**Green Tier Annual Report – 2014**

**Eden Stone Company/Valders Stone and Marble**

**W4520 Lime Road, Eden, Wisconsin**

**318 West Washington Street, Valders, Wisconsin**

## COMPANY BACKGROUND

Eden Stone Company/Valders Stone and Marble produces dimensional stone products for building, landscaping, decorating, and erosion control. With eight quarry sites in Wisconsin, each producing unique looking stone, we are able to offer our customers a diverse product line and unmatched stone blends for all of their natural stone needs. Stone produced by Eden Stone Company/Valders Stone and Marble has been sold around the country and around the world. At the facilities in Eden and Valders, we have a variety of saws, guillotines (rock splitters), routers, lathes, cutters, flamers, and grinders enabling us to produce just about anything from stone that can be imagined. Eden Stone Company/Valders Stone and Marble is committed to producing completely natural stone products while maintaining the highest environmental standards, conserving natural resources, and providing for the safety of our employees.

## ENVIRONMENTAL MANAGEMENT SYSTEM

Eden Stone/Valders Stone and Marble was accepted into the Green Tier program during April, 2013. The Environmental Management System was established in 2007 with the addition to the company of a full time Environmental Compliance Manager. Since then, a recycling program, petroleum spill prevention program, and an employee training program were established. Already in place were a storm water monitoring program, a hazardous material communication program, and nonmetallic mining reclamation programs for each of the eight quarries.

## ENVIRONMENTAL INITIATIVES

### Recycling

All of our facilities have an established recycling program. All steel, aluminum, paper, cardboard, glass, and plastic are recycled. Our goal is to ensure that all employees take part in the recycling program so that we may approach 100% material recycled. All used oil and combustible petroleum products are used to fuel the many oil burning furnaces that heat buildings in the Eden and Valders facilities. Wood from broken pallets is burned in portable furnaces that provide heat for employees working outdoors in the

quarries. In addition, scrap or waste rock generated as the result of nonmetallic mining activities at all of our facilities is used as fill, berm material, or road building material. It is also crushed into aggregate and used for a wide variety of applications. We utilize 100% of our natural rock product with zero waste.

A company-wide initiative is under way to inspect all stone stockpiles that are considered scrap. Many of these stockpiles have been around for decades and much of the stone that was considered waste in the past can now be utilized. The scrap that is being "re-purposed" is reducing the demand for new stone.

**Renewable Energy**

When constructing a new building to house several rock splitting machines at the Eden facility, it was decided to add geothermal heat to the building. The geothermal heat supplements a used motor oil-burning furnace to keep the building warm during the winter months and minimize the amount of natural gas used. The geothermal heat is installed in the floor and also serves to warm up cold rock so the rock does not shatter when it is split.

**Storm Water**

All of our externally drained facilities, which include the Eden, Valders, Jefferson Road, and the Paradise Road facilities, are covered by Storm Water Pollution Prevention Plans. These facilities are monitored quarterly to ensure that the quality of storm water runoff is within Wisconsin Department of Natural Resources (WDNR) guidelines.

At the Valders facility, we are taking an aggressive approach to control storm water runoff and alleviate flooding in the village of Valders and at our facility. The stream that flows through the village and the Valders facility is prone to flooding and, in the past, flood waters have threatened the gymnasium of the Valders Elementary School and filled the saw plant with several inches of water for extended periods of time. Instead of just adding additional storm water retention ponds, we are installing larger culverts, relocating the stream, and creating a wetland and wildlife habitat. This will enable storm water to more easily flow out of the village and through our facility.

**Reclamation**

Each of our nonmetallic mining facilities has an approved reclamation plan on file with the appropriate regulatory authority. In the case of the Paradise Road and Jefferson Road quarries, Chapter 30 and NR 340 permits are on file with the WDNR.

**Water Recycling**

Eden Stone Company/Valders Stone and Marble cuts stone at its Eden and Valders facilities using rock saws, routers, lathes, cutters, and grinders that are cooled and lubricated with a constant spray of water. The water also controls dust. Water purification systems have been installed in both facilities to remove suspended solids from the process water so that the water can be re-circulated and re-used over and over again. Table 1 summarizes the results of water re-circulation estimates for the Eden facility.

The water purification system in Eden is much smaller than the one in Valders because the saw shop in Eden is smaller. Nonetheless, the average daily water recirculation in Eden is 230,000 gallons. In Valders, the daily average calculated last year was nearly 750,000 gallons per day.

## Dust Suppression

At nonmetallic mining operations, dust is always a concern. All quarry haul roads are treated with retained storm when needed, to suppress dust and keep it from entering buildings or leaving the property.

Dry grinding operations are conducted in the Valders facility. Upgrades have been made to the dust filtration system to filter out more and finer dust particles, improving the health and safety of employees. Dust minimizing procedures have also been implemented in the Eden facility's splitter building. Rock splitters or guillotines use hydraulic pressure to split stone to specified dimensions. The building has seven guillotines and is equipped with water lines and hoses to wet the stone and conveyor belts greatly reducing dust throughout the building.

## Electricity Consumption

All of our stone processing, office, and maintenance buildings have been equipped with high efficiency fluorescent lighting. Automatic light switches, known as occupancy sensors, were installed in storage, lunch, and lavatory areas throughout our facilities to conserve electricity and extend bulb life.

A fleet of over-the-road trucks is maintained to ensure that our customers' delivery and transportation needs are met. Engine block heaters are used to guarantee the diesel engines start in cold weather. They are equipped with automated timers that begin heating the engines a few hours before the trucks are scheduled to be driven.

We have also installed the USES® System in the Valders Saw Plant, which reduces real power demand in two principal ways: through amperage reductions on the circuit, which reduce "Copper Losses", and through the reduction of the Total Harmonic Distortion in the amperage and voltage supplied to operating loads, which improves motor efficiency. It is projected that this system will save more than $120,000 over the next seven years. A case study conducted by Wisconsin Strategic Energy concluded that there would be an annual reduction of 133,217 kilowatt hours resulting in a savings of $18,650.42

Variable Frequency Drives (VFDs) were installed on all large motors in the Valders facility. VFDs control the speed of the motor by controlling the frequency of the electric power sent to the motor eliminating large power spikes and reducing wear and tear on the motors. Amp Followers were also added to increase saw productivity and reduce unengaged run time.

A compressed air audit was conducted in the Valders stone processing plant to reduce air leakage and minimize compressor run times. As a result, off duty compressed air pressure maintenance is accomplished by using a 5 horse power compressor instead of the 125 horsepower compressor needed during production periods.

## Spill Containment

There have been no reportable releases of petroleum or other hazardous chemicals at any of Eden Stone/Valders Stone and Marble's facilities since the Environmental Management System was established during 2007. A Spill Prevention, Control, and Countermeasure (SPCC) Plan has been implemented for each of three facilities where they are required. All company employees are trained annually at the Health, Safety, and Environmental training session in all aspects of the SPCC Plan. All chemicals and petroleum products are regularly inventoried and properly stored. Safety Data Sheets and Material Safety Data Sheets are kept on file for all chemicals. All data sheets are accessible by all employees both electronically and via paper copy. Employees receive annual training on the use and location of the data sheets.

## CONCLUSIONS

Eden Stone Company/Valders Stone & Marble has been a member of the Green Tier program since April 2013. The Environmental Management System has implemented several environmental programs and initiatives as well as re-emphasize those already in place.

It was calculated that nearly 1,000,000 gallons of water per day used in the stone cutting process is recirculated in the Eden and Valders facilities combined. A run-time meter was installed in the Eden facility on the recirculation water pump to enable us to calculate the amount of water recirculated. Table 1 shows the results. However in Valders, VFDs were installed on the pumps so they no longer pump at a constant rate. This was done because as the pumps aged, they became less efficient. In order to keep up with water demand, they were run at higher, variable rates and cycled on and off more frequently.

Several steps have been taken to reduce the demand for electrical power company wide. Tables 2 and 3 tabulate electricity use for the Eden and Valders facilities, respectively. In Eden, the amount of electricity used as well as the cost significantly increased. In Valders, the amount used increased while costs have been dramatically reduced. It is assumed that the cost reduction in Valders is the result of sequential start up procedures on high energy machines during both peak and non-peak demand times. We have not yet determined exactly how to compare electricity costs from one year to the next in either of the facilities. There is such a wide variation in stone cutting that it is difficult to use the square footage or other measures of production as a gage (i.e., some small items take a lot of machine time). Presently, we are discussing the installation of individual timers that will record the run time for each of our machines. It is hoped that this will provide a more direct measure of electricity consumption.

Our goals are to:

- Accurately quantify the electricity savings resulting from our many energy saving installations and modifications.
- Attain 100% employee participation in the recycling program.
- Continue to suppress and control dust in our quarries and production facilities.
- Monitor and control storm water runoff.
- Prevent petroleum and chemical releases and in the event of a release, minimize the effect on the environment.
- Manage all nonmetallic mining operations in accordance with their applicable reclamation plan.
- Continue to provide a safe and healthy work place environment for our employees.

**Table 1, Recirculated Water, Eden Stone Co., Eden Facility**

| Date Time | Cumulative Meter (Hours) | Days in Cycle | Minutes Pumped (Cycle) | Pump Rate (GPM) | Gallons Pumped (Cycle) | Average Recirculated per Day (Cycle) |
|---|---|---|---|---|---|---|
| 2/5/15 13:30 | 0 | 0 | 0 | 560 | 0 | 0 |
| 2/6/15 8:15 | 3 | 0.78 | 180 | 560 | 100,800 | 129,024 |
| 2/13/15 9:05 | 41 | 7.03 | 2280 | 560 | 1,276,800 | 181,500 |
| 2/16/15 13:30 | 52 | 3.18 | 660 | 560 | 369,600 | 116,079 |
| 2/24/15 11:46 | 104 | 7.93 | 3120 | 560 | 1,747,200 | 220,390 |
| 3/4/15 8:00 | 156 | 7.84 | 3120 | 560 | 1,747,200 | 222,770 |
| 3/10/15 9:15 | 201 | 6.05 | 2700 | 560 | 1,512,000 | 249,831 |
| 3/23/15 12:00 | 322 | 13.11 | 7260 | 560 | 4,065,600 | 310,006 |
| 4/8/15 12:58 | 483 | 16.04 | 9660 | 560 | 5,409,600 | 337,251 |
| 4/13/15 8:15 | 529 | 4.80 | 2760 | 560 | 1,545,600 | 321,767 |

Average = 232,069 gallon per day

**Table 2, Energy Consumption, Eden Facility, 2013 vs 2014**

| Meter(s) | Location | Kwh | Cost | Year |
|---|---|---|---|---|
| PBXZT90141 | Saw shop NE | 68,120 | $9,718.50 | 2013 |
| PBXZT2833-PVZT438567 | Saw shop NE | 119,560 | $21,076.85 | 2013 |
| PVXZT90665-PVXZT44181 | Office NE | 74,106 | $10,119.83 | 2013 |
| BZ883690-BZ846889 | Stone Storage SW | 3,167 | $399.98 | 2013 |
| PVXZT82060 | Weld Shop SE | 19,400 | $12,569.69 | 2013 |
| PBXZT1512-PVXZT86195 | Old Maint Shop NE | 300,480 | $45,054.81 | 2013 |
| PVXZT81817-PXZT86194 | Splitter Bldg NE | 140,560 | $23,028.51 | 2013 |
| BZ780078-BZ766252 | Pole | 1,023 | $248.25 | 2013 |
| **TOTAL** | | **726,416** | **$122,216.42** | |

| Meter(s) | Location | Kwh | Cost | Year |
|---|---|---|---|---|
| PBXZT90141 | Saw shop NE | 78,320 | $11,090.70 | 2014 |
| PVZT438567 | Saw shop NE | 153,760 | $24,289.75 | 2014 |
| PVXZT89001 | Office NE | 93,541 | $13,861.53 | 2014 |
| BZ846889 | Stone Storage SW | 2,201 | $446.30 | 2014 |
| PVXZT86550 | Weld Shop SE | 91,680 | $14,200.62 | 2014 |
| PVXZT86195 | Old Maint Shop NE | 376,080 | $52,582.58 | 2014 |
| PVXZT86194 | Splitter Bldg NE | 184,560 | $29,215.92 | 2014 |
| BZ766252 | Pole | 605 | $199.81 | 2014 |
| **TOTAL** | | **980,747** | **$145,887.21** | |

**Table 3, Energy Consumption, Valders Facility, 2013 vs 2014**

| Date | Kwh | Cost |
|---|---|---|
| 1/21/2013 | 97,360 | $22,706.85 |
| 2/18/2013 | 75,920 | $18,914.24 |
| 3/20/2013 | 98,800 | $22,076.47 |
| 4/17/2013 | 96,320 | $22,147.66 |
| 5/20/2013 | 119,520 | $25,893.17 |
| 6/20/2013 | 141,200 | $19,270.78 |
| 7/18/2013 | 131,600 | $20,026.98 |
| 8/20/2013 | 117,280 | $20,300.87 |
| 9/17/2013 | 118,240 | $19,209.78 |
| 10/17/2013 | 128,640 | $19,661.70 |
| 11/18/2013 | 133,440 | $19,068.96 |
| 12/17/2013 | 137,280 | $14,458.33 |
| **Total** | **1,395,600** | **$243,735.79** |

| Date | Kwh | Cost |
|---|---|---|
| 1/28/2014 | 161,048 | $15,009.91 |
| 2/27/2014 | 190,164 | $16,462.43 |
| 3/27/2014 | 177,088 | $15,968.34 |
| 4/28/2014 | 196,881 | $16,900.98 |
| 5/29/2014 | 205,125 | $17,150.10 |
| 6/26/2014 | 190,165 | $19,523.94 |
| 7/29/2014 | 206,629 | $20,529.81 |
| 8/27/2014 | 186,635 | $17,720.88 |
| 9/26/2014 | 178,190 | $18,081.05 |
| 10/28/2014 | 180,036 | $16,023.78 |
| 11/26/2014 | 160,768 | $14,879.83 |
| 12/30/2014 | 148,043 | $14,269.23 |
| **Total** | **2,180,772** | **$202,520.28** |