of Delivery B. Is delivery address different from item 1? Vss If YES, enter delivery address below: No	Service Type Priority Mail Express® Adult Signature Pestincted Mail* Adult Signature Restricted Delivery Registered Mail* Certified Mail Priority Mail Express® Certified Mail Restricted Delivery Certified Mail Restricted Delivery Collect on Delivery Restricted Delivery Collect on Delivery Restricted Delivery Insured Mail Restricted Delivery Insured Mail Signature Confirmation Insured Mail Signature Confirmation Insured Mail Signature Confirmation
 SENDER: COMPLETE THIS SECTION SENDER: COMPLETE THIS SECTION Complete items 1, 2, and 3. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the mailpiece, or on the front if space permits. 1. Article Addressed to: ARNETT, CLINTON D & GREIMAN, SELESTA JANE 2401 MAPLETON CIR, I CNGMONT, CO 80503 	2. Article Number (Transfer from service label) 2. Article Number (Transfer from service label) 2. Article Number (Transfer from service label) 2. PS Form 3811, July 2015 PSN 7530-02-000-9053	 SENDER: COMPLETE THIS SECTION SENDER: Complete items 1, 2, and 3. Complete items 1, 2, and 3. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the malipiece, or on the front if space permits. Atticle Addressed to: Atticle Addressed to: GUSTAFSON, RANDY CJANETTA F 1154 N TAFT HILL RD FORT COLLINS, CO 80521 	2. Article Number (Transfer from service label)
U.S. Postal Service U.S. Postal Service CERTIFIED MAIL® RECEIPT Domestic Mail Only Domestic Mail Only For delivery information, visit our website at www.usps.com For delivery information website at website at website at website at website at website at w		U.S. Postal Service " CERTIFIED MAIL® RECE Domestic Mail Only For delivery information, visit our website at FORT COLLINS, ICB 80521 Certified Mail Fee \$3,45 Certified Mail Fee \$3,45 Edita Services & Fees (sheet box, add fee \$10,000 Certified Mail Fee \$3,45 Certified Mai	Total Postage and Fees U3/U1/2U18 Sent To U3/U1/2U18 Sent To U3/U1/2U18 Sent To U3/U1/2U18 Sent To U3/U1/2U18 FORT COLLINS, CO 80521 U3/U1/2U18 PS Form 3800, April 2015 FSN 7530-02-000-5047 See Reverse for Instructions

8778 PS Form 3811, July 2015 PSN 7530-02-000-9053 2. Article Number (Transfer from service label) 7018 1130 0001 3916

Domestic Return Receipt

7



	COMPLETE THIS SECTION ON DELIVERY	A. Signature A. Signature X Agent B. Received by (Printed Name) C. Date of Delivery	D. Is delivery address different from item 1? □ Yes If YES, enter delivery address below: □ No			Collect on Delivery Restricted Delivery La Signature Continuation Insurred Mail Insurred Mail Insurred Mail Insurred Mail Restricted Delivery (over \$500)	Domestic Return Receipt
and the second s	SENDER: COMPLETE THIS SECTION	 Complete items 1, 2, and 3. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the mailpiece, and the droat if encode nearly is concerned. 	1. Article Addressed to:	FORT COLLINS-LOVELAND WATER DISTRICT 5150 SNEAD DRIVE FORT COLLINS, CO 80525	9590 9402 1272 5246 6365 70	2. Article Number (Transfer from service label) , 01.8 1.1.30 0001. 391.6 3527	PS Form 3811, July 2015 PSN 7530-02-000-9053



Tracking Number: 70181130000139163534

Expected Delivery by

FRIDAY

3 AUGUST by 2018 **(B)** 8:00pm (B)

C Delivered

August 3, 2018 at 11:17 am Delivered, Front Desk/Reception GREELEY, CO 80631









Letter of Transmittal

DATE: September 19, 2018

TO: Clinton Arnett and Selesta Jane Greiman 2401 Mapleton Circle Longmont, Colorado 80503

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803

WE TRANSMIT:	THE FOLLOWING:	FOR YOUR:
Attached	Originals	Use
Information Below	Copy of Letter	Approval
	Applications	Information
	Specifications	Review & Comment
	Other	

Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by you within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Since most mining on the project site has been completed and slurry wall construction is not known to affect the stability of adjacent structures, North Weld County Water District does not anticipate any structure damage. However, to ensure your interests are protected, we request that you please consider approval of a Structure Agreement. Please call me at (970) 227-2803 with any questions or to schedule a meeting for agreement revisions.

Signed: Will white

Structure Agreement

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

The following structures are located on or within 200 feet of the proposed affected area:

1.	Fencing and other agricultural infrastructure
2.	
3.	
4.	
5.	
	(Please list additional structures on a separate page)

CERTIFICATION

The Applicant, _	North	Weld County Water District	(print applicant/	company name),
by Eric Recke	entine	(print representative's name), asDis	trict Manager	(print
representative's	title), doo	es hereby certify that	Jane Greiman(structu	re owner) shall
be compensated	for any d	lamage from the proposed mining operation	n to the above listed s	structure(s)
located on or wit	thin 200 :	feet of the proposed affected area described	l within Exhibit A, of	f the Reclamation
Permit Applicati	on for	Lamb Lakes	(ope	eration name),
File Number M-	2018-03	9.		

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant		Representative Name
Date		Title
STATE OF		
COUNTY OF) ss.)	
		me this day of, 20, by
	as	of

Notary Public

NOTARY FOR STRUCTURE OWNER

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



Letter of Transmittal

- DATE: September 19, 2018
 - TO: Arthur Irrigation Company c/o John Moen 1823 Moen Ranch Road Virginia Dale, Colorado 80536
- FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803



Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by Arthur Irrigation Company within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Since most mining on the project site has been completed and slurry wall construction is not known to affect the stability of adjacent structures, North Weld County Water District does not anticipate any structure damage. However, to ensure your interests are protected, we request that you please consider approval of a Structure Agreement. Please call me at (970) 227-2803 with any questions or to schedule a meeting for agreement revisions.

Signed: Wall

Structure Agreement

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule $(6.4.20(a), and C.R.S. \$ (34-32-115(4)(d)). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

1.	Irrigation ditch and associated infrastructure
2.	
3.	
4.	
5.	
21	(Please list additional structures on a separate page)

The following structures are located on or within 200 feet of the proposed affected area:

CERTIFICATION

The Applicant, _	North W	/eld County Water District	(print a	oplicant/company name),
by_Eric Reck	entine	(print representative's name), as D	istrict Mana	ger (print
representative's	title), does	hereby certify that Arthur Ditch Con		_(structure owner) shall
be compensated	for any dar	nage from the proposed mining operation	on to the abov	e listed structure(s)
located on or wi	thin 200 fee	et of the proposed affected area describe	ed within Exhi	bit A, of the Reclamation
Permit Applicati	ion for <u>L</u> a	ımb Lakes		(operation name),
File Number M-	2018-039			

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant	Representative Name
Date	Title
STATE OF)	
COUNTY OF)	3.
	d before me this day of, 20, by
	My Commission Expires:

Notary Public

NOTARY FOR STRUCTURE OWNER

Structure Owner	Name
Date	Title
STATE OF)	
COUNTY OF)	S.
The foregoing was acknowledge as	d before me this day of, 20, by
Notary Public	My Commission Expires:



Letter of Transmittal

DATE: September 19, 2018			
TO: City of Fort Collins 300 Laporte Avenue Fort Collins, Colora			
FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803			
WE TRANSMIT:	THE FOLLOWING:	FOR YOUR:	
Attached	Originals	Use	
Information Below	Copy of Letter	Approval	
	Applications	Information	
	Specifications	Review & Comment	
	Other		

Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by the City of Fort Collins within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Since most mining on the project site has been completed and slurry wall construction is not known to affect the stability of adjacent structures, North Weld County Water District does not anticipate any structure damage. However, to ensure your interests are protected, we request that you please consider approval of a Structure Agreement. Please call me at (970) 227-2803 with any questions or to schedule a meeting for agreement revisions.

Signed: Will white

Structure Agreement

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule $(6.4.20(a), and C.R.S. \$ (34-32-115(4)(d)). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

The following structures are located on or within 200 feet of the proposed affected area:

1.	Property fencing, gates, and bridges associated with old railroad grade		
2.			
3.			
4.			
5.			
	(Please list additional structures on a separate page)		
The Applicant, _	North \	Neld County Water District	(print applicant/company name),
--------------------	--------------	---	--
by_Eric Recke	entine	(print representative's name), as Dis	strict Manager (print
representative's	title), does	s hereby certify that City of Fort Colling	
be compensated	for any da	mage from the proposed mining operation	n to the above listed structure(s)
located on or with	thin 200 fe	eet of the proposed affected area described	d within Exhibit A, of the Reclamation
Permit Applicati	on for	amb Lakes	(operation name),
File Number M-	2018-039		

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant		Representative Name
Date		Title
STATE OF	X	
COUNTY OF) ss.)	
		me this day of, 20, by
	as	of

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



DATE: September 19, 2018

TO: City of Fort Collins Utilities PO Box 580 Fort Collins, Colorado 80522

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803

WE TRANSMIT:	THE FOLLOWING:	FOR YOUR:
Attached	Originals	Use
Information Below	Copy of Letter	Approval
	Applications	Information
	Specifications	Review & Comment
	Other	

Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by the City of Fort Collins within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Signed: Will which

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

The following structures are located on or within 200 feet of the proposed affected area:

Poudre Trail and associated fencing and gates

1.

2. Property line fence
3. Utility easement and associated structures
3. Buried sewer line
5. (Please list additional structures on a separate page)

The Applicant, _	North \	Neld County Water District	(print applicant/company name),
by_Eric Recke	entine	(print representative's name), as Dis	strict Manager (print
representative's	title), does	s hereby certify that City of Fort Colling	
be compensated	for any da	mage from the proposed mining operation	n to the above listed structure(s)
located on or with	thin 200 fe	eet of the proposed affected area described	d within Exhibit A, of the Reclamation
Permit Applicati	on for	amb Lakes	(operation name),
File Number M-	2018-039		

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant		Representative Name
Date		Title
STATE OF	X	
COUNTY OF) ss.)	
		me this day of, 20, by
	as	of

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



DATE: September 19, 2018

TO: Richard Connell c/o Connell Resources, Inc. / Attn: Kevin Anderson 7785 Highland Meadows Parkway Fort Collins, Colorado 80528

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803



Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by you within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Signed: Will

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule $(6.4.20(a), and C.R.S. \$ (34-32-115(4)(d)). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

1.	Fencing and other mine reclamation infrastructure
2.	
3.	
4.	
5.	
	(Please list additional structures on a separate page)

The following structures are located on or within 200 feet of the proposed affected area:

The Applicant, _	North V	Veld County Water District	(print applicant/company nam	e),
by_Eric Recke	entine	(print representative's name), as Dis	strict Manager (pri	nt
representative's	title), does	hereby certify that Richard Connell	(structure owner) shal	11
be compensated	for any da	mage from the proposed mining operatio	on to the above listed structure(s)	
located on or wit	thin 200 fe	eet of the proposed affected area describe	ed within Exhibit A, of the Reclamat	ion
Permit Applicati	on for	amb Lakes	(operation name),	
File Number M-	2018-039			

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant		Representative Name
Date		Title
STATE OF	X	
COUNTY OF) ss.)	
		me this day of, 20, by
	as	of

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



DATE: September 19, 2018

TO: East Larimer County Water District Attn: Mike Scheid 232 S. Link Lane Fort Collins, Colorado 80524

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803



Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by East Larimer County Water District within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Signed: Will

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

	The following structures are located on or within 200 feet of the proposed affected area:
1.	Fencing and other mine reclamation and water infrastructure
2.	Buried water lines and associated infrastructure
3.	
4.	
5.	(Please list additional structures on a separate page)

The Applicant, _	North V	Veld County Water District	(print applicant/company r	1ame),
by_Eric Recke	entine	(print representative's name), as D	istrict Manager	(print
representative's	title), does	hereby certify that		shall
be compensated	for any da	mage from the proposed mining operation	on to the above listed structure(s))
located on or wit	hin 200 fe	et of the proposed affected area describe	ed within Exhibit A, of the Reclar	mation
Permit Application	on for <u>L</u> a	amb Lakes	(operation nam	ne),
File Number M-2	2018-039			

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant	Representative Name
Date	Title
STATE OF)	
COUNTY OF)	3.
	d before me this day of, 20, by
	My Commission Expires:

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



DATE: September 19, 2018

TO: Fort Collins-Loveland Water District Attn: Chris Matkins 232 S. Link Lane Fort Collins, Colorado 80524

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803



Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by Fort Collins-Loveland Water District within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Signed: Will

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

1.	Fencing and other mine reclamation and water infrastructure
2.	
3.	
4.	
5.	
	(Please list additional structures on a separate page)

The following structures are located on or within 200 feet of the proposed affected area: Fencing and other mine reclamation and water infrastructure

The Applicant, _	North V	Veld County Water District	(print applicant/company n	name),
by Eric Recke	entine	(print representative's name), as	istrict Manager	(print
representative's	title), does	hereby certify that Fort Collins-Loveland		shall
be compensated	for any dat	mage from the proposed mining operati	on to the above listed structure(s))
located on or within 200 feet of the proposed affected area described within Exhibit A, of the Reclamation				
Permit Applicati	on for	amb Lakes	(operation nan	ne),
File Number M-	2018-039			

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant	Representative Name
Date	Title
STATE OF)	
COUNTY OF)	3.
	d before me this day of, 20, by
	My Commission Expires:

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



DATE: September 19, 2018

TO: City of Greeley Attn: Jennifer Petrzelka 1100 10th Street, #300 Greeley, Colorado 80631

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803



Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by the City of Greeley within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Signed: Will

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

1.	Fencing and other mine reclamation and water infrastructure
2.	
3.	
4.	
5.	
	(Please list additional structures on a separate page)

The following structures are located on or within 200 feet of the proposed affected area: Fencing and other mine reclamation and water infrastructure

The Applicant, _	North W	Veld County Water District	(print applicant/co	ompany name),
by_Eric Recke	entine	(print representative's name), as D	istrict Manager	(print
representative's	title), does	hereby certify that City of Greeley		owner) shall
be compensated	for any dar	mage from the proposed mining operati	on to the above listed str	ucture(s)
located on or with	thin 200 fee	et of the proposed affected area describe	ed within Exhibit A, of th	he Reclamation
Permit Applicati	on for <u>La</u>	amb Lakes	(opera	ation name),
File Number M-	2018-039			

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant		Representative Name
Date		Title
STATE OF	X	
COUNTY OF) ss.)	
		me this day of, 20, by
	as	of

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



DATE: September 19, 2018

TO: Randy and Janetta Gustafson 1154 N Taft Hill Road Fort Collins, Colorado 80521

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803

WE TRANSMIT:	THE FOLLOWING:	FOR YOUR:
Attached	Originals	Use
Information Below	Copy of Letter	Approval
	Applications	Information
	Specifications	Review & Comment
	Other	

Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by you within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Signed: Will white

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

The following structures are located on or within 200 feet of the proposed affected area:

1.	Fencing and other agricultural infrastructure
2.	
3.	
4.	
5.	
	(Please list additional structures on a separate page)

The Applicant, _	North V	Veld County Water District	(print ap	plicant/company name),
by_Eric Reck	entine	(print representative's name), as	istrict Manag	ger (print
representative's	title), does	hereby certify that Randy and Janett		(structure owner) shall
be compensated	for any dar	mage from the proposed mining operati	ion to the above	e listed structure(s)
located on or wi	thin 200 fee	et of the proposed affected area describ	ed within Exhi	bit A, of the Reclamation
Permit Applicati	ion for <u>L</u> a	amb Lakes		(operation name),
File Number M-	2018-039			

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant		Representative Name
Date		Title
STATE OF)	
COUNTY OF) ss.)	
The foregoing was ack	nowledged before	me this day of, 20, by
		My Commission Expires:

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



DATE: September 19, 2018

TO: Larimer and Weld Irrigation Company PO Box 206 Eaton, Colorado 80615

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803

WE TRANSMIT:	THE FOLLOWING:	FOR YOUR:
Attached	Originals	Use
Information Below	Copy of Letter	Approval
	Applications	Information
	Specifications	Review & Comment
	Other	

Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by Larimer and Weld Irrigation Company within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Signed: Will la la la

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(*a*), Rule 6.4.19(*a*), and C.R.S. § 34-32.5-115(4)(*e*) and with Hard Rock/Metal Mining Rule 6.3.12(*a*), Rule 6.4.20(*a*), and C.R.S. § 34-32-115(4)(*d*). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

1.	Grade control structure
2.	
3.	
4.	
5.	
	(Please list additional structures on a separate page)

The following structures are located on or within 200 feet of the proposed affected area:

The Applicant, _	North W	/eld County Water District	(print applicant/compa	ny name),
by Eric Recke	entine	(print representative's name), as	District Manager	(print
representative's	title), does	hereby certify that Larimer and Weld In	rigation Company (structure own	ner) shall
be compensated for any damage from the proposed mining operation to the above listed structure(s)				
located on or within 200 feet of the proposed affected area described within Exhibit A, of the Reclamation				
Permit Applicati	on for La	amb Lakes	(operation	name),
File Number M-	2018-039			

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant	Representative Name
Date	Title
STATE OF)	
COUNTY OF)	3.
	d before me this day of, 20, by
	My Commission Expires:

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



DATE: September 19, 2018

TO: Larimer County Emergency Services 1303 N. Shields Street Fort Collins, Colorado 80524

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803

WE TRANSMIT:	THE FOLLOWING:	FOR YOUR:
Attached	Originals	Use
Information Below	Copy of Letter	Approval
	Applications	Information
	Specifications	Review & Comment
	Other	

Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by Larimer County Emergency Services within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Signed: Will la la

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

The following structures are located on or within 200 feet of the proposed affected area:

1.	Fencing and other open space infrastructure
2.	
3.	
4.	
5	
э.	(Please list additional structures on a separate page)

The Applicant, _	North	Weld County Water District	(print applicant/company name)
by_Eric Recke	entine	(print representative's name), as Dis	strict Manager(print
representative's	title), doe	s hereby certify that Larimer County	(structure owner) shall
be compensated	for any da	amage from the proposed mining operation	n to the above listed structure(s)
located on or with	thin 200 f	eet of the proposed affected area described	d within Exhibit A, of the Reclamation
Permit Applicati	on for	.amb Lakes	(operation name),
File Number M-	2018-039	<u> . </u>	

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant		_ Representative Name	
Date		Title	
STATE OF			
COUNTY OF) ss.)		
		me this day of, 20, by	
	as	of	

Structure Owner	Name
Date	Title
STATE OF)	
COUNTY OF)	S.
The foregoing was acknowledge as	d before me this day of, 20, by
Notary Public	My Commission Expires:



DATE: September 19, 2018

TO: Ms. Julie Mikulas Martin Marietta Materials 1800 North Taft Hill Road Fort Collins, Colorado 80521

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803



Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by Martin Marietta Materials within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Signed: Will

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

	The following structures are located on or within 200 feet of the proposed affected area: Mining infrastructure including electrical lines, pumps, piping, fencing,
1.	
2.	and other man-made structures.
3.	
4.	
5.	(Please list additional structures on a separate page)
CERTIFICATION

The Applicant, _	North V	Veld County Water District	(print ap	oplicant/company name),
by_Eric Recke	entine	(print representative's name), as Di	istrict Mana	ger (print
representative's	title), does	hereby certify that Martin Marietta N		(structure owner) shall
be compensated	for any dat	mage from the proposed mining operation	on to the above	e listed structure(s)
located on or wi	thin 200 fe	et of the proposed affected area describe	ed within Exhi	bit A, of the Reclamation
Permit Applicati	ion for	reiber Lakes		(operation name),
File Number M-	2018-039	<u>.</u>		

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant	Representative Name
Date	Title
STATE OF)	
COUNTY OF)	3.
	d before me this day of, 20, by
	My Commission Expires:

Notary Public

NOTARY FOR STRUCTURE OWNER

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



Letter of Transmittal

DATE: September 19, 2018

TO: Platte River Power Authority Attn: Gary Wittenberg and Mark Curtis 2000 East Horsetooth Fort Collins, Colorado 80525

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803



Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by Platte River Power Authority within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Since most mining on the project site has been completed and slurry wall construction is not known to affect the stability of adjacent structures, North Weld County Water District does not anticipate any structure damage. However, to ensure your interests are protected, we request that you please consider approval of a Structure Agreement. Please call me at (970) 227-2803 with any questions or to schedule a meeting for agreement revisions.

Signed: Will

Structure Agreement

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule $(6.4.20(a), and C.R.S. \$ (34-32-115(4)(d)). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

The followin	ig structures	are located on	or within 20	0 feet of the propose	d affected area:

1.	
2.	
3.	
4.	
5.	
	(Please list additional structures on a separate page)

Overhead power transmission lines and poles

CERTIFICATION

The Applicant, _	North W	/eld County Water District	(print applicant/compar	ıy name),
by_Eric Recke	entine	(print representative's name), as	District Manager	(print
representative's	title), does	hereby certify that Platte River Pov		er) shall
be compensated	for any dar	nage from the proposed mining operat	ion to the above listed structure	e(s)
located on or wi	thin 200 fee	et of the proposed affected area describ	ed within Exhibit A, of the Re	clamation
Permit Applicati	on for La	amb Lakes	(operation t	name),
File Number M-	2018-039			

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant		Representative Name
Date		Title
STATE OF)	
COUNTY OF) ss.)	
The foregoing was ack	nowledged before	me this day of, 20, by
		My Commission Expires:

Notary Public

NOTARY FOR STRUCTURE OWNER

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



Information

Review & Comment

Letter of Transmittal

2407 Laporte Avenu	DATE: September 19, 2018 TO: Poudre R-1 School District 2407 Laporte Avenue Fort Collins, Colorado 80521				
FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803					
WE TRANSMIT:	THE FOLLOWING:	FOR YOUR:			
Attached	Originals	Use			
Information Below	Copy of Letter	Approval			
	Applications	Information			

Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

Specifications

Other

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by Poudre R-1 School District within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Since most mining on the project site has been completed and slurry wall construction is not known to affect the stability of adjacent structures, North Weld County Water District does not anticipate any structure damage. However, to ensure your interests are protected, we request that you please consider approval of a Structure Agreement. Please call me at (970) 227-2803 with any questions or to schedule a meeting for agreement revisions.

Signed: Will when

Structure Agreement

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

The following structures are located on or within 200 feet of the proposed affected area: Fencing, un-improved roads, and other open space infrastructure

1.	
2.	Easement
3.	
4.	
5.	
	(Please list additional structures on a separate page)

CERTIFICATION

The Applicant, _	North W	/eld County Water District	(print a	pplicant/company name),
by_Eric Recke	entine	(print representative's name), as	District Mana	ger (print
representative's	title), does	hereby certify that Poudre R-1 Sch		_(structure owner) shall
be compensated	for any dar	nage from the proposed mining operat	ion to the abov	e listed structure(s)
located on or wi	thin 200 fee	et of the proposed affected area describ	ed within Exh	ibit A, of the Reclamation
Permit Applicati	ion for La	amb Lakes		(operation name),
File Number M-	2018-039			

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant	Representative Name
Date	Title
STATE OF)	
COUNTY OF)	3.
	d before me this day of, 20, by
	My Commission Expires:

Notary Public

NOTARY FOR STRUCTURE OWNER

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



Letter of Transmittal

DATE: September 19, 2018

TO: Poudre Valley REA Attn: Matt Organ 7649 REA Parkway Fort Collins, Colorado 80528

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803



Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by Poudre Valley REA within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Since most mining on the project site has been completed and slurry wall construction is not known to affect the stability of adjacent structures, North Weld County Water District does not anticipate any structure damage. However, to ensure your interests are protected, we request that you please consider approval of a Structure Agreement. Please call me at (970) 227-2803 with any questions or to schedule a meeting for agreement revisions.

Signed: Wall

Structure Agreement

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

The following structures are located on or within 200 feet of the proposed affected area:

1.	Overhead power/utility lines and poles
2.	
3.	
4.	
5.	(Diagon list additional structures on a compacto page)
	(Please list additional structures on a separate page)

CERTIFICATION

The Applicant,	North V	Neld County Water District	(print ap	plicant/company name),		
by_Eric Reck	entine	(print representative's name), as D	istrict Manag	ger (print		
representative's	title), does	s hereby certify that Poudre Valley R		(structure owner) shall		
be compensated for any damage from the proposed mining operation to the above listed structure(s)						
located on or wi	thin 200 fe	eet of the proposed affected area describe	ed within Exhi	bit A, of the Reclamation		
Permit Applicati	ion for <u>L</u>	amb Lakes		(operation name),		
File Number M-	2018-039					

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant		Representative Name
Date		Title
STATE OF	X	
COUNTY OF) ss.)	
		me this day of, 20, by
	as	of

Notary Public

NOTARY FOR STRUCTURE OWNER

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



Letter of Transmittal

DATE: October 3, 2018

TO: Steven Blain Steward 2812 Tulane Dr Fort Collins, Colorado 80525

FROM: Bill Schenderlein Blue Earth Solutions, LLC P.O. Box 2427 Fort Collins, Colorado 80522 (970) 227-2803

WE TRANSMIT:	THE FOLLOWING:	FOR YOUR:
Attached	Originals	Use
Information Below	Copy of Letter	Approval
	Applications	Information
	Specifications	Review & Comment
	Other	

Remarks:

North Weld County Water District is in the process of obtaining a Colorado Division of Reclamation, Mining and Safety (DRMS) permit for the reclamation of three historic Martin Marietta Materials gravel pits in Larimer County (see Vicinity Map). The reclamation will involve slurry wall construction around the existing mine pit lakes to create below-grade water storage reservoirs.

As part of the DRMS permitting, North Weld County Water District has identified permanent manmade structures owned by you within or adjacent to the project. To protect your interests in the structures, North Weld County Water District is requesting an agreement that provides you with compensation for structure damage. A typical agreement is attached.

Since most mining on the project site has been completed and slurry wall construction is not known to affect the stability of adjacent structures, North Weld County Water District does not anticipate any structure damage. However, to ensure your interests are protected, we request that you please consider approval of a Structure Agreement. Please call me at (970) 227-2803 with any questions or to schedule a meeting for agreement revisions.

Signed: Will white

Structure Agreement

This letter has been provided to you as the owner of a structure on or within two hundred (200) feet of a proposed mine site. The State of Colorado, Division of Reclamation, Mining and Safety ("Division") requires that where a mining operation will adversely affect the stability of any significant, valuable and permanent man-made structure located within two hundred (200) feet of the affected land, the Applicant shall either:

- a) Provide a notarized agreement between the Applicant and the Person(s) having an interest in the structure, that the Applicant is to provide compensation for any damage to the structure; or
- b) Where such an agreement cannot be reached, the Applicant shall provide an appropriate engineering evaluation that demonstrates that such structure shall not be damaged by activities occurring at the mining operation; or
- c) Where such structure is a utility, the Applicant may supply a notarized letter, on utility letterhead, from the owner(s) of the utility that the mining and reclamation activities, as proposed, will have "no negative effect" on their utility. (*Construction Materials Rule 6.3.12 and Rule 6.4.19 & Hard Rock/Metal Mining Rule 6.3.12 and Rule 6.4.20*)

The Colorado Mined Land Reclamation Board ("Board") has determined that this form, if properly executed, represents an agreement that complies with Construction Materials Rule 6.3.12(a), Rule 6.4.19(a), and C.R.S. § 34-32.5-115(4)(e) and with Hard Rock/Metal Mining Rule 6.3.12(a), Rule 6.4.20(a), and C.R.S. § 34-32-115(4)(d). This form is for the sole purpose of ensuring compliance with the Rules and Regulations and shall not make the Board or Division a necessary party to any private civil lawsuit to enforce the terms of the agreement or create any enforcement obligations in the Board or the Division.

The following structures are located on or within 200 feet of the proposed affected area:

1.	Fencing and other agricultural infrastructure
2.	
3.	
4.	
5.	
	(Please list additional structures on a separate page)

CERTIFICATION

The Applicant, _	North V	Veld County Water District	(print applicant/company name),		
by_Eric Reck	entine	(print representative's name), as Dist	rict Manager(print		
representative's	title), does	s hereby certify that Steven Blain Stewa			
be compensated for any damage from the proposed mining operation to the above listed structure(s)					
located on or wi	thin 200 fe	eet of the proposed affected area described	within Exhibit A, of the Reclamation		
Permit Applicati	on for	amb Lakes	(operation name),		
File Number M-	2018-039				

This form has been approved by the Colorado Mined Land Reclamation Board pursuant to its authority under the Colorado Land Reclamation Act for the Extraction of Construction Materials and the Colorado Mined Land Reclamation Act for Hard Rock, Metal, and Designated Mining Operations. Any alteration or modification to this form shall result in voiding this form.

NOTARY FOR PERMIT APPLICANT

Applicant		Representative Name
Date		Title
STATE OF	X	
COUNTY OF) ss.)	
		me this day of, 20, by
	as	of

Notary Public

NOTARY FOR STRUCTURE OWNER

Structure Owner	Name
Date	Title
STATE OF)	
) si COUNTY OF)	S.
The foregoing was acknowledgeas	d before me this day of, 20, by
Notary Public	My Commission Expires:



	COMPLETE THIS SECTION ON DELIVERY	× and the addressee	B. Received by (Printed Name) V C. Date of Delivery	D. Is delivery address different from item 1? □ Yes If YES, enter delivery address below: □ No		3. Service Type 4dult Signature Adult Signature Adult Signature Restricted Delivery Certified Mail® Certified Mail® Certified Mail® Certified Mail® Certified Mail® Certified Mail® Certified Delivery Metchandlee	Collect on Delivery Restricted Delivery Signature Confirmation Aail Aail Restricted Delivery Restricted Delivery Restricted Delivery Action	Domestic Return Receipt
A CONTRACT OF	SENDER: COMPLETE THIS SECTION	 Complete items 1, 2, and 3. Print your name and address on the reverse so that we can return the card to volu. 	 Attach this card to the back of the mailpiece, or on the front if space permits. 	1. Article Addressed to:	FORT COLLINS-LOVELAND WATER DISTRICT 5150 SNEAD DRIVE FORT COLLINS, CO 80525	9590 9402 1272 5246 6364 95	701.7 1.000 0000 3646 0379	PS Form 3811, July 2015 PSN 7530-02-000-9053



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S Form 3800, April

City, State



Domestic Mail Only 29ED



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COMPLETE THIS SECTION ON DELIVERY A. Signature A. Solution A. Solution A. Solution A. Solution A. Solution B. Solution A. Solution A. Solution B. Solution A. Solution A. Solution A. Solution A. Solution B. Solution A. Solution A. Solution A. Solution A. Solution A. Solution	3. Service Type Priority Mail Express@ 1 Aduit Signature Pestificand Mail™ 2 Aduit Signature Restricted Delivery Pestificand Mail™ 2 Aduit Signature Restricted Delivery Profit Mail Express@ 1 Aduit Signature Confirmation Periority Mail Express@ 2 Aduit Signature Confirmation Mail Restricted 1 Collect on Delivery Delivery 2 Collect on Delivery Signature Confirmation 1 Aduit Restricted Delivery Signature Confirmation	ComPLETE THIS SECTION ON DELIVERY ComPLETE THIS SECTION ON DELIVERY A. Signaturé A. Signaturé B. Beceréréd by (Printed Name) B. Service Type Aduit Signature Certified Matiles Continted Delivery B. Service Type Aduit Signature Certified Matiles Continted Delivery Begistered Mail Begistered Delivery Begistered Delivery Bestricted Delivery Bornestic Return Receipt for
SENDER: COMPLETE THIS SECTION SENDER: COMPLETE THIS SECTION Complete items 1, 2, and 3. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the mailpiece, or on the front if space permits. 1. Article Addressed to: CITY OF FORT COLLINS 300 LAPORTE AVE FORT COLLINS, CO 80521	9 Addiely Minister from service label	PS Form 3811, July 2015 PSN 7530-02-000-9053 SENDER: COMPLETE THIS SECTION Complete items 1, 2, and 3. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the malipiece, or on the front if space permits. 1. Article Addressed to: CITY OF FORT COLLINS PO BOX 580 FORT COLLINS, CO 80522-0580 FORT COLLINS, FORT FORT FORT FORT FORT FORT FORT FORT
CER Domes For delli For delli For delli For delli For delli For delli Safatti Sign Dadut Sign Corrited Ma	P CITY OF FORT COLLINS Street and 300 LAPORTE AVE FORT COLLINS, CO 80321 City, State PS Form 3800, April 2015 PSN 7880-02-000-0047 See Reverse for Instructions	Description



USPS Tracking[®]

FAQs > (https://www.usps.com/faqs/uspstracking-faqs.htm)

U.S. Postal Service

Track Another Package +

Tracking Number: 70170190000061178404

Remove X

This is a reminder to arrange for redelivery of your item before October 15, 2018 or your item will be returned on October 16, 2018. You may arrange redelivery by using the Schedule a Redelivery feature on this page or may pick up the item at the Post Office indicated on the notice.

	HDH	CERTIFIED MAIL [®] REC Domestic Mail Only	EIPT
Delivery Attempt: Action Needed		For delivery information, visit our website at www.usps.com*.	
Reminder to Schedule Redelivery of your item before October 15, 2018	r-	LIVERMORE CO 80536 A	USE
Schedule Redelivery V	611	Certified Mail Fee \$ \$3.45 Extra Services & Fees (check box, add fee a address at the services	0197
		Return Receipt (hardcopy) Seturn Receipt (electronic) Seturn Receipt (electronic)	Postmark 40
Text & Email Updates	00 06	Certified Mail Restricted Delivery \$ \$0.00 Calut Signature Required \$ \$0.00 Adult Signature Restricted Delivery \$ \$0.00 Postage \$ \$0.71	27 286 5 8 2018 22
Schedule Redelivery	7 01	Total Postage and Fees \$ \$6.91	09/26/2018
Tracking History	TOZ	Steel 10 ARTHUR IRRIGATION COMPAN Street and Api 1823 MOEN RANCH RD 1823 MOEN RANCH RD VIRGINIA DALE, CO 80536	NY
		PS Form 3800, April 2015 PSN 7530-02-000-9047	See Reverse for Instructions

Reminder to Schedule Redelivery of your item before October 15, 2018

This is a reminder to arrange for redelivery of your item before October 15, 2018 or your item will be returned on October 16, 2018. You may arrange redelivery by using the Schedule a Redelivery feature on this page or may pick up the item at the Post Office indicated on the notice.

October 1, 2018 In Transit to Next Facility

October 1, 2018, 11:12 am Notice Left (No Authorized Recipient Available) LIVERMORE, CO 80536

September 28, 2018, 6:49 pm Departed USPS Regional Facility DENVER CO DISTRIBUTION CENTER

USPS Tracking[®]

FAQs > (https://www.usps.com/faqs/uspstracking-faqs.htm)

Track Another Package +

Tracking Number: 7017100000036460478

Remove X

This is a reminder to arrange for redelivery of your item before October 18, 2018 or your item will be returned on October 19, 2018. You may arrange redelivery by using the Schedule a Redelivery feature on this page or may pick up the item at the Post Office indicated on the notice.

Delivery Attempt: Action Needed Reminder to Schedule Redelivery of your item before October 18, 3 Schedule Redelivery V		For delivery information, visit our website at www.usps.com FORT COLLINS: CO 80525 Certified Mail Fee \$ \$2,75 S Extra Services & Fees (check box, add fee as appropriate) Beturn Receipt (hardcopy)	
Text & Email Updates		turn Receipt (electronic) \$ <u>\$0.00</u> rtified Mail Restricted Delivery \$ uit Signature Required \$ uit Signature Restricted Delivery \$	Postmark
Schedule Redelivery	15	³⁹ \$0.71 Postage and Fees \$6.91	10/03/2018
Tracking History	Sent T Street City, S	2812 TULANE DR FORT COLLINS, CO 80525	
	PS F	orm 3800, April 2015 PSN 7530-02-000-9047	See Reverse for Instructions

Reminder to Schedule Redelivery of your item before October 18, 2018

This is a reminder to arrange for redelivery of your item before October 18, 2018 or your item will be returned on October 19, 2018. You may arrange redelivery by using the Schedule a Redelivery feature on this page or may pick up the item at the Post Office indicated on the notice.

October 4, 2018, 4:20 pm Notice Left (No Authorized Recipient Available) FORT COLLINS, CO 80525

October 4, 2018 In Transit to Next Facility

October 3, 2018, 3:02 pm USPS in possession of item FORT COLLINS, CO 80521

USPS Tracking[®]

FAQs > (https://www.usps.com/faqs/uspstracking-faqs.htm)

Track Another Package +

Tracking Number: 7017100000036460454

Remove X

Your package will arrive later than expected, but is still on its way. It is currently in transit to the next facility.

In-Transit	U.S. Postal Service [™] CERTIFIED MAIL [®] RECEIPT Domestic Mail Only	
September 29, 2018 In Transit to Next Facility	For delivery information, visit our website at www.usps.com [®] .	
Get Updates V	Image: Signed State 0197 Extra Services & Fees (check box, add fee a pproprist) 0197 Return Receipt (hardcopy) \$ Return Receipt (electronic) \$ Certified Mail Restricted Delivery \$ Adult Signature Restricted Delivery \$ Adult Signature Restricted Delivery \$	Feedback
Text & Email Updates	Postage \$ \$0.71 Total Postage and Fees 09/26/2018	/ ack
Tracking History	Sent ⁷⁷ POUDRE VALLEY REA Stree 7649 REA PARKWAY FORT COLLINS, CO 80528	`
September 29, 2018	PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions	

In Transit to Next Facility

Your package will arrive later than expected, but is still on its way. It is currently in transit to the next facility.

September 29, 2018, 9:27 am

Delivery Attempted - No Access to Delivery Location FORT COLLINS, CO 80528

September 27, 2018, 3:00 pm

Departed USPS Regional Facility DENVER CO DISTRIBUTION CENTER

September 27, 2018, 12:13 am

Arrived at USPS Regional Facility DENVER CO DISTRIBUTION CENTER

September 26, 2018, 8:29 pm Departed Post Office FORT COLLINS, CO 80521

USPS Tracking[®]

FAQs > (https://www.usps.com/faqs/uspstracking-faqs.htm)

Track Another Package +

Tracking Number: 7017100000036460416

Remove X

Your item arrived at the FORT COLLINS, CO 80521 post office at 11:04 am on October 11, 2018 and is ready for pickup.

Available for Pickup	U.S. Postal Service [™] CERTIFIED MAIL [®] RECEIPT Domestic Mail Only For delivery information, visit our website at www.usps.com [®] .	
October 11, 2018 at 11:04 am Available for Pickup FORT COLLINS, CO 80521	FOR COLLINS, CO 80524 L USE Certified Mail Fee \$ \$3.45 Extra Services & Fees (deck by addition to compare to b) 0197	
Get Updates V	Return Receipt (electronic) S Certified Mail Restricted Delivery Adult Signature Required S Adult Signature Restricted Delivery S Adult Signature Restricted Delivery	Feedback
Text & Email Updates	Postage \$ \$0.71 Total Postage and Pede \$ \$6.91 09/26/2018	~ *
Tracking History	Sent Tr COUNTY OF LARIMER - Sireet EMERGENCY SERVICES 1303 N SHIELDS STREET City:" FORT COLLINS, CO 80524	^
October 11, 2018, 11:04 am	PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instruction	s

Available for Pickup FORT COLLINS, CO 80521

Your item arrived at the FORT COLLINS, CO 80521 post office at 11:04 am on October 11, 2018 and is ready for pickup.

Reminder to Schedule Redelivery of your item

September 28, 2018, 3:15 pm Notice Left (No Authorized Recipient Available) FORT COLLINS, CO 80525

September 28, 2018, 9:27 am Out for Delivery FORT COLLINS, CO 80524

September 28, 2018, 9:17 am Sorting Complete

USPS Tracking[®]

FAQs > (https://www.usps.com/faqs/uspstracking-faqs.htm)

Track Another Package +

Tracking Number: 7017100000036460393

Remove X

Your item arrived at the FORT COLLINS, CO 80521 post office at 11:43 am on October 12, 2018 and is ready for pickup.

	U.S. Postal Service [™] CERTIFIED MAIL [®] RECEIPT	
Available for Pickup	For delivery information, visit our website at www.usps.com [®] .	
October 12, 2018 at 11:43 am Available for Pickup FORT COLLINS, CO 80521 Get Updates V	For delivery information, visit our website at www.usps.com*. FUR CULLINS; C0 80521 Certified Mail Fee Certified Mail Fee \$ \$2,75 Extra Services & Fees (check box, add fee as the propriete) Return Receipt (hardcopy) Return Receipt (electronic) Cartified Mail Restricted Delivery Cartified Mail Restricted Delivery Adult Signature Required Adult Signature Restricted Delivery	Feedback
Text & Email Updates	Postage \$0.71 100/26/2018 Total Postage and 565.91	×
Tracking History	Sent ^{Tr} GUSTAFSON, RANDY C/JANETTA F Stree 1154 N TAFT HILL RD FORT COLLINS, CO 80521 City.	`
October 12, 2018, 11:43 am	PS Form 3800, April 2015 PSN/7500-02-000-9047 See Reverse for Instructions	

Available for Pickup FORT COLLINS, CO 80521

Your item arrived at the FORT COLLINS, CO 80521 post office at 11:43 am on October 12, 2018 and is ready for pickup.

October 5, 2018, 2:43 pm

Notice Left (No Authorized Recipient Available) FORT COLLINS, CO 80521

Reminder to Schedule Redelivery of your item

October 3, 2018, 1:28 pm Available for Pickup FORT COLLINS, CO 80522

September 29, 2018, 2:09 pm Notice Left (No Authorized Recipient Available)

USPS Tracking[®]

FAQs > (https://www.usps.com/faqs/uspstracking-faqs.htm)

Track Another Package +

Tracking Number: 70171000000036460386

Remove X

Your item was delivered to the front desk or reception area at 10:30 am on October 9, 2018 in GREELEY, CO 80631.

𝞯 Delivered	U.S. Postal Service [™] CERTIFIED MAIL [®] RECEIPT	
October 9, 2018 at 10:30 am Delivered, Front Desk/Reception GREELEY, CO 80631	For delivery information, visit our website at www.usps.com ^o . GREELEY: CO 80631 ALUSE Certified Mail Fee #7 /5	
Get Updates 🏏	Extra Services & Fees (check box, add fee at appropriate) Return Receipt (hardcopy) Return Receipt (electronic) Gertified Mail Restricted Delivery Aduit Signature Required	Feedback
Text & Email Updates	Adult Signature Restricted Delivery \$_\$0.00 Postage \$\$\$\$\$\$0.71 Total Postage and Fees \$	~ ^{ack}
Tracking History	Sent Tr CITY OF GREELEY 1100 10TH STREET, #300 GREELEY, CO 80631 City; 2	
October 9, 2018, 10:30 am Delivered, Front Desk/Reception	PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instruction	s

 PS Form 3800, April 2015 PSN 7530-02-000-0047
 See Reverse for Instru

 GREELEY, CO 80631
 Your item was delivered to the front desk or reception area at 10:30 am on October 9, 2018 in GREELEY, CO 80631.

October 8, 2018 In Transit to Next Facility

October 5, 2018, 12:51 pm Arrived at USPS Regional Facility DENVER CO DISTRIBUTION CENTER

October 3, 2018, 7:58 pm Departed USPS Regional Facility COLORADO SPRINGS CO DISTRIBUTION CENTER

October 3, 2018, 5:38 pm Arrived at USPS Regional Facility COLORADO SPRINGS CO DISTRIBUTION CENTER

USPS Tracking[®]

FAQs > (https://www.usps.com/faqs/uspstracking-faqs.htm)

Track Another Package +

Tracking Number: 70170190000061178398

Remove X

The delivery status of your item has not been updated as of September 29, 2018, 11:38 pm. We apologize that it may arrive later than expected.

	CERTIFIED MAIL® RECEIPT
Alert	For delivery information, visit our website at www.usps.com .
September 29, 2018 at 11:38 pm Awaiting Delivery Scan	Certified Mail Fee \$3,45 0197
Get Updates V	Extra Services & Fees (check box, add fee as appropriate) Return Receipt (hardcopy) \$ \$UUU Return Receipt (electronic) \$ \$000 Certified Mail Retricted Pelvery \$ \$0.000 Here
Text & Email Updates	Adult Signature Required \$ \$0.00 Adult Signature Restricted Delivery \$ \$0.00 Postage \$0.71 Total Postage and Fees \$6.91
Tracking History	Sent To ARNETT, CLINTON D & GREIMAN, Street and Apt. No., SELESTA JANE 2401 MAPLETON CIR City, State, 219-48 LONGMONT, CO 80503
September 29, 2018, 11:38 pm Awaiting Delivery Scan	PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

The delivery status of your item has not been updated as of September 29, 2018, 11:38 pm. We apologize that it may arrive later than expected.

September 29, 2018, 9:38 am Out for Delivery LONGMONT, CO 80503

September 29, 2018, 9:28 am Sorting Complete LONGMONT, CO 80503

September 29, 2018, 5:32 am Arrived at Unit LONGMONT, CO 80501

September 28, 2018, 3:33 pm Departed USPS Regional Facility DENVER CO DISTRIBUTION CENTER