# MEMORANDUM

By: Philip Nicholas, counsel for Mountain Cement Company

Re: Department of Environmental Quality, Land Quality Division
MCC Permit 296C-A7, TFN 5/110

Meeting: Points coming out of meeting dated January 2, 2014, with the following participants:

MCC: Andy MacClugage, Jeff Brasher, Phil Nicholas & Mitch Edwards

DEQ-LQD: Lowell Spackman & Andrew Kuhlmann (by phone)

Brian Waitkus



Date: January 6, 2014

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Following the meeting described above, as well as communications between Phil Nicholas and Brian Waitkus today, Mountain Cement Company agrees to make the following changes to its Permit Application:

1. RECLAMATION PLAN IX:

   Issue: Revised page RPIX-19 inadvertently replaced the wrong page.

   Solution: It was discovered that recent revisions were made to an earlier draft of the permit. Attached as Exhibit A is the revised pages to RPIX 19-26. This restores the original RPIX Page 19, and incorporates the last changes to the permit.

2. APPENDIX DIX5: TOPAGRAPY, GEOLOGY & OVERBURDEN ASSESSMENT

   Issue: Pages DIX5-8 & 9 do not appear to be congruent, there appears to be an omission. It appears that there is an omission in the revised text.

   Solution: Attached as Exhibit B is revised pages DIX 8 & 9 which corrects this issue.

3. APPENDIX DIX6 HYDROLOGY:

Issue: Does the Mine Permit Application properly identify wells being monitored by MCC? Specific concern addresses the home of Sandy Brome, which is not currently being monitored by MCC

Solution: The well on MPIX-B1 does incorrectly label the P94924W Well as the Brome Well. Attached as Exhibit C is a corrected page correctly identifying the well as the Johnson No. 2 Well.

4. APPENDIX DIX9 WILDLIFE

Issue: The last page of the section, Page DIX9-63 provides a quad map with apparent nesting sites. There are site with red and blue dots. The map does not have a key. Presumably, the blue dots were sites that were not located and the red dots are confirmed nests.

Solution: Attached as Exhibit D is a modified map with a key.

5. MINE PLAN IX

Issue: Page MPIX-3, MPIX-2 Type of Mine second to last sentence includes the words “southern extents of the permit area and move west…” Should the “west” be changed to “east.”

Solution: MCC agrees that “east” better describes its mine plan. Attached as Exhibit E is an amended page with more appropriate language describing the MCC’s overall mine plan.

6. RECLAMATION PLAN IX

Issue: Page RPIX-4, last sentence specifies LQD Noncoal R&R Chap. 3, Sect. 2 (b)(ii)(A)). Isa that the correct section, should it be (b)(ii)(A)?

Solution: MCC agrees to eliminate the citation. Attached as Exhibit F is the amended page.

Exhibit A

Appropriate methods will be used to protect seeded areas. The revegetated areas will be protected from domestic grazing either through the erection of temporary fencing or arrangements will be made in advance with ranchers to graze their livestock elsewhere until bond release is reached. Fencing will also help minimize the amount of grazing pressure from wildlife. County Declared Weeds and Designated Noxious Weeds are to be controlled for a minimum of five years on permanently reclaimed lands in preparation for bond release. See the Integrated Weed Management Plan in Addendum RPIX-A

Tree replacement methods. MCC will likely allow one or more years after planting of the prescribed seed mix for an area before beginning tree replacement, allowing the seed mix to begin establishment before receiving traffic necessary to replace trees.

Tree replacement is likely to be most successful if replacement trees are positioned near the sites of the pre-mine trees they replace. Predictions of tree parameters for numbered pits and parts of them are provided in Vegetation Appendix Table DIX8-22. More importantly, the section below on revegetation success performance standards describes how trees to be affected in each stripping campaign are to be inventoried and tracked to guide later replacement.

At present, transplant of small trees in the form of plug seedlings is the most successful and cost-effective method for growing our species of trees in mine reclamation. The most likely source of transplant material is the University of Idaho Center for Forest Nursery and Seedling Research, http://seedlings.uidaho.com. An alternate source of plug seedlings the local office of the USDA Natural Resource Conservation Service or Conservation District. In 2012 prices range from $0.38 each (for Douglas fir and lodgepole pine as 5 cubic inch root plugs in quantities of 100 or more) to $2.25 each (for our other species as 20 cubic inch root plugs in quantities less than 200). Timing of planting is critical to tree survival. Nursery stock should be ordered and delivered well ahead of time and kept cold in coolers until weather and soil conditions are right for transplanting. There should be no snow on the ground but one or more heavy snowstorms yet to come before summer. These conditions are most likely in parts of February and March in our permit area. Probably a hoedad, tree shovel, or other specialized tree-planting tool will be used to help get the plugs properly planted without undue drying out.

MCC will likely use some combination of methods to protect transplanted trees and reduce their mortality rates. Available methods include: 1) careful handling of nursery stock in terms of mechanical damage, temperature, humidity, and wait time before transplant, 2) planting on the north or east sides of stumps, logs, large rocks, or man-made shelters (such as windwalls, http://www.lrcd.net/) , 3) removing vegetation and leaf litter in a 30" x 30" square at the transplant site before planting, 4) placing tree fertilizer in the hole but a few inches deeper than or to one side of the root plug, 5) watering any dry plugs before planting, 7) one or more waterings during the first growing season, 8) controlling weeds for 3 or more years, 8) discouraging herbivores with spray-on repellants, mesh-type tubing, and/or solid tubes 8-12" tall (one option is called Rigid Seedling Protector Tubes http://www.forestry-suppliers.com/product_pages/View_Catalog_Page.asp?mi=16201&title=Rigid+Seedling+Protector+Tubes), and 9) placing a wooden stake next to a transplant to protect it from feet and vehicles. A good reference to guide MCC in its tree planting efforts is the University of Idaho's publication (Dumroese, 2012-09-17 visit) "How to Plant Seedling Trees for Idaho's Farms and Forests" available at http://seedlings.uidaho.com/Content/Assets/Plant%20Your%20Seedlings%20Right%202a.pdf.

Some transplanted trees will die, so MCC likely will want to plant a selected number of trees initially, then plant again after a year or more has passed to replace trees that have died, bringing the numbers up to meet bond release criteria.

Other types, sources, and timings of transplants may be attempted if desired by MCC. Seeding rather than transplanting may be attempted if MCC chooses, especially if successful new methods of seeding these species arise.

Tree Replacement Success Standards. The tree species to be removed and replaced for this permit fall into two importance categories per LQD policy.

1) Most important: limber pine (*Pinus flexilis*). The bond release criterion will be replacement at a ratio of 1:2 for replaced trees to pre-mine trees, except for in any MM revegetation which will have a different criterion to be negotiated with LQD.
2) Less important tree species including: Douglas fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), subalpine fir (*Abies bifolia*), Engelmann spruce (*Picea engelmannii*), Rocky Mountain juniper (*Juniperus scopulorum*), black chokecherry (*Prunus virginiana*), quaking aspen (*Populus

*tremuloides*), and narrowleaf cottonwood (*Populus angustifolia*). The bond release criterion will be replacement of ¼ of the pre-mine numbers of trees for each species, except for in any MM revegetation which will have a different criterion. In this less important category of trees, MCC has the option to replace up to ½ of the prescribed conifers (Douglas fir, ponderosa pine, lodgepole pine, subalpine fir, and/or Engelmann spruce) at higher-elevation locations with aspen.

Trees should have survived at least two summers and two winters after planting at the time of bond release study and the accompanying LQD bond release inspection. Size of such surviving trees is not a consideration for bond release.

If trees were documented present before mining in an area to be studied for bond release, a component of the bond release study should be field data giving evidence that the tree standards have been met for the specified logical bond release unit. This could take the form of a direct count of trees by species with boots on the ground or by photographic methods, a plotless distance method with 15-20 randomly chosen sample points, a series of randomly positioned and oriented belt transects (may be based on cover transects for the same vegetation study), or another sampling method approved in advance by DEQ-LQD. Tree density data are not subject to sample adequacy tests.

<u>Mountain Mahogany Revegetation Success Standards</u>. If mountain mahogany revegetation is attempted by MCC these areas likely will require special standards for judging revegetation success. Vegetation cover at least equal to a pre-mine Comparison Area (CONA, REFA, etc.) likely will be an inappropriate standard for MM revegetation because MM inherently grows slowly (Brotherson et al., 1980). It is a specialist plant that grows in specialized habitats (Brooks, 1962). Slow growth would also partially be due to the relatively harsh soil conditions necessary for MM to be able to out-compete generalist plants, such as in the faster-growing grass-dominated seed mixtures, which are comprised of generalist plants planted into the most favorable soil conditions attainable after mining.

As MM growth progresses, a fair set of revegetation bond-release criteria should be cooperatively developed to accomplish the purposes of both MCC and DEQ. If two years of time after planting indicate that revegetation success by regular study methods in Guideline 2 is unlikely within the ordinary five years, studies or other preparations for bond release through a special arrangement should begin, in order to make bond release achievable within ordinary revegetation timeframes such as nine years.

Similarly, tree replacement standards for any MM revegetation should be negotiated between MCC and LQD as a MM revegetation project develops over time. Tree replacement standards for any MM revegetation areas should be lower than such standards for other revegetation types because tree replacement is likely to have special difficulties and extra costs. Below are some likely difficulties. Seeding MM, waiting 1 or 2 years, then transplanting trees as with other revegetation types may cause unacceptable amounts of damage to young MM plants. Seeding MM, waiting enough years for MM plants to have well-developed root systems that are likely to resprout after stems are smashed, then transplanting trees may present an unacceptable delay of bond release and still cause unacceptable damage to MM plants. Planting tree seeds along with MM seeds may not produce trees. Transplanting trees into a site before seeding MM would have the drawback that if MM revegetation failed and the site was spread with additional soil and planted with a multi-species seed mix, the transplanted trees would have to be sacrificed or avoided by equipment.

General Vegetation Performance Bond Release Standards. For revegetation with the above MS-MSH and MXC seed mixes, revegetation shall be deemed to be complete and eligible for full bond release when:

(1) the non-tree vegetation species of the reclaimed land are self-renewing under natural conditions prevailing at the site;

(2) the total vascular vegetation cover of desirable perennial species (excluding alien Designated Noxious and County Declared Weed species) is at least statistically equal to the total vascular vegetation cover of desirable perennial species on the area before mining;

(3) the species diversity and composition are suitable for the approved post-mining land use;

(4) tree replacement performance standards above are achieved; and

(5) the requirements in (1), (2), (3) and (4) are achieved during one growing season, no earlier than the fifth full growing season on the reclaimed lands.

To document achievement of the above criteria, a vegetation study should be conducted following standard methods pre-approved by LQD. A Reference Area (REFA) for a given study should be agreed upon between MCC and LQD at least three months before sampling begins following the reasoning discussed in the Vegetation Appendix Section 8.4.5.

**RPIX-6.0 Final Hydrologic Restoration**

The drainage system after reclamation will be just as it was before mining occurred. MCC, though mining near drainages, will not be mining through or below the level of adjacent drainages. There will be no need for reconstructing major drainage channels. However, there are places in affected areas where the reclamation will be contoured to reflect the microtopography and undulations of the pre-mining landscape and drainage systems. The reclamation will be constructed with a higher drainage density than that of the pre-mine topography. Increasing the drainage density will keep runoff volumes and velocities manageable and less erosive. Please see Maps RPIX-2 and RPIX-4. No impoundments or sediment ponds are planned at this time. The final water quantity and quality will be unchanged from the pre-mining quality and quantity. Please see Appendix MPIX-1 for quarterly groundwater quality results by year and well for the Etchepare Quarry.

The drainage systems for the reclaimed areas will be constructed as to mimic the native pre-mine drainage system. The affected areas will have the minor drainages and subdrainages reconstructed through backfilling and contouring allow them to drain as they did prior to mining. They will have undulations and interfluves constructed in them to increase drainage density. The reclaimed areas will drain to the main drainages through native channels. No wetlands will be affected by the operation; any possible wetlands occur in the drainage bottoms and the mining operations will take place on the ridge tops.

MCC doesn't anticipate the operation having any affect on the hydrology of the surrounding area. Mining will not be taking place in the aquifer (lower water-saturated levels of the Casper Formation) and will be at least 50 feet above the potentiometric surface in all pits. Furthermore, the mining will remain well above the elevation of the adjacent drainage bottoms.

MCC will not attempt to mine two limestone layers in places where they are not absolutely sure that they will remain above the elevation of adjacent drainages or remain at least 50' above the potentiometric surface. As discussed in the Mine Plan, MPIX, the greatest precautions will be taken to avoid spilling or releasing any amount of contaminants.

### RPIX-7.0 Special Reclamation Standards

There will be no permanent facilities or utilities that require special reclamation. All storage facilities will be mobile or constructed with such method that will allow for disassembly and remobilization. It is anticipated that utilities such as power lines will not be necessary at this point; should they become necessary, they will be constructed in such a way to avoid undue degradation and removed according to DEQ/LQD Guideline No. 12. There will be no rail road spurs or shops with in the permit area.

Howe Lane, Mountain Air Road, and the North Piper Haul Roads will be left in their current condition when mining is complete. This will be done pursuant to Mountain Cement's easements and right of ways discussed in the roads discussion in the Mine Plan. Mountain Air Road and Howe Lane are residential roads as well as haul roads; after the completion of mining the will revert to residential roads. The North Piper Haul Road is owned by Rich & Cindy Avery; after the completion of mining the road will be left for their use as a ranch road. Attached as Appendix MPIX-D is the Final Judgement and Warranty Deed for Howe Lane Haul Road as previous acceptance by the landowners that the road would be left as-is; and the necessary Consent from the Avery's.

Other than the roads described above, all haul roads will be reclaimed after mining and hauling is complete; this includes roads that will be constructed in State of Wyoming Section 36 and all haul roads within the 298c permit area. The road base will be ripped with the ripper teeth on the grader and be hauled off and used as fill or to upgrade roads elsewhere. The reclaimed road surface will be topsoiled and seeded with the appropriate seed mix. In instances where haul roads have been upgraded or built on pre-existing two-track roads, these roads will be reduced and restored to pre-existing two-track condition. Roads will only be left in place after consultation with, and receiving written permission from, the landowner.

If after the completion of mining Mountain Cement decides to reclaim the portion of Howe Lane Haul Road on its surface it will be done as described above.

**RPIX-8.0 Reclamation Schedule**

In most cases each pit will be backfilled when stripping the proceeding pit. For instance, pit 1 will be backfilled and contoured with the overburden and, if occurring, interburden from pit 2. This work will take place in the spring and summer so that the fill will be ready for topsoil in the summer and ready fro seeding in the fall. In this case, the topsoil will be hauled from pit 1's stockpile or directly hauled from pit 2. Every attempt will be made to have seeding done in the fall. The following spring pit 2 would have its reclamation started while opening pit 3. The current Etchepare 6 & 7 pits will be reclaimed and seeded prior opening the proposed pit 1.

**RPIX-9.0 Reclamation Costs**

As of July 2012 the bond for the Etchepare Limestone Quarry is approximately $640,000. The bonding amount is revised yearly in the quarry's annual report. The current amount covers the cost of reclamation through March 2013. Prior to commencing the A8 mine sequence Mountain Cement will revise the bond estimate to reflect the disturbance of the first A8 mine sequence block. The bond will continue to be updated by Mountain Cement and reviewed by WDEQ/LQD annually.

## RPIX-10.0 References

Bird, N. 2009. Development and identification of the Rhizobiaceae nitrogen-fixing symbiosis with Fabaceae as a nitrogen source in reclamation of disturbed lands in Wyoming. Soil Science and Environmental Natural Resources. MS. Thesis, University of Wyoming, Laramie.

Brooks, A. C. 1962. An ecological study of *Cercocarpus montanus* and adjacent communities in part of the Laramie Basin. M.S. Thesis, University of Wyoming, Laramie.

Brotherson, J. D., J. N. Davis & L. Greenwood. 1980. Diameter-age relationships of two species of mountain mahogany. J. Range Manage. 33:367-370.

Dumroese, R. K., D. L. Wenny & Y. C. Barkley. Visited 2012-09-17. How to Plant Seedling Trees for Idaho's Farms and Forests, 3rd Revision. University of Idaho Publication CIS 528. Moscow, ID. Available at http://seedlings.uidaho.com/Content/Assets/Plant%20Your%20Seedlings%20Right%202a.pdf.

Pavek, D. S. 1992, visited 2013-01-06. *Chamerion angustifolium*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available at http://www.fs.fed.us/database/feis/.

__insert **Addendum A   Integrated Weed Management Plan** here
from file RPIX A Weed Mgmt Plan.docx

# Amendment 298C-A8

# Reclamation Plan

# Etchepare Limestone Quarry

## Maps

**RPIX-1**

**RPIX-2**

**RPIX-3**

**RPIX-4**

to the point the material is not suitable for cement production. The limestone grades to a mixture of sandstone and limestone at variable depths and is finally underlain by sandstone. Drilling has been conducted in several areas throughout the current permit. In 2008 and 2010 Mountain Cement drilled its own property, as well as Mountain Land & Cattle Company's property, to estimate and evaluate the depths of overburden and the uppermost limestone layer, as well as to estimate the thicknesses of the sandstone interburden and second limestone. Similarly, they also collected quality data for the top and second limestones. The interburden ranged between 15 and 40 feet in thickness. The drilling logs from the 2010 drilling campaign are attached as Figure DIX5-55.

DIX5.4 Overburden and Interburden

The amount of overburden encountered over limestone ranged from zero to 25 feet but is closer to zero on most areas to be mined. This material is generally soil and sandstone with a limited amount of limestone, which is unsuitable for use in the plant. However, the amount of overburden varies due to the vastness of the permit area. Past reclamation and revegetation success at various sites within the permit area using the overburden as backfill have demonstrated its suitability. Five overburden sampling locations were randomly selected across the amendment area: the samples have been analyzed for pH, conductivity, and Extractable Selenium. The interburden is primarily the sandstone members of the Casper Formation with red and black shales and siltstones occurring locally. The interburden will be used as fill when mining is complete.

**Overburden Analysis Table**

| **Overburden Sample #** | **pH** | **Conductivity**(mmhos/cm) | **Extractable Selenium** (ppm) |
|---|---|---|---|
| **1** | 8.3 | 0.4 | <0.001 |
| **2** | 7.8 | 0.5 | 0.380 |
| **3** | 7.6 | 0.8 | <0.001 |
| **4** | 8.0 | 0.4 | 0.500 |
| **5** | 8.5 | 0.6 | <0.001 |

DIX5.5 Conclusions

The areas to be mined are found on gently sloping upland limestone outcrops of the Casper Formation, overlain with sandstone and detritus as overburden. The interburden consists of sandstones, shales and siltstones of the same formation. The specific sites to be mined are shown on Maps DIX5-1, DIX5-2, and Maps MPIX-1 and MPIX-2 of the mine plan. This limestone will be mixed with the appropriate amounts of other raw materials in a process primarily for producing dry cement.

## DIX5.6 SOURCES

Benniran, M.M., 197O, Casper Formation limestone, southwestern Laramie Mountains, Albany County, Wyoming: M.S. Thesis, University of Wyoming, Laramie, 95 p., plate 1, map scale 1:24,000

Burritt, Edward Curtis, 1962, A ground water study of part of the southern Laramie Basin, Albany County, Wyoming; University of Wyoming Department of Geology and Geophysics, M.A. Thesis.

Casper Aquifer Protection Plan, 2011

Lowry, Marlin E., Rucker, Samuel J., IV, and Wahl, Kenneth L., 1973, Water resources of the Laramie, Shirley, Hanna Basins and adjacent areas, southeastern Wyoming; U.S. Geological Survey Hydrologic Investigations Atlas HA-471.

Lundy, D.A., 1978. Hydrology and Geochemistry of the Casper Aquifer in the Vicinity of Laramie, Albany County, Wyoming. Unpublished M.S. Thesis, University of Wyoming.

Ver Ploeg, Alan J., 1995, Preliminary Geologic maps of the Laramie and Red Buttes Quadrangles, Albany County, Wyoming. Wyoming State Geological Survey.

Ver Ploeg, Alan J., 2008, Geologic Map of the Laramie Quadrangle, Albany County, Wyo. Wyoming State Geological Survey.

Ver Ploeg, Alan J., 2007, Geologic Map of the Red Buttes Quadrangle, Albany County, Wyo. Wyoming State Geological Survey.

Ver Ploeg, Alan J., 2006, Preliminary Geologic Map of the Pilot Hill, Albany County, Wyo. Wyoming State Geological Survey.

Ver Ploeg, Alan J. and Boyd, Cynthia S., 2000, Preliminary Digital Geologic Map of the Laramie 30’x 60’ Quadrangle, Albany and Laramie Counties, Southeastern Wyoming. Wyoming State Geological Survey.

DIX5.7 FIGURES

**Geologic Cross-Sections**
Figures DIX5-1 Through DIX5-54

**Drill Hole Stratigraphic Columns from 2010 Exploration Work**
Figure DIX5-55

<u>Figure DIX5-55</u>

**Drill Hole Stratigraphic Columns from 2010 Exploration Work**

**Introduction:**

The attached Stratigraphic Columns were generated from the Drill Hole Log data collected as the holes were drilled. The drilling operations took place in November 2010 and June 2011; at no point during the drilling was groundwater intersected.

Exhibit C

# APPENDIX MPIX-B

## Quarterly Groundwater Monitoring Results by Year and Well

**Table I-**Results for the "Johnson No. 2" well, SEO Permit #P95938W

| **Parameter (2004)** | **1/14/04** | **3/10/04** | **6/30/04** | **8/24/04** |
|---|---|---|---|---|
| Depth to Water, Feet | 205 | 196.0 | 176.0 | 191.0 |
| Lab Conductivity @ 25 ºC, µmhos/cm | 357 | 354 | 366 | 392 |
| Total Dissolved Solids @ 180 ºC, (mg/L) | 210 | 220 | 270 | 220 |
| Total Alkalinity as $CaCO_3$, (mg/L) | 208 | 207 | 207 | 207 |
| Total Hardness (mg/L) as $CaCO_3$, mg/L | 209 | 206 | 216 | 198 |
| Nitrate - Nitrite as N (mg/L) | 1.38 | 1.31 | 1.34 | 1.39 |
| Total Petroleum Hydrocarbons, TPH 418.1, (mg/L) | <1; i.e., ND | <1; i.e., ND | <1; i.e., ND | <1; i.e., ND |
| **Parameter (2005)** | **2/22/05** | **6/21/05** | **8/30/05** | **12/15/05** |
| Depth to Water, Feet | 198.1 | 198.4 | 197.58 | 196.65 |
| Lab Conductivity @ 25 ºC, µmhos/cm | 376 | 349 | 364 | 395 |
| Total Dissolved Solids @ 180 ºC, (mg/L) | 200 | 220 | 210 | 220 |
| Total Alkalinity as $CaCO_3$, (mg/L) | 206 | 208 | 204 | 206 |
| Total Hardness (mg/L) as $CaCO_3$, mg/L | 212 | 205 | 219 | 211 |
| Nitrate - Nitrite as N (mg/L) | 1.28 | 1.23 | 1.31 | 1.31 |
| Total Petroleum Hydrocarbons, TPH 418.1, (mg/L) | <1; i.e., ND | <1; i.e., ND | <1; i.e., ND | <1; i.e., ND |
| **Parameter (2006)** | **5/25/06** | **7/31/06** | **9/27/06** | **12/7/06** |
| Depth to Water, Feet | 197.92 | 198.87 | 198.93 | 198.96 |
| Lab Conductivity @ 25 ºC, µmhos/cm | 390 | 392 | 386 | 375 |
| Total Dissolved Solids @ 180 ºC, (mg/L) | 210 | 210 | 200 | 190 |
| Total Alkalinity as $CaCO_3$, (mg/L) | 190 | 213 | 199 | 196 |
| Total Hardness (mg/L) as $CaCO_3$, mg/L | 210 | 212 | 207 | 209 |
| Nitrate - Nitrite as N (mg/L) | 1.5 | 1.39 | 1.25 | 1.14 |
| Total Petroleum Hydrocarbons, TPH 418.1, (mg/L) | <5; i.e., ND | <1; i.e., ND | <1; i.e., ND | <1; i.e., ND |
| **Parameter (2007)** | **3/20/07** | **6/25/07** | **9/6/07** | **11/29/07** |
| Depth to Water, Feet | 197.92? | 198.87? | 198.93? | 198.96? |
| Lab Conductivity @ 25 ºC, µmhos/cm | 393 | 392 | 392 | 397 |
| Total Dissolved Solids @ 180 ºC, (mg/L) | 220 | 250 | 220 | 220 |
| Total Alkalinity as $CaCO_3$, (mg/L) | 203 | 210 | 206 | 204 |
| Total Hardness (mg/L) as $CaCO_3$, mg/L | 200 | 200 | 200 | 209 |
| Nitrate - Nitrite as N (mg/L) | 1.20 | 0.58 | 1.27 | 1.10 |
| Total Petroleum Hydrocarbons, TPH 418.1, (mg/L) | <1; i.e., ND | <1; i.e., ND | <1; i.e., ND | <1; i.e., ND |

## APPENDIX E

## Raptor Nest Map

Figure E-1. Raptor nests observed and previously reported on the site and in the vicinity. Those nest sites in blue are no longer present while those in red were present as of 2009.

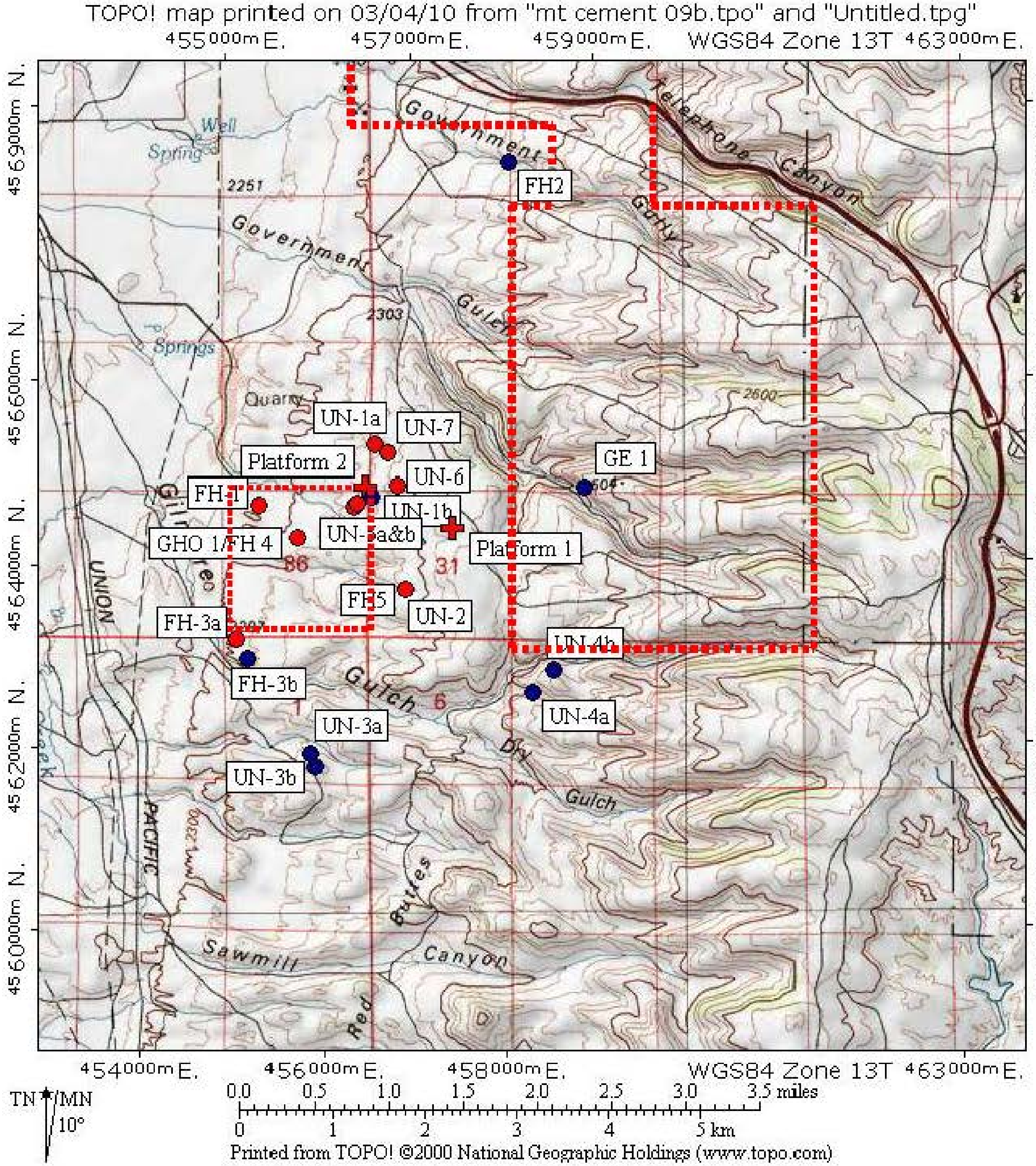

Exhibit E

## MPIX-1.0 **Site Location**

This mine plan covers Mountain Cement Company's *(a.k.a. MCC)* Etchepare Limestone Quarry, located approximately 7 miles southeast of Laramie, Wyoming in southern Albany County. More specifically it is located in Sections 7,17, 18, 19, 20, 21, 28, 29, 30, 31, 32, 33 T15N, R72W, Sections 13, 24, 24, 26, 36 T15N, R73W, 6th P.M. and occupies approximately 8434 acres (Map MPIX-1). The site varies in elevation from 7400’ to 8700’. Mining activity will take place on approximately half of the permit area. Access to the mining areas will be provided by a network of haulroads; the particular road being used at anytime will be a result of the area being mined. The yearly and current projected mining activities will be updated and shown in the Annual Report (Permit No. 298C), and submitted to the LQD.

## MPIX-2.0 **General Description**

### MPIX-2.1 Type of Mine

The rock mined in this quarry is limestone. Limestone is a major raw mix component for the manufacture of Portland cement. At current cement production rates, approximately 840,000 tons of limestone will be removed each year from all of MCC’s various limestone quarry sites. The limestone deposits in this quarry vary in quantity and quality; therefore, it is essential that MCC be able to quarry multiple pits at any given time for blending purposes. Also, due to the harshness and unpredictability of weather in the Laramie Basin, MCC must be able to access multiple pits in case of adverse weather conditions Upon approval of this application, mining throughout the permit area will generally begin in the most southwestern region of the permit area and thereafter move toward the east, mining will later move to the north and progress southward as MCC mines eastward up the ridge crests as shown on the Map MPIX-1. This plan mines the exterior areas closest to residential encroachments first, later moving inward.

### MPIX-2.2 Life of Mine

MCC estimates the reserve life of the Etchepare Limestone Quarry to be at least 125 years and could be at most 200 years. This reserve life estimate is based on an approximate annual limestone demand of 500,000 tons until 2027, when the Weaver Quarry becomes depleted; then an estimated 1.1 MTons (million tons) will be mined each year. The reserves are

Exhibit E

1) Use available sandstone/overburden/interburden fill material from a nearby stockpile or stripping project.

2) Drill and blast the highwall(s) to do one or both of the following:

A. reduce the highwall and/or produce fill material. This can include harvesting all permitted limestone from the lateral edges of mining areas.

B. create through drainage by opening a broad channel potentially half as deep as the low point of the pit floor through to the adjacent native drainage. This may be done before or after revegetation establishment. This channel may be i) left as an erosion-resistant bare rock channel, ii) topsoiled and revegetated, or iii) left as bare rock but with one or more low temporary or permanent check dams that will catch sediment and grow volunteer vegetation.

(Drawbacks to these reclamation blasting options include 1) the cost and environmental impacts of blasting, and 2) the need to either haul less of the pit's limestone to the cement plant or get a Non-Significant Revision (NSR) approved to disturb area slightly outside the disturbance limit.)

3) Haul overburden a greater distance from a non-adjacent place within the permit area. (The drawbacks of this include increased environmental impact by heavy equipment and increased cost of hauling.)

4) Leave one or more lengths of highwall unreduced or partially reduced according to plans given below. (The drawbacks of unreduced highwalls include the liability of leaving a fall hazard to people and wildlife, and the need to make arrangements with interested parties such as LQD; but see also the benefits described below.)

5) Mine less limestone than permitted but strip as much as the entire permitted disturbance area to generate additional fill material. (The drawbacks of this approach include high cost per ton of extracted limestone, increased environmental impact by heavy equipment, and possibly "unwarranted increase in the amount of affected lands."