



Big Stone Quarry Executive Summary

Prepared December 2011

- **Project Owner:** Strata Corporation is a diverse heavy construction and ready mix concrete company with substantial aggregate and transportation operations. The company has over 40 business locations throughout the region, extending from eastern Montana to central Minnesota. The company is headquartered in Grand Forks, ND and in 2010, celebrated its 100th year in business.
- **The Big Stone Quarry Project:** This project consists of a ±102 acre quarry development on a 478 acre rural site located approximately 2 miles southeast of Ortonville, MN within Big Stone County. Design and development of this project began in 2006. We hope to be completed with the extensive permitting process for this project in mid 2012, and to then begin pre-operational construction activities. Actual mining and processing operations would likely begin in 2013 or 2014.
 - The project is located in the western ½ of Section 22, with a portion of the Access Road extending into the S½ of the SE¼ of Section 22, all within T-121N, R-46W of Big Stone County, MN.
 - The quarry development is on private pasture land which has been acquired by long term lease from Gayle & Colleen Hedge, local residents and business owners.
 - The property is currently utilized as a livestock feedlot and pastureland grazing operation.
 - The footprint of the project development is ±102 acres and includes:
 - A three phase Mining and Aggregate Processing area (Quarry Areas #1, 2 & 3) - 95.55 acres
 - 2 Drainage Crossings (soil berms w/culverts crossing over a drainage) – 0.015 acres
 - Overland Conveyor Line & adjoining Service Road (±1578 ft long) - 0.72 acres
 - 1.09 mile long graveled Access Road (connecting to County Rd 17) - 3.69 acre
 - Construction of a Shop and Office Building - ± 2 acres
 - The project will also result in the construction of nearly 9,200 feet of new Railroad Tracks, an (optional) Railcar Loadout Building and an adjoining service road, all along the south side of the existing BNSF Railway Main Line Tracks on railroad property.
 - Additionally, the project proposes to create a ±59 acre Rare Plant Protection Area in which several species of rare and/or endangered plants along with rare wetland features and pristine granite rock outcrops will be permanently protected by way of gifting this parcel to the adjacent Big Stone National Wildlife Refuge.
 - The project area is surrounded on the west side by the Minnesota River (Whetstone Diversion Channel), on the south side by the Big Stone National Wildlife Refuge, on the east side by the Cold Spring Granite quarry and pastureland, and on the north side by the BNSF Railroad and US Hwy 75.
 - In 2009, a Bike Path / Pedestrian Trail was constructed on this property adjacent to the Whetstone Diversion Channel, with the cooperation of the Landowner and Strata Corporation.
- **Aggregate resource:** Aggregates (processed stone, sand & gravel) are the primary ingredient in common building materials such as concrete, asphalt pavement, base & surfacing materials for roads, etc. There exists a severe shortage of high quality aggregates within the region (especially within the metropolitan centers) which are needed to maintain and fuel the growth of basic infrastructure needs (highways, streets, bridges, building foundations, basements, driveways, sidewalks, etc). Aggregate is vital to the state's infrastructure.
 - This site represents a unique and very substantial deposit of high quality granite bedrock which may become a key resource to serve the aggregate needs of the greater region, the State of Minnesota and its metropolitan centers.
 - Although few people realize it, every person living in Minnesota consumes the equivalent of about 21,000 pounds of aggregates per person per year just to supply the amount of aggregate materials needed annually to maintain and construct roads, develop infrastructure, support building and construction projects, and for use in industrial applications! A new home requires about 120 tons of aggregates to construct. One mile of 4 lane highway uses over 20,000 tons of aggregates.
 - Many DOT infrastructure projects (ie: Bridges) require the use of crushed granite bedrock in their concrete mix designs for superior strength and durability.
 - Aggregate mining contributes significantly to the state economy and employs over 10,000 people in the state of Minnesota.



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- This site contains enough high quality bedrock to service the concrete and road aggregate needs of the greater region for generations to come.
- **Impacts to the Community:** The mine plan maintains a safe distance from the residential homes located along the northern side of US Hwy 75.
 - Distance to Hwy 75 Residences varies from over ½ to 1 mile (ie: about 9-16 city blocks) from the initial location of the quarry. If over many decades, the quarry grew to its maximum potential size, the distances from the nearest edges of the quarry would still be about ¼ mile away (ie: about 4 city blocks) to the nearest Hwy 75 Residence.
 - As this is a long term, virtually permanent development, the economic benefits to the community will be long lived.
 - Internal projections suggest an initial employment of six to eight full time personnel, growing over time.
 - No detailed property tax impact analysis has been completed to date. The Big Stone County Aggregate Removal Tax imposed is expected to initially generate over \$20,000 in tax revenues growing larger over future years.
- **Discovery of rare plant species:** Solely due to this development project, extensive botanical and wetland surveys have been conducted upon the subject property, and all findings have been published and provided to the Minnesota DNR without cost. Strata Corporation has worked closely with the DNR to develop an extensive and detailed plan to minimize impacts to these rare plant species and their habitats, while permanently protecting the great majority of them. The results of these surveys have resulted in a new wealth of scientific knowledge of rare plant species unlike any other in the state, including detailed and specific inventories of rare plant species, locations, quantities and habitat.
 - The result of these botanical surveys will greatly increase the understanding of the rare elements that occur within the property, and have contributed to major revisions in the proposed mine plan to permanently protect those elements.
 - This mine plan establishes permanent ±59 acre Rare Plant Protection Area encompassing the highest concentration of rare plant colonies and habitats as well as unique wetland features and some of Minnesota's most pristine and majestic Granite Rock Outcrops.
 - As a result of this project, the property owners (Gayle & Colleen Hedge) propose to gift this 59 acre Rare Plant Protection Area over to the adjacent Big Stone National Wildlife Refuge to insure the long term survival and promote the future growth of these rare plant species and their habitat.
 - This Rare Plant Protection Area can serve to educate and promote a greater scientific knowledge and understanding of Minnesota's rare plants and their unique habitats.
- **Impacts to wetlands:** This site contains a series of natural wetlands that drain seasonal runoff from areas north of the site.
 - All wetlands within the project area have been delineated (surveyed and GPS mapped) and the mining plan has been designed to minimize and/or avoid impact to them. In areas where some minor wetland impacts (3.26 acres) were unavoidable, a wetland replacement plan is being submitted for state and federal consideration.
 - Wetland surveys on the property have identified ephemeral wetland pools (small shallow bowl-like depressions in the bedrock that collect seasonal rain water) associated with the granite outcrops. Many of these ephemeral pools consist of wetland/non-wetland mosaics providing a unique habitat that can support a diversity of tiny plant and insect species. The mine plan has been revised to avoid impact to all the ephemeral wetland pools, and to permanently protect virtually all of them via the Rare Plant Protection Area.
 - The mine plan allows all naturally occurring drainage patterns on the site to remain intact and to continue to provide drainage for seasonal runoff events.



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- Surveys of the watersheds surrounding the project area have been completed, and were used in the design of the project to insure no damaging impacts to these watersheds. Their drainage flows will remain intact.
- **Preserves majestic granite outcrops:** This mining plan preserves the largest and most pristine granite outcrops located on this site.
 - There are large granite rock outcrops on the southern end of this site towering 40 feet above the surface that represent some of the most unique and majestic geological features in the State of Minnesota and the multi-state region. These unique granite rock outcrops will be permanently protected with this mine plan.
 - These granite outcrops were discovered to contain an extensive community of rare plant species whose habitats are exclusive to this type of geological feature.
 - Outside of this privately owned site, similar granite rock outcrops can be found in the adjacent Big Stone National Wildlife Refuge and near the communities Granite Falls and Morton, MN.
- **Impact to current site uses:** Due to increased urban growth and grasslands being converted into farmland, this region is experiencing a slow but steady reduction in the amount of grasslands available for livestock grazing. One can reasonably assume that area livestock operations will continue to pressure available grasslands in the region, including those found on this site.
 - As demonstrated by the current livestock operations on this site, livestock traffic and grazing does have a devastating impact upon the rare botanical species found on this site.
 - The existing livestock activities have literally destroyed all rare botanical species within the northern half of this site, and left unchecked, will eventually have a similar impact upon the rare botanical species remaining in the southern half of this site (as increased grazing activities pressure the utilization of the entire site).
 - This mine plan permits the existing cattle feedlot operations to remain where they are currently located for several decades (30-50 years) to come.
 - This mine plan will have an immediate elimination of livestock grazing activities within the southern portion of the site (in and around the Rare Plant Protection Area), where the great majority of the rare species remain and offering them permanent protection.
- **Hours of Operation:** At this time, we do not foresee the business demand to merit consideration of nighttime work schedules at the Big Stone Quarry operation. Our production and operational demands are normally fulfilled on typical daylight (7am – 6:30pm) work schedule (M-F plus reduced Saturday hours) during the construction season (mid March thru mid November). As our work is virtually all outdoors and involves the washing of rock products with water, inclement and frigid winter weather usually forces the shutdown of outdoor production operations. In contrast, the warm summer months generally produce an uptick in construction activities resulting in longer daytime production shifts.
 - Nighttime or Sunday shift schedules will be considered only during periods of extreme business demand.
- **“Drill & Shoot” Blasting:** As is the case with all rock quarries, the bedrock needs to be dislodged with explosive charges to displace and reduce the rock size to permit modern crushing equipment to process it.
 - Modern drill & shoot techniques are a precise and highly engineered activity. Today’s customized techniques are able to accurately predict the resulting debris, noise and vibration hazards in advance to mitigate any potential damages.
 - All blasting activities conducted at this site will be in strict accordance with US Bureau of Mines (and several other federal agency) regulations designed to insure safe and non-hazardous operations.
 - The mine plan will utilize certified explosive experts to determine the location, depths and pattern of explosive charges in an effort to avoid damage to nearby wetlands, rare species or other important features.



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- Seismic monitoring will occur at this site for every blast event, measured from the nearest protected structure to monitor and record seismic vibration and air over-pressure.
- A typical “Blast Day” involves one or more (typically two) separate blast sequences in a given day (spaced a few minutes to a few hours apart), with each blast sequence having a total time duration typically less than one second. A normal Blast Day produces enough quantity of broken rock material to last about 7-10 days of normal aggregate production. Strata will schedule all blasting activities only during normal (daytime) business hours, trying to avoid the lunch hour whenever possible.
- Blast engineers have visited this site and determined the distance of all nearby homes. The estimated seismic and noise decibel levels of a controlled blast event traveling on a direct line of sight to the homes along Hwy 75, would create predicted noise and vibration levels that are very low and well within federal regulations.
- Due to the substantial distances from the mine area to nearby residences along US Hwy 75, our blast experts predict the seismic vibrations created will be negligible to the residential homes along US Hwy 75. For sake of comparison, a child slamming the front door in your home would likely cause much more vibration than would a normal blast event from this site.
- Noise created by the blasting will be audible, but well below harmful levels. A blast event produces a very short series of “thumping” sounds lasting about ½ second in total duration, which from the distances involved would be a similar noise decibel level to highway truck traffic at a 40-50 foot distance or a lawn mower 10-15 feet away (but with the noise levels being of much shorter duration).
- Although seismic vibration levels are most influenced by the distance between the blast point and the measurement point, noise levels are influenced by many factors beyond just the distances involved. Sound waves are *reduced* by increasing distance and are reflected away by obstructing surfaces such as rock outcrops, hills, sight & sound soil berms, buildings, trees, etc. Conversely, sound waves are *increased* by reducing distance and reflected by temperature inversions or heavy cloud cover (which can redirect sound waves back downwards).
- **Groundwater:** It is not known whether or not the mining activities at this site will encounter any groundwater within the granite bedrock. It is virtually impossible for any significant aquifers to exist in the bedrock, but it is likely one may encounter “seepage” of groundwater thru existing small cracks and fissures in the bedrock. The existing rock quarries just east of this site have not demonstrated any groundwater problems of this nature.
 - It is common for rock quarries to encounter groundwater, due to seepage through naturally occurring cracks and faults in the bedrock. If such groundwater is encountered at this site, the mine plan proposes to pump these waters into on-site settling ponds to dispose of any organic solids and to then reuse the clean water for our aggregate washing operations. If groundwater seepage into the quarry is experienced in quantities exceeding our ability to reuse them in the aggregate washing operations, those excessive quantities of clean water would be pumped back into the nearby river. If that were to happen, it would require securing a separate Water Discharge Permit in advance of any off-site discharge.
- **Reclamation:** Although the life of this quarry is expected to last into the next century, extensive reclamation efforts will be an ongoing and annual process concurrent with the active mining operations. Detailed Reclamation, Erosion Control and Stormwater Runoff Protection measures have been developed and will be implemented on this site. These plans are reviewed annually and modified as conditions change to insure a safe and environmentally sound site. Soil slopes and disturbances will be shaped, smoothed and reseeded to blend into the surrounding landscapes. There will not be blighted buildings, structures, spoil piles or other eye sores left behind once this project is completed. We believe the public will find this quarry, like all of our other sites, to be an exceptionally clean and well organized operation, both during and after its time in operation.



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- **Dust & Air Quality:** Due to the unique design of this quarry eliminating the vast majority of trucking activities, the amount of dust generated by these quarry operations will be substantially less than that of similar sized conventional quarries. Dust levels at this quarry will be monitored and regulated by the Mine Safety & Health Administration and will also require strict compliance with MPCA Air Quality Permit standards.
 - Dust generated from the crushing and screening operations will be controlled by an extensive dust suppression system (water misting and spray process at key dust generation points).
 - The quarry access road and other areas of routine travel will be surfaced with crushed rock to reduce dust. Should heavy truck transportation ever occur at this site creating excessive dust conditions, we will apply water or environmentally safe dust reducing agents to the roadway to minimize or control dust as conditions warrant.
 - In addition to state and federal regulatory inspections, we also engage independent laboratories to test noise and silica quartz dust exposures at our aggregate operations in an additional effort to protect the safety of our employees and any nearby neighborhoods. Employees working in and around the plant wear dust collection devices for their entire 8 hour shift, which are then submitted to an independent testing laboratory to be analyzed. Due to the use of our dust suppression systems, the levels found at our sites are well below permitted safety levels, with the results frequently being below the analytical laboratory limits of detection (meaning non-detectable). Noise, Dust and Silica levels at this site will be tested once operational with the results of those tests provided to Big Stone County Environmental Services.

- **Water Usage:** Once the granite bedrock has been reduced in size from the blasting process, it is then processed into finished aggregates through a series of crushing, screening and washing operations.
 - The primary aggregate product to be produced from this quarry will be Washed Concrete Rock which after it is produced, is then washed to remove dust and sand sized particles.
 - This project will require a DNR Water Appropriation Permit to enable it to pump water from the nearby Minnesota River for use in the Aggregate washing operations and dust suppression systems. These annual water needs at this site are estimated to be ±45 acre feet per year.
 - In an effort to conserve the amount of water used in the washing and dust suppression systems, we recycle and reuse the waters over and over again via a series of on-site settling ponds designed to clean the organic solids (sand & soils) from the water.

- **Visual Impacts:** The quarry and processing operations at this site will be located approximately ½ mile south / southwest of US Hwy 75. Due to the naturally occurring topography between our site and US Hwy 75, a large amount of the operations will be shielded from these highway viewpoints. In an effort to provide additional shielding, Strata will construct Sight & Sound Soil Berms in strategic locations around the northern exposures of this site. These soil berms will be shaped and seed to grass and will also have trees and shrubbery planted on their northern exposures to help them blend into the surrounding landscape and improve visual aesthetics.

- **Noise Impacts:** Sound levels from all sources (explosive detonations, processing equipment, heavy equipment, etc) at this site will be monitored and regulated by the Mine Safety & Health Administration to insure the safety of our employees as well as nearby neighborhoods.
 - Additional measures will be taken to help eliminate or minimize the annoyance of operational noise levels at this quarry, using a combination of naturally occurring topographical features and the construction of Sight & Sound Soil Berms to help deflect sound waves away from those residences along US Hwy 75.
 - Backup alarms on heavy equipment are required by federal regulations to warn people on the ground of equipment hazards. Unfortunately these backup alarms can also be annoying to nearby residences.
 - To address this problem, Strata will utilize a newly approved type of backup equipment alarm that produces a lower frequency, more subtle quacking noise instead of the high pitched beeping noise commonly found on heavy equipment. Using this type of backup alarm during daylight hours will substantially minimize or eliminate alarm disturbances.



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- For any nighttime operations that may occur, Strata will utilize an approved Flashing Strobe Light type of backup alarm to eliminate alarm noise altogether (strobes cannot be used for daylight operation).
- **BNSF Train Shipping of Aggregates:** This mine plan provides for a rail car load out facility utilizing newly constructed and existing rail infrastructure as the primary method to transport aggregates to end use locations hundreds of miles away.
 - This mine plan uses railroads as the primary method to ship the processed aggregates, which greatly reduces the heavy truck traffic normally associated with rock quarries. Although unplanned, conventional truck transportation may happen in the future and would represent a small fraction of our transportation activities.
 - To minimize the local train traffic, this rail car load out facility has been designed to accommodate large "90 Car Unit Trains", thereby substantially decreasing the frequency of train movements through the area.
 - This rail car loading facility includes an (optional) Railcar Loadout Building with sound insulation to totally encompass the rail cars being loaded, to shield nearby homes from the minor noise of the aggregates falling into the rail cars. If desired, this building could be eliminated to improve visual aesthetics.
 - One 90 Car Unit Train hauls the equivalent of 367 Truckloads of Aggregate. Rail versus truck transportation will substantially reduce the wear and tear on local streets and highways, the amount of fuels consumed (nearly four times as fuel efficient as trucks), as well as exhaust and dust pollution created by typical heavy truck traffic (1/3 less Co2 emissions than by truck).
 - In addition to being environmentally friendly, rail transportation helps to lower the cost of the finished aggregates.
 - We are frequently asked to identify the number and/or frequency of Aggregate Unit Trains that will be shipped and it is virtually impossible to predict the business demands that will drive that number. In the early years, it will likely start off being 1 Unit Train shipment every 1½ weeks, and growing to become 1 Unit Train every 4-5 days during latter years of operation.
 - Although typically done during daylight hours, BNSF Railway may drop-off and/or pick-up (loaded or empty) Aggregate Unit Trains at any time. Strata Corporation has no control over railroad operations.
- **Public Hearing:** Plans are underway to conduct a Public Hearing for this project, and it has been tentatively scheduled for January 5, 2012. Once confirmed, the scheduled date, time and location of this Public Hearing will be published. Strata will be on hand to make a detailed presentation, and answer any questions that might arise.

Strata Corporation has spent thousands of hours over the past several years in the design and development of this project. We believe we are now ready to move forward in taking this project from a conceptual idea to becoming a real business venture that can contribute to the success and pride of your community. We care very deeply about your community and its well being, and pledge to take every possible measure to eliminate or mitigate impacts to your neighborhood, your community and the environment.

We sincerely hope that we can earn your approval and trust, and that we may become a valued member of your local community.