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March 21, 2013

Scott E. Sheeley, Regional Permit Administrator
New York State Department of Environmental Conservation
6274 East Avon-Lima Road
Avon, New York 14414

RE: Frontier Stone LLC, Proposed Shelby Quarry – DEIS Information Request
Town of Shelby, Orleans County
DEC Application No. 8-3436-00033/00001

Dear Scott:

In response to the Department's February 15, 2013 request for additional information for the above captioned site, the Applicant offers the following.

Comment 1: Air Quality:

a. **Section 4.1.3 of the revised Draft EIS indicates that the processing equipment will operate under a DEC-issued air permit. However, we were still unable to locate information in the Draft EIS or Mined Land Use Plan that indicates the specific capacities of the processing equipment in tons per hour and any other information relevant to determining potential emissions of regulated containments.**

b. **The Draft EIS contains a summary of potential fine particulate matter emissions for purposes of addressing DEC's policy on fine particulate matter (CP-33). However, the potential emissions inventory provided in Section 4.1.3 (Table 14) of the Draft EIS only includes sources from processing equipment. To adequately address the DEC's policy, the particulate matter emissions inventory must also estimate emissions from non-process, fugitive sources (e.g., traffic on unpaved roads, material stockpiles, other areas of exposed soils, etc.). Please revise Section 4.1.3 to add non-process, fugitive particulate matter sources to the emissions inventory. The methods, calculations and assumptions for emission estimates should also be provided in the appendix of the Draft EIS. If the potential fine particulate matter emissions would exceed the 15 tons/year threshold contained in DEC Policy CP-33, the additional modeling required by the policy would also need to be included in the revised Draft EIS.**

Response:

4.1.3 Air Resources

As stated in Section 3.1.3, any potential impacts to air quality will be primarily due to particulate matter (PM) from site preparation (clearing), aggregate processing operations, blasting, and truck traffic. Site preparation and blasting are temporary in nature and are generally of short duration. Numerous factors influence the amount of particulate emissions from a stone quarry and associated processing operations or hauling activities. These factors include: emission controls installed on equipment, such as spray bars; engineered emission control practices implemented at the facility, such as use of chemicals or water to suppress dust on roads, and surface improvements; efficient blasting practices; type, nature and moisture content of rock; weather conditions; truck type, size and speed. Controlling vehicle speed, route restrictions, surface treatment and surface improvements can reduce dust impacts from haul roads and truck traffic. Other emissions (NOx, VOCs, SOx, CO) occur from fuel combustion sources such as vehicles. The processing equipment will run on line power, eliminating the need for a generator and eliminating potential impacts from stationary combustion emissions.

The proposed entrance for customer truck traffic is on Sour Springs Road, providing the shortest access route to the processing plant area. An alternative access for customer trucks to the processing plant area enters and exits from Fletcher Chapel Road, to the north of the quarry.

As stated above, customer trucks would enter the quarry from Sour Springs Road and proceed to the processing plant area, which will be located directly between the Phase 1 and Phase 4 project areas approximately 800-1000 feet from Sour Springs Road, as designated on the Mining Plan Map. Under the alternative, customer trucks would enter the quarry from Fletcher Chapel Road and proceed to the processing plant area. The entrance road from Fletcher Chapel Road to the processing plant would be approximately twice as long as the proposed entrance route from Sour Springs Road (approximately 2000 feet).

The aggregate processing plant, which includes crushers, screens and conveyors, will operate under a DEC-issued air permit. While the processing plant is not yet purchased, based upon standard configurations and type of equipment used at comparable mineral processing operations, Frontier proposes a plant configuration as depicted in Figure 5 of the Mined Land Use Plan. The equipment consists of a primary and secondary crusher, triple deck screen, single deck screens (2), and conveyors. Frontier anticipates the rated capacities of its primary and secondary crusher will range from 150-450 tons per hour. Tables 14 through 17 provide the estimated particulate emissions using AP-42 emissions factors for the processing equipment identified above. Emissions calculations are dependent on production rate or throughput, estimated at 350,000 tons per year, and which will vary upon market demand, and is independent of rated equipment capacities. Variations in the rated capacities of the equipment will not change the calculated particulate emissions in the following tables.

The applicant proposes using field conveyors, when practicable, eliminating particulate emissions from roads by use of on-site haul vehicles that would otherwise be used to transport aggregate material from the primary crusher to the processing plant. This will also eliminate combustion emissions generated from the truck engines, as well as any associated noise. Further mitigation of particulates can be achieved through watering or surfacing of the access road, using water spray bars on processing equipment, and efficient customer truck routing.

Non-process emission sources

As stated in the Mined Land Use Plan, the primary crusher would be located near the active mine face, with a loader transporting the blasted rock (muck pile) to the crusher for initial crushing. The particulate emissions generated by the loader movement have been estimated and provided in Tables 14-17. The emissions are calculated using equations in AP-42 Section 13.2.2 and account for natural mitigation (precipitation), as well as water suppression which is proposed in the Mined Land Use Plan as one of many engineered controls as part of comprehensive Dust Control Plan. Section 13.2.2 Equation 1a provides a method to determine the emission factor for unpaved industrial roads, which is expressed in pounds per vehicle mile traveled. Equation 1a does not take into account emissions controls, either from natural mitigation or from engineered controls. Section 13.2.2 further provides an equation accounting for natural mitigation due to precipitation, which is extrapolated using Equation 2, and then applied to equation 1a. Using the number of days of measurable precipitation (>.01 inch), the resulting emission factor accounts for precipitation on an annual average basis. The precipitation data used in this case was obtained from the NOAA, National Climatic Data Center for Rochester station 14768 for the year 2012.

Tables 14 and 15 include estimates of particulate emissions produced from customer trucks entering and exiting from Sour Springs Road. Tables 16 and 17 include estimates of particulate emissions produced from customer trucks entering and exiting from Fletcher Chapel Road. As stated above, access from Fletcher Chapel Road is proposed as an alternative to Sour Springs Road. Again, equations in AP-42

Section 13.2.2 are used and the figures account for natural mitigation and water suppression. A control efficiency for watering was applied to the emissions calculations based on Figure 13.2.2-2, which shows the relationship between the moisture ratio of an unpaved road and the resulting control efficiency. A small increase in moisture content results in a large increase in control efficiency. Using Figure in 13.2.2-2, a 75% control efficiency was applied to the emissions estimates for the customer access road, based on proposed use of a water truck.

Also included on Tables 14 through 17 are estimates of particulate emissions from storage piles from activity (loading and unloading) and from wind erosion. The emissions from storage piles are calculated using EPA AP-42 emissions factors. Emissions for storage pile wind erosion are calculated using an alternative method as derived from EPA AP-42 and as adopted by state air control agencies in the Western Regional Air Partnership.[1]

As evidenced in the following tables, emissions from Frontier's operations will be limited so as to allow registration of the facility under cap-by-rule provisions of New York State air regulations, which limit emissions to 50% below Title V thresholds. Frontier will maintain records pursuant to regulations which demonstrate compliance with its registration.

As stated in Section 3.1.3, if primary PM10 (or accurate measures of PM2.5) emissions from the project are less than 15 tons per year, then according to DEC Policy CP-33, the PM2.5 impacts from the project are insignificant and no further assessment is required. Estimated emissions were based upon a projected production of 350,000 tons per year of aggregate. While this will vary according to market demand, the calculations below document that PM2.5 emissions are well within the threshold limits of 15 tons per year in DEC's Policy CP-33, and in accordance with the Policy which requires no further impact assessment. Supporting calculations for process and non-process emissions are provided in the Appendix 12.

[1] *www.nmenv.state.nm.us/aqb/documents/FD**Handbook**_Rev_06.pdf*

Table 14: Projected PM2.5 Emissions: Process and Non-process Sources Customer Road access at Sour Springs Road

		Thruput (tons/yr)	Emission Factor	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (tpy)
Primary Crusher*	CR-1	350,000	1.00E-05	3.5	0.00175
Secondary Crusher*	CR-2	350,000	1.00E-05	3.5	0.00175
Triple Deck Screen	SCR-3	350,000	5.00E-05	52.5	0.02625
Single Deck Screen	SCR-1	350,000	5.00E-05	17.5	0.00875
Single Deck Screen	SCR-2	350,000	5.00E-05	17.5	0.00875
Conveyor Belts (5 controlled)		350,000	1.30E-05	22.75	0.011375
Internal Road (Loader to crusher)		350,000	.195	1034.72	0.52
Access Road (customer trucks)		350,000	.23	305.67	.15
Storage Pile (loading)		350,000	.0018	635.53	0.32
Storage Pile (wind erosion)		350,000	0.14	5.11	.01
TOTAL				2098.28	1.04914

Table 15: Projected PM10 Emissions: Process and Non-process Sources Customer Road access at Sour Springs Road

		Thruput	Emission Factor	PM10 Emissions (lb/yr)	PM10 Emissions (tpy)
Primary Crusher*	CR-1	350,000	5.40E-04	189	0.0945
Secondary Crusher*	CR-2	350,000	5.40E-04	189	0.0945
Triple Deck Screen	SCR-3	350,000	7.40E-04	777	0.3885
Single Deck Screen	SCR-1	350,000	7.40E-04	259	0.1295
Single Deck Screen	SCR-2	350,000	7.40E-04	259	0.1295
Conveyor Belts (5 controlled)		350,000	4.60E-05	80.5	0.04025
Internal Road (Loader to crusher)		350,000	1.95	10347.18	5.17
Customer Road		350,000	2.31	3056.66	1.53
Storage Pile (loading)		350,000	0.012	4196	2.10
Storage Pile (wind erosion)		350,000	0.91	133.68	.07
TOTAL				**19487.02**	**9.75**

Table 16: Projected PM2.5 Emissions: Process and Non-process Sources Customer Road access at Fletcher Chapel Road

		Thruput (tons/yr)	Emission Factor	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (tpy)
Primary Crusher*	CR-1	350,000	1.00E-05	3.5	0.00175
Secondary Crusher*	CR-2	350,000	1.00E-05	3.5	0.00175
Triple Deck Screen	SCR-3	350,000	5.00E-05	52.5	0.02625
Single Deck Screen	SCR-1	350,000	5.00E-05	17.5	0.00875
Single Deck Screen	SCR-2	350,000	5.00E-05	17.5	0.00875
Conveyor Belts (5 controlled)		350,000	1.30E-05	22.75	0.011375
Internal Road (Loader to crusher)		350,000	.195	1034.72	0.52
Access Road (customer trucks)		350,000	.231	611.33	0.31
Storage Pile (loading)		350,000	.0018	635.53	0.32
Storage Pile (wind erosion)		350,000	0.14	5.11	.01
TOTAL				2403.94	1.22

Table 17: Projected PM10 Emissions: Process and Non-process Sources Customer Road access at Fletcher Chapel Road

		Thruput	Emission Factor	PM10 Emissions (lb/yr)	PM10 Emissions (tpy)
Primary Crusher*	CR-1	350,000	5.40E-04	189	0.0945
Secondary Crusher*	CR-2	350,000	5.40E-04	189	0.0945
Triple Deck Screen	SCR-3	350,000	7.40E-04	777	0.3885
Single Deck Screen	SCR-1	350,000	7.40E-04	259	0.1295
Single Deck Screen	SCR-2	350,000	7.40E-04	259	0.1295
Conveyor Belts (5 controlled)		350,000	4.60E-05	80.5	0.04025
Internal Road (Loader to crusher)		350,000	1.95	10347.18	5.17
Customer Road		350,000	2.31	6113	3.06
Storage Pile (loading)		350,000	0.012	4196	2.10
Storage Pile (wind erosion)		350,000	0.91	133.68	.07
TOTAL				**22543.36**	**11.28**

Comment 2: Traffic: The revised Draft EIS now contains two reports in Appendix 8 related to traffic: one report dated June, 2012 and another report last revised January 2013. These traffic studies provide differing daily and hourly truck volume estimates. In addition, Section 4.2.3 of the Draft EIS discusses a maximum, "worst case" truck traffic volume of 30 trucks per hour. However, the January 2013 Traffic Study indicates the peak truck traffic volume would be up to 60 trucks per hour (entering and exiting combined). The revised Draft EIS should provide an analysis based on accurate and consistent traffic estimates. Accordingly, a maximum of 60 trucks per hour should be reflected in the Draft EIS discussion contained in Sections 1.2.3.5 and 4.2.3 and the conflicting information contained in the June 2012 and January 2013 traffic analyses should be reconciled or combined into a single traffic study for this proposal.

Response: The reference to Section 1.2.3.5 should be Section 1.3.2.5. This section refers to the project generating 8 to 10 trucks per hour on the average. This is a one-way figure. The Department requested a maximum figure, however, a "worst case". As stated in 1.3.2.5, that number will be 30 trucks per hour (one-way).

In Section 4.2.3, the same numbers of truck trips are consistently used, 8 to 10 (one-way) for the average and 30 truck trips (one-way) for a worst case.

The original traffic study done for the site in June 2007 used a typical traffic scenario of 8 truck trips (one-way) as a basis for the study. This was revised in January 2013 to reflect the Department's request for a maximum traffic generation number. On page 4 of the report the first line states ***"8 trucks entering and exiting the site."*** The next paragraph states:

> **"Under an unlikely worst case scenario, the quarry was assumed to generate a maximum 30 vehicles entering and exiting the site during the peak hours totaling 60 total truck trips generated during the AM and PM peak hours. This hypothetical worst case condition was also evaluated.".**

At the request of the DEC, a traffic study was done in June 2012 for trucks using Fletcher Chapel Road as an alternative traffic route. As stated on page IV and V:

> **"The Frontier Stone Quarry is anticipated to generate approximately 240 trips per day with a maximum of 30 trucks entering and exiting the site during the peak hours based on 220 working days/year, 8 hour daily shifts and an average truck capacity of 25 tons."**

All studies appear consistent. The anticipated average truck traffic is about 8 trips (one-way) per hour and a worst case, if and when it ever happens, would be 30 trips (one-way) per hour. We believe both studies are consistent and each analyzes a different route with the worst case in mind, thus both studies provide value and should be included.

Comment 3: Noise: Based on a review of the noise analysis provided in Section 4.2.6 of the Draft EIS, the following items should be addressed:

a. **Based on the locations of noise receptors provided Figure 11, Tables 13 and 16 appear to have receptor locations S-4 and S-5 switched.**

Response: You are correct; this typographical error will be corrected.

b. **A figure showing the locations of mine operating scenarios described on page 159 would be helpful.**

Response: The following diagram is being supplied.

c. **The noise source in Table 21 is unclear, and does not appear to reflect the addition of sources under scenarios 1-3, which would appear to be approximately 76 dBA.**

Response: The noise sources for table 21 are as follows as shown in Appendix 9.

Process Plant	71 dB(A) @ 200 ft.
In-pit Loader and Crusher	71 dB(A) @ 200 ft.
Rock Drill	68 dB(A) @ 200 ft.

The three resulting noise levels at the receptor 1 station are (see calculations, Appendix 9, Level 1)

- loader, crusher, drill.....62.1 dBA
- processing plant.....54.7 dBA
- ambient average.....49.3 dBA

Combining these results in a 63.1 dBA level.

At receptor station 2, the three resulting noise levels at the site are:

- loader, crusher, drill.....69.5 dBA
- processing plant.....54.7 dBA
- ambient average.....52.2 dBA

Combining these results in a 69.5 dBA level.

At receptor station 3, the three resulting noise levels at the site are:

- loader, crusher, drill.....69.5 dBA
- processing plant.....45.7 dBA
- ambient average.....51.1 dBA

Combining these results in a 69.5 dBA level.

There were typographical errors on the Sound Level Calculations in Appendix 9, the calculations were checked again and they were, however, correct. The revised sheet follows.

SOUND LEVEL CALCULATIONS

LEVEL 1

Receptor Station 1, Scenario 1

Formula: SPL2 = SPL1 + 20 log (d1/d2)

Assume:

Process Plant	71 dB(A) @ 200 ft.
In-pit Loader and crusher	71 dB(A) @ 200 ft.
Rock Drill	68 dB(A) @ 200 ft.
SLD to structure:	1300' from plant
SLD to structure:	700' from pit

SPL2 = 71 + 20 log (200/1300)
SPL2 = 54.7 dB(A) from process plant

SPL1 = 68 dB(A) + 71 dB(A) = 73 dB(A)

SPL2 = 73 + 20 log (200/700)

SPL2 = 62.1 dB(A) from loader, crusher and drill

TOTAL @ receptor = 54.7 dB(A) + 62.1 dB(A) + 49.3 dB(A) = 63.1 dB(A)

Receptor Station 2, Scenario 2

Assume:

Process Plant	71 dB(A) @ 200 ft.
In-pit Loader and crusher	71 dB(A) @ 200 ft.
Rock Drill	68 dB(A) @ 200 ft.
SLD to structure:	1300' from plant
SLD to structure:	300' from pit

SPL2 = 71 + 20 log (200/1300)
SPL2 = 54.7 dB(A) from process plant

SPL1 = 68 dB(A) + 71 dB(A) = 73 dB(A)

SPL2 = 73 + 20 log (200/300)

SPL2 = 69.5 dB(A) from loader, crusher and drill

TOTAL @ receptor = 54.7 dB(A) + 69.5 dB(A) + 52.2 dB(A) = 69.5 dB(A)

Receptor Station 3, Scenario 3

Assume:

Process Plant	71 dB(A) @ 200 ft.
In-pit Loader and crusher	71 dB(A) @ 200 ft.
Rock Drill	68 dB(A) @ 200 ft.
SLD to structure:	3700' from plant
SLD to structure:	300' from pit

SPL2 = 71 + 20 log (200/3700)
SPL2 = 45.7 dB(A) from process plant

SPL1 = 68 dB(A) + 71 dB(A) = 73 dB(A)

SPL2 = 73 + 20 log (200/300)

SPL2 = 69.5 dB(A) from pit

TOTAL @ receptor = 45.7 dB(A) + 69.5 dB(A) 51.1 dB(A) = 69.5 dB(A)

d. **Some of the distances provided in Level 1 calculations in Appendix 9, do not match the distances between receptors and excavation phases provided in Table 16. It is unclear why there is a difference in the distances use. Please clarify.**

Response: Over the past 5 years there have been adjustments to the map with updated orthophotos, etc. Also note the heading has now been changed from "Distance to Closest Excavation Phase" to "Distance to Closest Equipment". The revisions should make things consistent.

e. **It is unclear why an additive source noise level of 75 dBA is used for evaluating potential impacts on the Job Corps Center. This is not consistent with the calculations in Appendix for Scenarios 1-3. In addition, we note that the source noise value for the loader/crusher in evaluating the Job Corps Center (p. 160) is 71 dBA, whereas it is shown as 72 dBA elsewhere in the analysis.**

Response: A basic noise attenuation was used for Table 21 calculations by using simple hand calculations. The Inverse Square Formula will now be calculated to compare and would result in the following. The 71 dBA figure is now used consistently.

Schoolhouse Marsh:

Combine 43.96 dBA from processing plant
48.39 dBA from loader, etc.
54.8 dBA from ambient

Cumulative Result is: 55.8 dBA

Job Corp Center:

Combine 43.4 dBA from processing plant
48.65 dBA from loader, etc.
55.3 dBA from ambient

Cumulative Result is: 56.3 dBA

Ringneck Marsh:

Combine 39.78 dBA from processing plant
43.03 dBA from loader, etc.
48.0 dBA from ambient

Cumulative Result is: 50 dBA

The formula results match closely the "hand" calculations. It should be emphasized that the project impacts are very conservative. The projected project cumulative sound levels do not account for a modest 10 dBA decreases due to vegetation.

Formula calculations are shown below.

Table 16: Ambient Sound Level Data

Station Location	Description	Distance to Process Plant	Distance to Closest Equipment	Ambient Noise L_{eq} dB(A)
S-1 AM	Sour Spring Road Residences	1300± ft.	700± ft.	53.9
S-1 PM	Sour Spring Road Residences	1300± ft.	700± ft.	44.7
S-2 AM	NW corner of property along Fletcher Chapel Rd	1300± ft.	300± ft.	56.6
S-2 PM	NW corner of property along Fletcher Chapel Rd	1300± ft.	300± ft.	47.7
S-3 AM	NE corner of property along Fletcher Chapel Rd	3700± ft.	300± ft.	48.2
S-3 PM	NE corner of property along Fletcher Chapel Rd	3700± ft.	300± ft.	54.0
S-4	Proposed process plant site	NA	NA	46.8
S-5	SE corner of site	NA	NA	44.3

Schoolhouse Marsh Overlook

Distance to Overlook: 4500' from processing plant
3400' from pit

SPL2 = 71 + 20 log (200'/4500') = (-27.04)

SPL2 = 43.96

SPL2 = 73 + 20 log (200'/3400') = (-24.61)

SPL2 = 48.39

Job Corp. Center

Assume:

Process Plant	71 dB(A) @ 200 ft.
In-pit Loader and crusher	71 dB(A) @ 200 ft.
Rock Drill	68 dB(A) @ 200 ft.
Distance to Structure:	4800' from plant
	3400' from pit

SPL2 = 71 + 20 log (200'/4800') = (-27.60)

SPL2 = 43.4

SPL2 = 73 + 20 log (200'/3400') = (-24.35)

SPL2 = 48.65

Ringneck Marsh Overlook

Distance to Overlook: 7275' from processing plant
6300' from pit

SPL2 = 71 + 20 log (200'/7275') = (-31.22)

SPL2 = 39.78

SPL2 = 73 + 20 log (200'/6300') = (-29.97)

SPL2 = 43.03

f. **A figure should be added to the Draft EIS to show the locations and distances from the mine, of the other receptors discussed on page 161: Job Corps Center, Schoolhouse Marsh and Ringneck Marsh.**

Response: See previous diagram.

g. **No data is provided in the Draft EIS or Appendix 9 for ambient noise measurements presented in Table 22. The data records must be provided in Appendix 9 or in the Draft EIS.**

Response: The ambient noise measurements are shown on Plate 2 of the DEIS. The technical data are in Appendix 9 as Set-UP #4 (Schoolhouse Marsh Overlook), Set-UP 5B (Ringneck Marsh Overlook) and Set-UP 3 (Job Corp Center).

h. **There appears to be an incorrect reference to Table 23 on page 161 of the Draft EIS. It appears that it should reference Table 24 instead.**

Response: There is no reference to Table 23 on page 161. The reference to Table 23 on page 162 is correct.

Comment 4: Cultural Resources: The Department supports the discussion in the revised Draft EIS that reflects the limited nature of the Phase 1B testing performed and the need for additional Phase 1B archeological testing and Office of Parks Recreation and Historic Preservation (OPRHP) review for proposed mine phases 2 and 3 prior to any mining activities being conducted in those phases. In addition, the Draft EIS acknowledges that the results of any additional phase 1B testing and review by OPRHP will determine the need for further archeological investigations for proposed mining phases 2 and 3. However, Section 5.2.7 of the Draft EIS should indicate that, upon consultation with OPRHP and DEC, mitigation measures will be implemented to avoid or mitigate impacts to any sites identified during further archeological investigations conducted in mining Phases 2 and 3.

Response: Section 5.2.7 will be revised to reflect this wording.

No cultural resources have been identified for the permit term proposed disturbed area, therefore, no mitigation is proposed. Frontier will have a phase 1B survey completed of the two remaining mine phases prior to commencement of mining there. However, in light of the recent study, it is anticipated that no resources will be found.

add: "Upon consultation with OPRHP and DEC, mitigation measures will be implemented to avoid or mitigate impacts to any sites identified during further archeological investigations conducted in Phases 2 and 3".

Comment 5: Fish and Wildlife: In addition to the above a few miscellaneous, minor corrections and comments regarding fish and wildlife should be addressed at the same time:

a. **Page 15 of the Draft EIS indicates that operation of the mine would not coincide with deer hunting season. However, early bow season now begins on October 1st in the southern zone, with the regular season beginning the third Saturday of November. If the quarry operates April to November deer hunting will coincide with the quarry operation.**

b. **The September 2012 response letter stated that a typical blast will attenuate to ambient dBA levels at a distance of about 500 feet into the INWR. This information should be included in the discussion on Page 27 and in the summary on Page 29 of Appendix 6.**

c. **Osprey is listed in Table 3 of Appendix 6, "Wildlife Observations on the Proposed Shelby Quarry Site 2006 – 2010" and in Table 5B, "Birds Recorded Per 10-Minute Point County Adjacent to Oak Orchard Ridge Road and Sour Springs Road". Because Osprey is a state species of special concern, some discussion should be included regarding this species since it was observed on the site (for instance it should be included when species of special concern are mentioned and discussed). There are currently two active osprey nests on the nearby Ring Neck Marsh.**

d. **On page 11 of Appendix 6 it states "there are a total of four known bald eagle nest sites within the INWR and the adjoining Tonawanda Wildlife Management Area". This should be corrected to state that there are four known bald eagle nests within the INWR and adjoining Tonawanda and Oak Orchard Wildlife Management Areas.**

Responses: Responses to Comment 5 are attached. Only pages referenced in the comment that are contained in Appendix 6 are provided (not the entire Appendix 6).

Scott, please review these responses, we will incorporate them in the DEIS upon your acceptance.

Best regards,

John R. Hellert
Senior Geologist

JRH/acf

APPENDED

1. **Bow Hunting Revision Statement**
2. **Air Calculations**
3. **Revised Portions of TES's Appendix 6**

APPENDIX 1

Bow Hunting Revisions Statement

Bow Hunting

There will be overlap of the early bow season for deer that begins on October 1 with quarry operations. The month of October is near the end of the production season. In any event, deer are commonly seen around the perimeter of active quarries.

APPENDIX 2

Air Calculations

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AIR EMISSIONS CALCULATIONS

Processing Plant

Emissions calculations for PM2.5

		Thruput	Emission Factor	PM2.5 Emissions	Control Efficiency	PM2.5 Emissions	
Primary Crusher*	CR-1	350,000	1.00E-05	3.5	0%	3.5	0.00175
Secondary Crusher*	CR-2	350,000	1.00E-05	3.5	0%	3.5	0.00175
Triple Deck Screen	SCR-3	350,000	5.00E-05	52.5	0%	52.5	0.02625
Single Deck Screen	SCR-1	350,000	5.00E-05	17.5	0%	17.5	0.00875
Single Deck Screen	SCR-2	350,000	5.00E-05	17.5	0%	17.5	0.00875
Conveyor Belts (5 controlled)		350,000	1.30E-05	22.75	0%	22.75	0.011375
					TOTAL PM2.5 (lbs/yr)	117	0.058625
					TOTAL PM2.5 (tons/yr)	**0.058625**	

***No AP42 Emission factor available, AIRS uncontrolled factor used for primary & secondary crusher**

Emissions calculations for PM10

		Thruput	Emission Factor	PM10 Emissions	Control Efficiency	PM10 Emissions	
Primary Crusher*	CR-1	350,000	5.40E-04	189	0%	189	0.0945
Secondary Crusher*	CR-2	350,000	5.40E-04	189	0%	189	0.0945
Triple Deck Screen	SCR-3	350,000	7.40E-04	777	0%	777	0.3885
Single Deck Screen	SCR-1	350,000	7.40E-04	259	0%	259	0.1295
Single Deck Screen	SCR-2	350,000	7.40E-04	259	0%	259	0.1295
Conveyor Belts (5 controlled)		350,000	4.60E-05	80.5	0%	80.5	0.04025
					TOTAL PM10 (lbs/yr)	1,754	0.8768
					TOTAL PM10 (tons/yr)	**0.8768**	

Facility will run on line-power (no stationary combustion sources)

FRONTIER STONE, LLC
DEC ID #8-3436-00033
STORAGE PILES- WIND EROSION-PM-2.5

$E_{PM2.5}$ = 0.13 (s/1.5) (f/15) lb/day/acre of surface

4 storage piles - No. 2, No.1, No. 1A, screenings

s= silt content (weight %)
f= percentage of time unobstructed wind speed is greater than 12 mph at mean pile height

s= 1.6 (from APR-42 Table 13.2.4-1)
f= 15 (Using 2012 NOAA data, 55 days average speed above 12 mph)

$E_{PM2.5}$ = 0.13 (s/1.5) (f/15) lb/day/acre of surface
0.13 1.07 1

$E_{PM2.5}$ = 0.14 lb/day/acre

Approximate height of storage pile =		25	ft
Approximate base radius of pile =		33.5	ft
Total surface area	=	4399.2	ft^2
	=	0.100992	acres of surface

Emissions	=	0.014	lb/day	5.11	lb/year
Total emissions (4 piles) =				20.45	lb/year
				0.01	**tons/year**

FRONTIER STONE, LLC
DEC ID #8-3436-00033
STORAGE PILES- WIND EROSION- PM-10

E_{PM10} = 0.85 (s/1.5) (f/15) lb/day/acre of surface

4 storage piles - No. 2, No.1, No. 1A, screenings

s= silt content (weight %)
f= percentage of time unobstructed wind speed is greater than 12 mph at mean pile height

s= 1.6 (from APR-42 Table 13.2.4-1)
f= 15 (Using 2012 NOAA data, 55 days average speed above 12 mph)

E_{PM10} =	**0.85**	**(s/1.5)**	**(f/15)**	**lb/day/acre of surface**
=	0.85	1.07	1	

E_{PM10}= 0.91 lb/day/acre

Approximate height of storage pile =		25	ft
Approximate base radius of pile =		33.5	ft
Total surface area	=	4399.2	ft^2
	=	0.100992	acres of surface

Emissions	=	0.09157	lb/day	33.42	lb/year
Total Emissions (4 piles)			=	133.6861	lb/year
				0.07	**ton/year**

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP-42 13.2.4

PM-10 STORAGE PILE-HANDLING

$$E = k(0.0032)\left|\frac{[U/5]^{1.3}}{[M/2]^{1.4}}\right| \text{lb/ton}$$

k = particle size multiplier
U = Mean Wind Speed
M = Material moisture Content %

U=	10	mph	(see NOAA Wind data)
M=	0.7	%	(Table 13.2.4-1)
k=	0.35		(dimensionless)

$$0.00112 \quad \frac{[2.0]^{1.3}}{[.35]^{1.4}}$$

$$0.00112 \quad \frac{2.46}{0.23}$$

0.00112 10.71 **E= 0.011991 lb/ton**
350,000 tons per year 4,196.91 lbs
PM10 **2.10 tons per year**

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM-2.5 Calculation (Loader to Crusher)

$E=k\ (s/12)^a\ (w/3)^b\ x\ [(365-P)/365]$

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) k=1.5 (for PM-10)
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content % **Mean=8.3** for haul road to pit Mean=10 for plant road
W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation
Approximate distance (in feet) from face (muck pile) to primary crusher = 500
Caterpillar 988 loader specifications:
Operating weight = 110,549 lb
Max bucket capacity = 10 yd^3

Conversion factor~ 1.3 tons (limestone) per cubic yard= 13 tons
Rated payload = 12.5 tons (used this figure for calculations)

$.15\ (8.3/12)^{.9}\ x\ (110{,}549+135{,}549/2/2000/3)^{.45}\ x\ (365-160)\ /365$

E= 0.15 $(.692)^{.9}$ x $(20.5)^{.45}$ 205 365
$(13.5)^{.45}$ 0.56
E= 0.15 0.717952 x 3.23 0.195 lbs/vmt (haul roads)

VMT= 350,000 12.5 tons per payload 28,000 trips full 56,000 total trips 28,000,000 ft
28,000 trips empty = 5,303 miles

1034.72 lbs PM-2.5 generated on haul road per year
0.52 tons PM-2.5 generated on haul road per year

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM-10 Calculation (Loader to Crusher)

$E=k\ (s/12)^a\ (w/3)^b\ x\ [(365-P)/365]$

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) **k=1.5 (for PM-10)**
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content % **Mean=8.3 for haul** road to pit Mean=10 for plant road
W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation
Approximate distance (in feet) from face (muck pile) to primary crusher = 500
Caterpillar 988 loader specifications:
Operating weight = 110,549 lb
Max bucket capacity = 10 yd^3

Conversion factor~ 1.3 tons (limestone) per cubic yard= 13 tons
Rated payload = 12.5 tons (used this figure for calculations)

$$1.5\ (8.3/12)^{.9}\ x\ (110{,}549+135{,}549/2/2000/3)^{.45}\ x\ (365-160)\ /365$$

$$E=\ 1.5\ (.692)^{.9}\ x\ \frac{(20.5)^{.45}}{(13.5)^{.45}}\ \frac{205}{0.56}\ \frac{365}{}$$

$$E=\ 1.5\ \ 0.717952\ x\ \ 3.23\ \ 1.95\ \text{lbs/vmt}\ \ \text{(haul roads)}$$

VMT= 350,000 12.5 tons per payload 28,000 trips full 56,000 total trips 28,000,000 ft
28,000 trips empty = 5,303 miles

10347.18 lbs PM-10 generated on haul road per year
5.17 tons PM-10 generated on haul road per year

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM-2.5 Calculation (Plant Road from Sour Springs Road)

E=k (s/12)a (w/3)b (365-P/365)

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) k=1.5 (for PM-10)
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content % Mean=8.3 for haul road to pit Mean=10 for plant road
W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation
Distance of entrance road to stockpiles = 1000 ft
Customer Truck = 28 tons GVW
53 tons with 25 ton payload

$E = 0.15\ (10/12)^{.9} \times (28+53/2/3)^{.45} \times (365-160)\ /365$

$E = 0.15\ (.833)^{.9} \times (40.5/3)^{.45}\ 205\ 365$
$(13.5)^{.45}\ 0.56$

$E = 0.15\ 0.848361 \times 3.225895$ **0.23** lbs/vmt (haul roads)

VMT= 14,000 trips full 28,000 total trips 28,000,000 ft
14,000 trips empty = 5,303 miles

1,222.66 lbs PM-2.5 generated on plant road per year
0.61 tons PM-2.5 generated on plant road per year
305.67 lbs PM-2.5 with 75% control applied

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM-10 Calculation (Plant Road from Sour Springs Road)

$E=k\ (s/12)^a\ (w/3)^b\ (365-P/365)$

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) **k=1.5 (for PM-10)**
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content % Mean=8.3 for haul road to pit Mean=**10** for plant road
W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation
Distance of entrance road to stockpiles = 1000 ft
Customer Truck ≈ 28 tons GVW
53 tons 25 ton payload

Production 350,000 tpy 14,000 trips

E= $1.5\ (10/12)^{.9}$ x $(28+53/2/3)^{.45}$ x (365-160) /365

E= 1.5 $(.833)^{.9}$ x $(40.5/3)^{.45}$ 205 365
$(13.5)^{.45}$ 0.56

E= 1.5 0.848361 x 3.225895 **2.31 lbs/vmt** (plant road)

VMT= 14,000 trips full 28,000 total trips 28,000,000 ft
14,000 trips empty = 5,303 miles

12,227 lbs PM-10 generated on plant road per year
6.11 tons PM-10 generated on plant road per year
3056.66 lbs PM-10 with 75% control applied

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM-2.5 Calculation (Alternate Plant Road to Fletcher Chapel Road)

E=k (s/12)a (w/3)b (365-P/365)

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) k=1.5 (for PM-10)
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content % Mean=8.3 for haul road to pit Mean=**10** for plant road
W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation
Distance of entrance road to stockpiles = 2000 ft
Customer Truck ≈ 28 tons GVW
53 tons with 25 ton payload

E= $0.15\ (10/12)^{.9} \times (28+53/2/3)^{.45} \times (365-160)\ /365$

E= $0.15\ (.833)^{.9} \times (40.5)^{.45}$ 205 365
$(13.5)^{.45}$ 0.56

E= 0.15 0.848361 x 3.225895 **0.231** lbs/vmt (haul roads)

VMT= 14,000 trips full 28,000 total trips 56,000,000 ft
14,000 trips empty = 10,606 miles

2445.328 lbs PM-2.5 generated on alternate plant road per year
1.22 tons PM-2.5 generated on alternate plant road per year
611.33 lbs PM-2.5 generated on alternate plant road per year with 75% control applied

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM 10 Calculation (Alternate Plant Road from Fletcher Chapel Road)

E=k (s/12)a (w/3)b (365-P/365)

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) **k=1.5 (for PM-10)**
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content % Mean=8.3 for haul road to pit Mean=**10** for plant road
W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation
Distance of entrance road to stockpiles = 2000 ft
Customer Truck ≈ 28 tons GVW
53 tons 25 ton payload

Production 350,000 tpy 14,000 trips

E= $1.5\ (10/12)^{.9} \times (28+53/2/3)^{.45} \times (365-160)\ /365$

E= $1.5\ (.833)^{.9} \times (40.5/3)^{.45}$ 205 365
$(13.5)^{.45}$ 0.56

E= 1.5 0.848361 x 3.225895 **2.31 lbs/vmt** (plant road)

VMT= 14,000 trips full 28,000 total trips 56,000,000 ft
14,000 trips empty = 10,606 miles

24,453 lbs PM-10 generated on alternate plant road per year
12.23 tons PM-10 generated on alternate plant road per year
6,113 lbs PM-10 generated on alternate plant road per year with applied 75% control

APPENDIX 3

Revised Portions of TES's Appendix 6

VEGETATION AND WILDLIFE RESOURCES
AND
IMPACT ANALYSIS OF ECOLOGICAL RESOURCES

PROPOSED SHELBY MINE

TOWN OF SHELBY
ORLEANS COUNTY, NEW YORK

Prepared for:

FRONTIER STONE, LLC
4172 East Lake Road
Wilson, New York 14172

Prepared by:

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.
23 County Route 6, Suite A
Phoenix, New York 13135

Revised February 2013
Revised January 2013
July 2011

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1.3.4.5 Mammals

Table 3 lists the species of mammals observed on the Shelby Quarry site. The list primarily includes medium to large-sized animals. There are likely other species of small mammals, such as shrews, moles, voles, and mice that are present on the site, especially in the agricultural and shrub areas.

Woodchucks were abundant in the agricultural cropland and open field areas of the site. They prefer to live along fence rows or heavily vegetated gullies or stream banks. The shrub areas provide this type of habitat. The woodchuck's diet is only herbaceous with a preference for field crops such as clover and alfalfa. Evidence of coyote and white-tailed deer were found in all cover types throughout the site.

1.3.5 Endangered and Threatened and Special Concern Species

The USFWS and the New York Natural Heritage Program (NYNHP) were contacted to obtain records of endangered, threatened, rare, or special concern plants and animals, and significant habitats on or in the vicinity of the site (see Appendix A for correspondence). Literature sources and field surveys were also used to assess the site for listed species.

1.3.5.1 Plants

The USFWS letter (Appendix A) indicated that no federally-listed or proposed endangered or threatened plant species under their jurisdiction are known to exist on site in the project vicinity.

The NYNHP had no records of known occurrences of state-listed plants, significant natural communities, or significant habitats on or in the vicinity of the site.

No endangered, threatened, or rare plant species or communities were noted by TES during the field surveys of the site.

1.3.5.2 Wildlife

~~Six~~ Seven listed bird species are known from the vicinity of the project site. Short-eared owl is an endangered species. Bald eagle, northern harrier, and Henslow's sparrow are threatened species. Osprey, Horned lark, and Cerulean Warbler are special concern species. Short-eared owl was specifically mentioned by the NYNHP. Some of the species identified during the bird surveys (e.g., wood thrush, blue-winged warbler, hooded warbler) are on the Partners in Flight (PIF) Species of Continental Importance list. This list includes species that the PIF identified as having "the greatest range-wide concern and which are in most need of conservation attention." One of the main purposes of PIF is to "keep common birds common" (USFWS 2010). Neither the wood thrush, hooded warbler, or blue-winged warbler is a state-listed endangered, threatened, or special concern species. The wood thrush has a continent-wide population of 14,000,000 birds and concern for this species occurs primarily in its wintering habitats. Hooded warbler is on the "additional stewardship species" list whose population trends are stable or unknown and are not currently threatened. Blue-winged warbler is listed due to low population size. Blue-winged warbler hybridizes with golden-winged warblers. This tendency

poses one of the greatest threats to golden-winged warbler viability. The proposed quarry is not expected to affect these three species.

Bald Eagle

The USFWS indicated the potential for bald eagle (*Haliaeetus leucocephalus*) to occur within the proposed project area because it was observed nesting approximately 4 miles from the proposed project area at the INWR. Bald eagle is a state-listed threatened species. Bald eagle was delisted by the USFWS, but it is still a protected species. In comments dated March 1, 2012, the INWR reports that there are a total of four known bald eagle nest sites within the INWR and the adjoining Oak Orchard and Tonawanda Wildlife Management Areas.

Bald eagles range over almost all of North America, from Alaska and Canada down into northern Mexico (USFWS 2006). They have greatly expanded their presence in New York State since the NYSDEC eagle restoration program. According to the NYSDEC, occupied nesting pairs numbered 145 in 2008 with 134 breeding pairs (Nye 2008). The bald eagle has been delisted from the Endangered Species Act due to the recovery of this species.

The following summarizes important habitat components for the species. This information was obtained from the USFWS website. Bald eagles live 15 to 25 years in the wild and usually mate for life. Large nests, often 4 to 6 feet wide and up to 1,000 pounds, are generally built in the tops of large trees near rivers, lakes, or marshes. The main diet of bald eagles is fish. They will also feed on waterfowl, rabbits, turtles, and other small animals. In the winter, they gather near open water where fish and waterfowl are abundant.

Bald eagles prefer an environment of tall, mature trees, clean water, and quiet solitude for nesting (USFWS 2006). The majority of the site is agricultural and is treeless, with no large open waterbodies. Therefore, no potential nesting habitat for bald eagle exists on the proposed Shelby quarry site.

There is little mature forested habitat in the immediate vicinity of the site. Other surrounding land uses are largely agricultural or residential. The forested areas south of the site on the INWR are young second-growth stands that presently do not contain any super canopy trees that are preferred nesting locations for bald eagles. Center Marsh is the nearest impoundment to the proposed quarry site, although water levels are manipulated by the USFWS, Center Marsh did not always contain water during our study period. Without water this area does not provide optimum eagle nesting habitat. Center Marsh might provide nesting bald eagle habitat in the future when the trees grow larger. However, even if future nesting habitat developed, operation of the quarry would not affect the establishment of an eagle nest at Center Marsh. The areas of potential future nest locations at Center Marsh are more than 1,500 feet from the southern quarry boundary.

Cerulean Warbler

The cerulean warbler (*Dendroica cerulea*) is a species of special concern by the NYSDEC. Cerulean warbler declines are linked to declines in wintering habitats. No cerulean warblers were recorded on the proposed quarry site or in the INWR immediately south of the

northern harrier in the vicinity of the project site. A regional land use map that was prepared by the USFWS is provided, and it shows extensive open field and agricultural areas in the nearby vicinity for foraging northern harriers (Figure 10).

TES observed northern harriers on three occasions, two occurrences were outside the breeding season. Due to the intensive agricultural nature of the site, northern harriers would utilize off-site areas for breeding where they would not be disturbed by agricultural practices. In 2010, a female northern harrier was recorded flying and foraging on the site. Nesting habitat does not exist for northern harrier on the site.

Horned Lark

Horned larks (*Eremophila alpestris*) were present in the cropland areas on the site. This species is listed by the State of New York as a species of Special Concern. On April 29, 2010 this species was recorded and are nesting on the site. The species occurs in open areas with bare ground or short grass. Despite being listed as Special Concern, horned larks are a "fairly common breeder locally in western and central New York..." (Andrle and Carroll 1988).

Henslow's Sparrow

No Henslow's sparrow (*Ammodramus henslowii*) was recorded on the site or in the INWR immediately south of the site. Successional open field habitat required for nesting was not present. The closest nesting record for this species was ¾ mile west from the site recorded in 2001 (Roster 2008).

Osprey

Osprey (*Pandion haliaetus*) is a special concern species in New York State. TES observed one osprey fly over the site on July 13, 2010 and one was recorded on the INWR during the 2012 breeding bird survey. The diet of the osprey is primarily fish. There are no open water ponds on Shelby Quarry site for osprey to feed and no on-site nesting habitat.

1.4 SUMMARY

Terrestrial Environmental Specialists, Inc. (TES) was contracted by Continental Placer Inc. to perform biological surveys of the 268-acre Shelby Quarry site located in the Town of Shelby, Orleans County, New York. The surveys included assessments of common plants and animals, upland and wetland cover types, and endangered and threatened species. Descriptions of the characteristic plants and animals of each cover type on the site are provided. Contacts were made to state and federal agencies for listed species and field searches of the site were performed by TES botanists and wildlife biologists.

About 267 acres or 99 percent of the site is upland, nearly all of which is agricultural cropland. Open fields and scrub-shrub uplands occur in small sections throughout the site.

No state-regulated wetlands are mapped on or near the site. Three agricultural ditches totaling approximately 0.7 acre or 0.3% of the site were delineated. These ditches drain uplands.

essential habitat for the Henslow's sparrow on the project site. No adverse modification of Henslow's sparrow habitat will occur from the quarry development.

2.3.6. Cerulean Warbler

The cerulean warbler is a species of special concern by the NYSDEC. No cerulean warblers were recorded on the proposed quarry site or in the INWR immediately south of the site. There is no essential habitat for the Cerulean Warbler on the project site. No adverse modification of Cerulean Warbler habitat will occur from the quarry development.

2.3.7 Osprey

The osprey is listed as a species of special concern by the NYSDEC. Osprey is a known breeder on the INWR. There is no essential habitat for the osprey on the proposed quarry site. No adverse modification of habitat will occur from quarry development.

2.4 PROPOSED MITIGATION MEASURES

Best management practices, such as erosion and sediment control, and a stormwater management plan are proposed as part of the plans. Areas developed as berms from overburden material will be seeded and restored. These practices will help minimize impacts.

As previously discussed, the proposed quarry will be developed in phases over an expected life of 75 years. Phases that are not to be developed until future years will remain in agricultural use. This approach will minimize impacts over time.

Three farm ditches occur on the site. The three ditches on site total approximately 0.7 acre, and are agricultural drainage ditches draining only upland areas, such as the airport runway and agricultural fields, and do not carry a permanent flow of water. A jurisdictional determination was issued by the Buffalo District of the Corps on July 20, 2011.

A reclamation plan is proposed for the quarry. The plan basically involves developing the quarry areas into lakes after the mining is complete. The lakes will be fairly deep, but will include a 50-foot perimeter of shallow water less than 5 feet deep. The lakes will provide habitat for fauna, especially waterfowl. Portions of the shallow fringe will develop into a wetland area. If the entire 50-foot perimeter shallow develops into a wetland, it will represent approximately 18 acres.

2.5 INDIRECT AND OPERATION IMPACTS TO ECOLOGICAL RESOURCES

Indirect and operational impacts to ecological resources can include changes in faunal use of adjacent habitat because of removal of habitats on site and noise/activity (including blasting) from the project. Alterations in surface water by a project can also affect adjacent communities in certain circumstances.

The Shelby site is essentially all agricultural cropland habitat. Standard agricultural activities, such as plowing, planting, herbicide/pesticide application, and harvesting, occur in these areas on a regular basis. The site is located just north of the INWR. An overhead electric

INWR survey point #8 (Figure 13). Henslow's sparrows have demonstrated the ability to adjust to noise and vibrations. For example, one of the largest populations of Henslow's sparrows in New York State occurs on Ft. Drum in proximity to live fire training activities (Krebs 2002).

Disturbance by sounds from the operating quarry will be minimal in comparison to bomb blasts and gunfire on active military ranges. Blasting will occur once or perhaps twice per week. Vibrations from the blasting would be felt 1,200 feet into INWR. This is an insignificant impact. Other quarry sounds will be limited in their dispersion distance. As shown in the studies cited in this report, animals have the ability to habituate to loud noises. Based on noise measurements by Continental Placer the mining noises reduce to the current ambient noise level within 350 feet of the INWR boundary. Air blast noise will attenuate at a distance of 500 feet in the INWR. Noise from blasting is similar to a clap of thunder and lasts less than a second in duration. As a result, noise from the quarry would not affect resident or migrating wildlife on INWR.

Buffering can also be accomplished using vegetation and by creating berms. To mitigate potential noise impacts, the applicant plans to construct berms 30-50 feet in height (Figure 18 in the Draft Environmental Impact Statement). Construction of the berm occurs during the first phase of quarry development and is a temporary impact likely limited to the first year of quarry work. The construction of the berm is designed to minimize off-site noise impacts. These berms will limit the extent to which both noise and vibration dissipate into the surrounding area.

The applicant also proposes to minimize the effects of blasting by following USBM guidelines, optimizing efficiency of blasts such that the majority of energy from the blast will break the rock, with a minimal amount of energy being dissipated into the surrounding areas. Noise and vibration will also be minimized by using timing delays to sequence the blasting. Blasting is going to occur during the middle of the day when ambient noise is greatest and on days when cloud cover is limited so that reflection of blast noise is limited.

2.8 TRUCK TRAFFIC

Truck traffic will exit from the site south onto Sour Spring Road and then proceed west onto Oak Orchard Ridge Road. Truck traffic will then turn south onto State Highway 63, which bisects the refuge. The Frontier Stone Quarry is anticipated to generate approximately 30 one way trips per hour with eight to ten trucks entering and exiting the site during the peak hours, based on 220 working days per year, 8-hour shift day, and an average truck capacity of 25 tons. Under a "worst case" scenario, it would generate approximately 30 truck trips per hour. Fletcher Chapel Road has been identified as an alternative for site access.

One of the most cited scientific papers related to vehicular traffic and effects on breeding birds is Reijnen R. *et al.* (1995). This study, conducted in the Netherlands, found reductions in breeding density in deciduous and conifer forests next to roads due to noise. However, the traffic volumes examined were 10,000 cars per day and 60,000 cars per day. Based upon this study, the proposed increase in traffic volumes along the proposed Sour Spring Road access, or the identified Fletcher Chapel Road alternative, would not cause significant noise disturbance to breeding birds. The threshold for disturbance has been established by the current road traffic and since volumes will not increase significantly, there should be no effect on wildlife.

Impacts to wildlife crossing these roads should be minor as the increase in traffic is minimal. In addition, it should be noted that the roadway is on the fringe of the Refuge for only

2.10 SUMMARY

Impacts to ecological resources were assessed within this chapter. The site of the proposed quarry consists of active agricultural uses. This farm has been in operation for over 50 years by the current landowner. There will be a reduction in agricultural habitat from development of the quarry. This will reduce available habitat for species such as horned lark, killdeer, and Savannah sparrow.

There are no endangered or threatened wildlife species nesting on the site. The horned lark, a special concern species, is a known nester. Northern harriers were noted foraging over the site. Development of this site would not cause an adverse impact to northern harriers as they are known to forage over hundreds of acres. Short-eared owls are known to occupy a winter roost over one mile from the site. The quarry operation will not be active in the winter when these birds are present. Short-eared owls are known to use quarries for foraging opportunities. No adverse impact to short-eared owls will occur.

Indirect impacts to off-site resources is expected to be minor. Background information related to noise and blasting was provided. Blasting will occur once or twice a week. . Air blast noise will attenuate at a distance of 500 feet in the INWR. Noise from blasting is similar to a clap of thunder and lasts less than a second in duration. Noise and vibration will be dissipated by a berm on the perimeter of the quarry and by the distance from the operation. Sounds generated by the quarry will reduce to the current ambient background noise within 350 feet of the INWR border and 1,000 feet for vibrations. No effect will occur to Henslow's sparrows which nested approximately 4,000 feet west of the proposed quarry.

The proposed project truck traffic volumes will be minimal when compared to existing traffic on Route 63 which bisects the Refuge and carries 3,700 vehicles per day. The proposed increase in traffic volumes along the proposed Sour Spring Road access, or the identified Fletcher Chapel Road alternative, would not cause significant noise disturbance to breeding birds. The threshold for disturbance has been established by the current road traffic and since volumes will not increase significantly, there should be no effect on wildlife.

Dust is regulated by the NYSDEC and control measures are strictly enforced based on Air Facility Restriction Certificate. Good operating practices will be employed to control fugitive dust emissions.