July 16, 2010

Mr. Tyler Bintrim
U.S. Army Corps of Engineers, Regulatory Branch
1834 Federal Office Building, 1000 Liberty Avenue
Pittsburgh, PA 15222

RE: Glacial Sand and Gravel Co. – Mine 47 - SMP
Worth Township, Butler County
Article I. Section 404 Permit Application

Dear Mr. Bintrim:

Based on comments received from the U.S Army Corps of Engineers (Corps) and private citizens in correspondence from your office dated June 17, 2010, the EADS Group, Inc. (EADS) submits the following response to several questions posed regarding the permit application previously submitted for the proposed Mine 47 site in Butler County, PA.

A majority of questions received were related to the necessity of the water processing ponds proposed to impact Wetland #2. The following discussion will explain the critical role of these ponds to assuring that the project, as defined by the applicant (a sand and gravel mine with an associated sand and gravel processing facility) is and why there is no practical alternative to the location of these proposed ponds within Wetland #2, and to provide further justification for proposed impacts to Wetland #2.

As recognized by the Corps, **temporary** processing ponds have been constructed in uplands at the nearby Mine 31 site to receive water from the processing facility which has been constructed adjacent to the Mine 47 site. Glacial Sand and Gravel Company (Glacial) constructed these ponds strictly as a temporary measure to enable it to bring its newly constructed processing facility on-line to meet market demand in anticipation of receiving permits from the Corps and PA Department of Environmental Protection (DEP) to construct properly-sized water processing ponds in the location proposed in the pending application.

The ponds installed at Mine 31 were never intended for long-term use and for a variety of reasons cannot be used longterm to service Glacial's processing facility (and, ultimately its Mine 47 production facility):

- Because the ponds were intended to be temporary in nature and are located over existing sand and gravel reserves, they are severely undersized at approximately 64,000 cubic foot capacity versus the proposed and intended design of 390,000 cubic foot ponds, which will impact Wetland # 2. When sand and gravel is processed there is a wash loss of 60 tons per hour which, with an 8 hour a day operation, causes these temporary ponds to fill every 7-10 days. Maintenance and cleaning of these ponds at this rate is a weekly requirement which is causing an interruption of the processing operation which cannot continue over the course of the entire project without resulting in its purpose (the

☐ 1126 Eighth Avenue Altoona, PA 16602 (814) 944-5035 (814) 944-4862 Fax
■ 15392 Route 322 Clarion, PA 16214 (814) 764-5050 (814) 764-5055 Fax
☐ 227 Franklin St., Suite 208 Johnstown, PA 15901 (814) 535-5388 (814) 535-7654 Fax
☐ 450 Aberdeen Drive Somerset, PA 15501 (814) 445-6551 (814) 443-2748 Fax
☐ 11045 Parker Drive North Huntingdon, PA 15642 (412) 754-0801 (412) 754-0860 Fax
☐ 81 Baltimore St., Suite 600 Cumberland, MD 21502 (301) 777-7878 (301) 777-8391 Fax

operation of a sand and gravel operation which returns a reasonable return on investment while complying with applicable requirements relating to the project) being completely frustrated. As we have emphasized, in the past, the temporary ponds were only intended to provide "stop-gap" means to enable the newly constructed processing facility to operate until regulatory permits could be secured to construct adequately-sized ponds at the adjoining Mine 47 production site.

- The temporary ponds located on Mine 31 also had to be located over marketable sand and gravel reserves. Mine 31 is currently being mined from the northern boundary in a southerly direction, and it is estimated that the active mine face will reach the temporary ponds in approximately one year, necessitating their removal well in advance of that date.
- Maintaining the temporary ponds during active mining at Mine 31 will also create huge operational inefficiencies if a large central portion of that mine has to be avoided and safe slopes from the temporary ponds maintained to the bottom of the pit floor. It is also important to note that unlike coal mines or limestone quarries that primarily contain homogenous reserves, sand and gravel quarries are largely comprised of heterogeneous reserves. The most marketable material at any given time is often concentrated in a portion of the mine site, thus sterilizing the reserves under the temporary ponds could well mean that Glacial would have to mine material with a lower concentration of marketable material. As a result, Glacial may not be able to meet market demands and stockpiles of less marketable material will grow at a rapid rate.
- Due to existing topography, the process water from newly constructed processing facility is currently being pumped via a pipeline to the Mine 31 temporary ponds. After sediment is removed, this water has to again be pumped back to the processing plant. Pumping water both directions is not only inefficient and wasteful of energy it adds unnecessarily to processing costs. In addition, the temporary pipeline is also above marketable sand and gravel reserves and will also have to be removed before mining progression can continue as initially planned and projected for Mine 31.

The Corps has inquired as to the feasibility of using the temporary Mine 31 ponds until the mine pit is exposed at Mine 47, so that, once exposed, this pit can be utilized for washing the aggregate material. This scenario is also not practical due to the timeframes of mine operations at both Mine 31 and Mine 47 and the inherent problems that are associated with water processing within an active mine pit.

- Using an active mine pit at Mine 47 (or Mine 31) for water processing is not practical because the process water carries a large percentage of silty waste material (15-20%) that will contaminate the clean reserves below. If process water is introduced to the mine pit, the waste material will have to be removed from the reserves a second and subsequent times as the process water circulates through the plant. This is extremely inefficient and hard on processing equipment, and will create unnecessary maintenance problems. Furthermore, the reduced percentage of marketable material recovered would soon render the operation impracticable. In addition, the proposed 19-acre pit area at Mine 47 is relatively small, and does not allow sufficient space to segregate the working pit from a pit sump area.

- The proposed Mine 47 pit area adjacent to the processing plant currently contains approximately 3.5 million tons of reserves. Based on historical production rates at the retired Elliott Plant, Glacial estimates that production rates at Mine 47 will range from 400,000 – 550,000 tons/year. This means that once mining commences at Mine 47, it would take approximately 6-9 years before mining would be completed and the pit area could be utilized for water processing. This estimate assumes that all marketable material for the processing plant is obtained from Mine 47. However, since no permit has yet been issued for Mine 47 it would be difficult to predict when mining could begin at Mine 47 and, therefore, by what point in the future the pit size on this site would be available for use by the adjoining processing plant.
- Similarly, the Mine 31 pit area currently contains approximately 9.2 million tons of remaining reserves that will be mined at an estimated rate of 400,000-550,000 tons/year. This means that it would take approximately 17-23 years before mining would be complete and this area could be utilized for water processing. This estimate assumes that all marketable material for the processing plant is obtained from Mine 31. Understanding that the Mine 31 site is significantly larger (84 acres) than Mine 47 (19 acres) (a situation created because Glacial has, to the extent practicable, sought to avoid impacts to wetlands), it may be possible to segregate a worked out area of Mine 31, after half of the reserve is mined. However, that would still mean it would be at least 9-12 years before a separate pit sump area on Mine 31 would be available. Process water would still have to be pumped both to and from Mine 47 under this scenario, which is undesirable due to the information provided above.
- It should also be noted that when mining commences at Mine 47, it will be performed concurrently with mining at Mine 31. The estimated production rate of 400,000-550,000 tons/year represents total production at the processing plant, regardless of whether material is obtained from one or both mines. This means that the previously calculated lifespan estimates of both mines represent minimum timeframes. Reserves will be mined proportionately to market demands, which are difficult to predict. For example, if 50% of marketable material is obtained from Mine 47 and 50% from Mine 31, the lifespans of each mine will double compared to the minimum estimates.

The following table is provided to help clarify the mining timeline for both Mine 31 and 47. The timeline is of course subject to known conditions and market at this time.

	Mine 31	**Mine 47 (South of West Liberty Road)**
Approximate Acreage	84.4	19.2
Estimated Reserves (tons)	8,900,000	3,500,000
Estimated Production Rate (tons/yr)*	400,000-550,000	400,000-550,000
Estimated Minimum Lifespan (yrs)	17-23	6-9
Estimated Use of Temporary Process Ponds	Present – Aug 2011	N/A
Estimated Use of Ponds 1-4	N/A	August 2011-2018
Estimated Use of Mine Pit for Processing	2019 and beyond	2017 and beyond

*This value represents total production from the processing plant that will receive sand and gravel from both Mine 31 and Mine 47.

Because a significant portion of mining will not be completed at either the Mine 47 or 31 mine pit for approximately 6-9 years, water processing ponds must be constructed at the Mine 47 site in the near future to continue operation of the processing plant. As discussed above, these ponds must be located on areas that are not above marketable reserves. In addition, the processing ponds need to be located down-gradient of the processing plant so that water only has to be pumped one way during processing. These site constraints are some of the practical reasons why Ponds 1-4 are proposed to be located in the area of Wetland #2.

The Corps also inquired about the status of the Eastern Massassauga Rattlesnake (*Sistrurus catenatus catenatus*) surveys that have been completed at the site. EADS previously provided a report (dated May-June 2008) that described a massassauga study performed at the site by Tetra Tech, Inc. At the request of the PA Fish and Boat Commission (PFBC), Glacial contracted Tetra Tech Inc. to complete additional surveys for the massassauga in 2010. Survey methods were approved by Ms. Kathy Gipe of the PFBC (see attached correspondence – Appendix E). The latest surveys were conducted by Tetra Tech on May 16, 24, 25, 26, 27 and June 2 and 3, 2010. The results of these additional surveys are included in a report (dated July 2010) that is attached to this letter. Tetra Tech did not document the presence or any other physical evidence of massassauga rattlesnakes and concluded, "mining and related activities within the proposed Mine No. 47 survey area should not have an adverse impact on the eastern massassauga rattlesnake."

The Corps has requested that Glacial respond directly to two private citizens based on comment letters they submitted. As we discussed in our phone conversation on July 15, 2010, Glacial respectfully declines to engage in direct correspondence with the public and appreciates the Corps forwarding any application materials to these individuals that may be of interest to them.

If you have any questions or require additional information, please contact our office.

Sincerely,

The EADS Group, Inc.

Richard G. Tote, PLS
Project Manager

Enclosures

Cc: Christopher Yeakle, Bureau of Mining and Reclamation
Jeff Lapp, U.S. Environmental Protection Agency
Steve Kepler, PA Fish and Boat Commission

GLACIAL SAND AND GRAVEL COMPANY- PROPOSED MINE #47 PROJECT (SIR# 33499)

SURVEY RESULTS FOR EASTERN MASSASAUGA RATTLESNAKE (*SISTRURUS C. CATENATUS*) AT PROPOSED MINE #47, BUTLER COUNTY, PENNSYLVANIA

APRIL – JUNE 2008

MAY – JUNE 2010

TETRA TECH

Prepared by
Tetra Tech, Inc.
Portland, Maine

For
Glacial Sand and Gravel Company
Kittanning, Pennsylvania

July 2010

TETRA TECH

MINE #47 EASTERN MASSASAUGA RATTLESNAKE (SISTRURUS C. CATENATUS) SURVEY REPORT SIR# 33499

TOWN OF SLIPPERY ROCK, BUTLER COUNTY, PENNSYLVANIA

Prepared for:

Glacial Sand and Gravel Company
Kittanning, PA

Submitted by:

Tetra Tech, Inc.
451 Presumpscot Street
Portland, ME 04103

July 2010

TABLE OF CONTENTS

SECTION PAGE

1.0 INTRODUCTION 1
1.1 SITE DESCRIPTION 1
2.0 METHODS 2
2.1 SURVEY PERIOD 2
2.2 SURVEY METHODS 3
3.0 Results 5
4.0 Conclusion 7

LIST OF APPENDICES

APPENDIX

Appendix A Figures
Appendix B Photographic Record
Appendix C Field Notes
Appendix D PFBC Approved Survey Options
Appendix E Agency Email Correspondence
Appendix F Scientific Collector's Permit
Appendix G Literature Cited

LIST OF TABLES

TABLE

Table 1. Survey Dates and Times for the Eastern Massasauga Rattlesnake Surveys at Mine #47, Slippery Rock, Pennsylvania. 3

Table 2. Herpetofaunal Observations during the Eastern Massasauga Rattlesnake Surveys at Mine #47, Slippery Rock, Pennsylvania. 6

1.0 INTRODUCTION

The eastern massasauga rattlesnake (*Sistrurus c. catenatus*) is listed by the Pennsylvania Fish and Boat Commission (PFBC) as endangered in the State of Pennsylvania. The eastern massasauga rattlesnake is documented as occurring at Jennings Environmental Education Center within four (4) miles of the proposed Mine #47 site; however, historic documentation or information confirming the presence of the eastern massasauga rattlesnake within the boundary of the proposed Mine #47 site is not available.

At the landscape level, massasauga are known to be found in habitats ranging from wet prairies, fens and sedge meadows to old open fields and adjacent forests. In many instances, massasauga show seasonal shifts in habitat use. Typically they can be found in wet prairie and meadow habitats in spring and fall, and in drier upland field or open wooded habitats in summer (Johnson et al. 2000).

More specifically, massasauga habitat consists of a complex of structural and vegetation features that provide opportunities for three key requisites: foraging, basking and overwintering. As their principal prey is rodents which they locate by olfactory means and then adopt a sit-and-wait strategy, adult massasaugas may be found wherever rodents occur. Basking opportunity is important for the thermoregulatory demands of digestion and ecdysis (shedding) for all individuals and is particularly critical for gestation by gravid females. Basking sites consist of areas exposed to the sun that also provide cover from predators. Overwintering sites are important components of massasauga habitat. These sites consist of situations where individual snakes can avoid lethal freezing temperatures and typically contain liquid water. Crayfish burrows, root mats of wetland trees and shrubs, and vegetated hummocks in peatlands are examples. In western Pennsylvania and across most of the Midwestern United States, crayfish burrows are the principal overwintering site.

1.1 SITE DESCRIPTION

The study area is located at 1050 West Liberty Road, in the town of Slippery Rock, Butler County, Pennsylvania. Mining activities will involve the excavation and removal of a small portion of the southeastern section of Miller Esker. The proposed mine area was surveyed and determined to contain two areas of potential massasauga habitat (PMH): PMH 1 is located north of West Liberty Road and east of Swope Road, and PMH 2 is located south of West Liberty Road, between Mt. Union Road and Moore Road (Appendix A). PMH 1 and PMH 2 are separated by West Liberty road and a south facing slope consisting of grass/forbs and scrub/shrub habitat. An intermittent stream flows west along the south side of West Liberty Road, adjacent to PMH 2. PMH 1 and PMH 2 are hydrologically disjoint.

PMH 1 is approximately 2.0 acres, and consists of maintained grass/forbs dominated uplands and shrub/willow wetland habitat. The primary source of hydrology for the wetlands at PMH 1 is a glacially carved "kettle" and relict beaver pond created by damming the inlet of Tamarack Lake in the vicinity of Swope Road. The actual beaver "dam" is located northwest of the project area on an adjacent property. During the 2008 survey, wetland hydrology was maintained by the presence of this beaver pond and a resident beaver population. At the time of the 2010 surveys,

the beaver dam in the vicinity of Swope Road had been removed by the property owner, and subsequent hydrology appeared to be reduced in portions of the survey area. It was also noted that fewer crayfish burrows were present within the survey area during the 2010 Survey Period.

PMH 2 is approximately 4.5 acres, and is dominated by cultivated grasses and palustrine emergent wetlands. The wetlands appear to be depressional drainage swales and low lying areas characterized by emergent sedges and rushes. The primary sources of hydrology for this portion of the survey area are likely seeps and springs associated with the surrounding uplands. Few chimney crayfish burrows were present during the 2008 and 2010 survey periods.

A portion of PMH 2 that was surveyed in 2008 was removed from the 2010 survey effort due to the construction of an access road and presence of a new gravel and sand sorting facility. The access road and sorting facility were built following an approved permit. The access road was placed within PMH 2 on an upland lobe between two palustrine emergent wetlands within PMH 2. The facility was placed on the north facing slope immediately adjacent to the south of PMH 2 (see Appendix B, Photographic Record). Pursuant to an approved permit, a stormwater retention pond was constructed adjacent to the southwest corner, just outside the boundary of PMH 2. Discharge from the stormwater retention pond is directed into the wetlands associated with PMH 2 prior to entering the intermittent stream flowing west along West Liberty Road.

Construction was not occurring at the time of the 2010 surveys. However, construction related materials, such as wood debris and silt fence, were found throughout the survey areas. These types of materials provide excellent cover for several reptile and amphibian species, and were investigated for the presence of the eastern massasauga rattlesnake.

2.0 METHODS

2.1 SURVEY PERIOD

Eastern massasauga rattlesnake activity is variable dependent on weather conditions. According to Casper et al (2000) in their *Recommended standard survey protocol for the eastern massasauga (Sistrurus c. catenatus)*, it is best to perform visual searches under weather conditions with at least 50% cloud cover, wind speed less than 15 mph, and temperatures between 50 and 80 degrees Fahrenheit. Surveys should be carried out in the morning and evening when eastern massasauga rattlesnakes are typically in open basking locations. The most productive survey periods tend to be during spring emergence and mid-summer when gravid females are seeking out open basking sites (Casper et al. 2000).

The surveys generally followed the guidelines set forth by the PFBC in the *Guidelines for Eastern Massasauga Rattlesnake Surveys* (2005) to determine presence or absence. These guidelines state that visual encounter surveys for the eastern massasauga rattlesnake should be performed during the spring emergence period of April 15 to June 15. During this time of year, eastern massasauga rattlesnakes are known to remain close to the hibernaculum (overwintering site) while foraging and preparing to breed. Surveys of PMH 1 and PMH 2 were carried out during this spring emergence period, during 2008 and 2010, as noted in Table 1. Surveys generally occurred between 07:30 and 18:45 hours.

During the 2010 survey period PMH 1 and PMH 2 were surveyed together as one 6.5 acre parcel, with surveys focused more intensively on areas with the greatest potential for harbouring the eastern massasauga rattlesnake. The study area includes all areas that meet the criteria needed to provide foraging, basking, or overwintering habitat for the eastern massasauga rattlesnake.

Table 1. Survey Dates and Times for the Eastern Massasauga Rattlesnake Surveys at Mine #47, Slippery Rock, Pennsylvania.

Survey #	Date	Time	Surveyors	Person Hours
2008 Survey Period				
1	April 26, 2008	08:15 - 10:30	G. Johnson, J. Sweitzer	4.5
2	May 10, 2008	09:00 - 12:30	G. Johnson, J. Sweitzer	7.0
3	May 24, 2008	08:50 - 12:30	G. Johnson, J. Sweitzer	7.0
4	June 9, 2008	08:00 - 11:30	G. Johnson, J. Sweitzer	7.0
2010 Survey Period				
1	May 16, 2010	10:30 - 17:30	G. Johnson, J. Sweitzer, S. Haugh, N. Finch	28.0
2	May 24, 2010	14:45 - 18:45	G. Johnson, J. Sweitzer, N. Finch	12.0
	May 25, 2010	08:30 - 12:00 12:30 - 16:00	G. Johnson, J. Sweitzer, S. Haugh, N. Finch	28.0
3	May 26, 2010	07:30 - 10:30	G. Johnson, J. Sweitzer, S. Haugh, N. Finch	12.0
	May 27, 2010	07:30 - 12:00 12:30 - 15:00	G. Johnson, J. Sweitzer, S. Haugh, N. Finch	28.0
4	June 02, 2010	07:30 - 12:00 12:30 - 15:30 16:30 - 18:00	G. Johnson, J. Sweitzer, S. Haugh, N. Finch	36.0
	June 03, 2010	07:30 - 09:30	G. Johnson, J. Sweitzer, S. Haugh, N. Finch	8.0
Total Person Hours				177.5
Total Person Hours/Acre				27.3

2.2 SURVEY METHODS

In accordance with the PFBC guidelines, Tetra Tech, Inc. (TT) conducted a habitat assessment and presence - absence surveys for the eastern massasauga rattlesnake of the proposed location of Glacial Sand and Gravel Company's Mine #47. The habitat assessment was conducted on April 26, 2008, and consisted of a site walk-over and visual inspections for key structural and vegetative features that are often used by massasauga for foraging, basking and overwintering. The site was determined to contain each of the three key requisites of massasauga habitat and visual encounter surveys were conducted between April 26 and June 9, 2008, and between May 16 and June 3, 2010.

Prior to the beginning of surveys, a Scientific Collector's Permit (Permit # 349 Type 3) valid for eastern massasauga rattlesnakes was obtained from the PFBC by Dr. Glenn Johnson, a PFBC-recognized eastern massasauga rattlesnake surveyor. During all survey work onsite, the permit was in Dr. Glenn Johnson's possession. A copy of the issued permit is located in Appendix F of

this report. Copies of fishing licenses that are required to obtain the Scientific Collector's Permit are also included in Appendix F.

The 2008 surveys were performed by Dr. Glenn Johnson (Permit Owner) and associate biologist Justin Sweitzer (Approved Assistant). The 2010 surveys were performed by Dr. Glenn Johnson (Permit Owner), and approved assistants, associate biologist Justin Sweitzer, environmental scientist Sarah Haugh, and environmental scientist Nikki Finch.

The PFBC recommends conducting both visual encounter surveys and cover board surveys. The recommended survey window for visual encounter surveys is between April 15 and June 15; the recommended survey window for cover board surveys is between June 1 and October 10. Visual encounter surveys should be conducted when air or wet soil temperatures are above 60°F. To meet the PFBC criteria, a minimum of four visual encounter surveys of 3–6 person hours per acre of suitable habitat should be conducted per site visit.

Four visual encounter surveys and no cover board surveys were conducted in 2008. Following an email correspondence with Ms. Kathy Gipe of the PFBC (Appendix E), dated April 8, 2010, an increased effort in visual encounter surveys with no cover board surveys (Appendix D) was determined to satisfy the PFBC survey criteria; and with the approval of the PFBC, TT performed four additional visual encounter surveys during the recommended survey window in 2010.

A total of eight visual encounter surveys were conducted within the recommended survey window between the 2008 and 2010 survey periods. Actual survey dates occurred between April 26 and June 9, 2008; and, May 16 and June 03, 2010 (Table 1). At the onset of each survey, data such as time, air temperature, ground temperature, average wind speed, and current weather conditions were collected to establish that baseline weather condition criteria were met, as set forth by the PFBC.

Additional information collected during the surveys included notation of the presence of other reptiles, amphibians, and small mammals, and any other noteworthy wildlife. This information was used to establish an understanding of the potential prey base for the eastern massasauga rattlesnake, as well as provide evidence that the weather conditions were favorable for reptile and amphibian observations.

3.0 RESULTS

Visual encounter surveys performed during the 2008 and 2010 survey periods did not identify the presence of the eastern massasauga rattlesnake within the Glacial Sand and Gravel Company's proposed location for Mine #47.

Herpetofauna encountered during the survey periods include eastern garter snake (*Thamnophis s. sirtalis)*, eastern ribbon snake (*Thamnophis s. sauritus)*, northern water snake (*Nerodia sipedon)*, American toad (*Anaxyrus americanus)*, green frog (*Lithobates clamitans)*, gray treefrog *(Hyla versicolor)*, pickerel frog *(Rana palustris)*, spring peeper (*Pseudacris crucifer)*, eastern red-backed salamander *(Plethedon cinereus)*, and painted turtle *(Chrysemys picta)*. Reptiles and amphibians observed within the survey area are included in Table 2.

Table 2. Herpetofaunal Observations during the Eastern Massasauga Rattlesnake Surveys at Mine #47, Slippery Rock, Pennsylvania.

Date	Location	Species
2008 Survey Period		
April 26, 2008	PMH 2	eastern garter snake (p)*
	PMH 1	gray tree frog (v)
		American toad (v)
May 10, 2008	N/A	None
May 24, 2008	N/A	None
June 9, 2008	PMH 1 and PMH 2	gray tree frog (v)
2010 Survey Period		
May 16, 2010	PMH 2	gray tree frog (v)
		(7)** eastern garter snake (s) (h)
		(1) pickerel frog (s)
		(numerous) green frog (s)
		eastern ribbon snake (p)
		(3) eastern garter snake (s)
	PMH 1	eastern garter snake (s)
		(2) green frog (s)
May 24, 2010	PMH 1	(3) eastern garter snake (s)
		(numerous) gray tree frog
		(2) eastern red-backed salamander (s)
May 25, 2010	PMH 2	(7) eastern garter snake (s)
		American toad (h)
		(numerous) green frog (s)
May 26, 2010	PMH 1	eastern garter snake (s)
		northern water snake (p)
		gray tree frog (v)
		(2) green frog (s)
		(2) unidentified snakes
May 27, 2010	PMH 2	(7) eastern garter snake (s)
		(numerous) green frog
June 02, 2010	PMH 2	(2) gray treefrog (v)
		(4) eastern garter snake (s)
		eastern ribbon snake (h)
		pickerel frog (s)
		(numerous) green frog (s)
		(numerous) American toad (toadlets) (h)
	PMH 1	(6) eastern garter snake (s)
		(2) gray treefrog (v)
		(2) American toad (v)
June 03, 2010	PMH 2	eastern ribbon snake (h)
		(numerous) American toad (toadlets) (h)
	PMH 1	American toad (v)
		(numerous) spring peeper (v)
		gray treefrog (v)
		green frog (v)

* Species vocalization (v), sighted (s), handled (h), photographed (p).
** Number encountered in () before species name

In addition to the herpetofauna observed on site, there were several small and large mammals, and numerous birds and invertebrates. Some noteworthy wildlife included meadow jumping mouse *(Zapus hudsonius)*, hairy-tailed mole *(Parascalops breweri)*, eastern cottontail rabbit *(Sylvilagus floridanus)*, red-spotted purple butterfly *(Limenitis arthemis)*, viceroy butterfly *(Limenitis archippus)*, Baltimore checkerspot butterfly *(Euphydryas phaeton)*, Baltimore oriole *(Icterus galbula)*, scarlet tanager *(Piranga olivacea)*, warbling vireo *(Vireo gilvus)*, yellow warbler *(Dendroica petechia)*, and eastern towhee *(Pipilo erythrophthalmus)*.

A large portion of the eastern garter snakes were observed under fallen silt fence and along standing silt fence within and around PMH 2. Other eastern garter snakes were observed under construction debris and old housing materials such as tin roofing. However, a significant number of snakes; including eastern garter snakes, eastern ribbon snakes, and a northern water snake were observed basking in and traversing open habitat.

4.0 CONCLUSION

Based upon the 2008 eastern massasauga rattlesnake habitat assessment for the Proposed Mine #47 Site, it was determined that elements of eastern massasauga rattlesnake habitat were present, and two PMH survey areas were identified. Field visual encounter surveys conducted by Tetra Tech, Inc., in 2008 and 2010, and led by PFBC qualified eastern massasauga rattlesnake biologist, Dr. Glenn Johnson, did not document the presence or other physical evidence of this species in the survey areas. Based on the extensive visual encounter surveys performed over a 2-year period, Tetra Tech is of the opinion that mining and related activities within the proposed Mine #47 survey area should not have an adverse impact on the eastern massasauga rattlesnake.

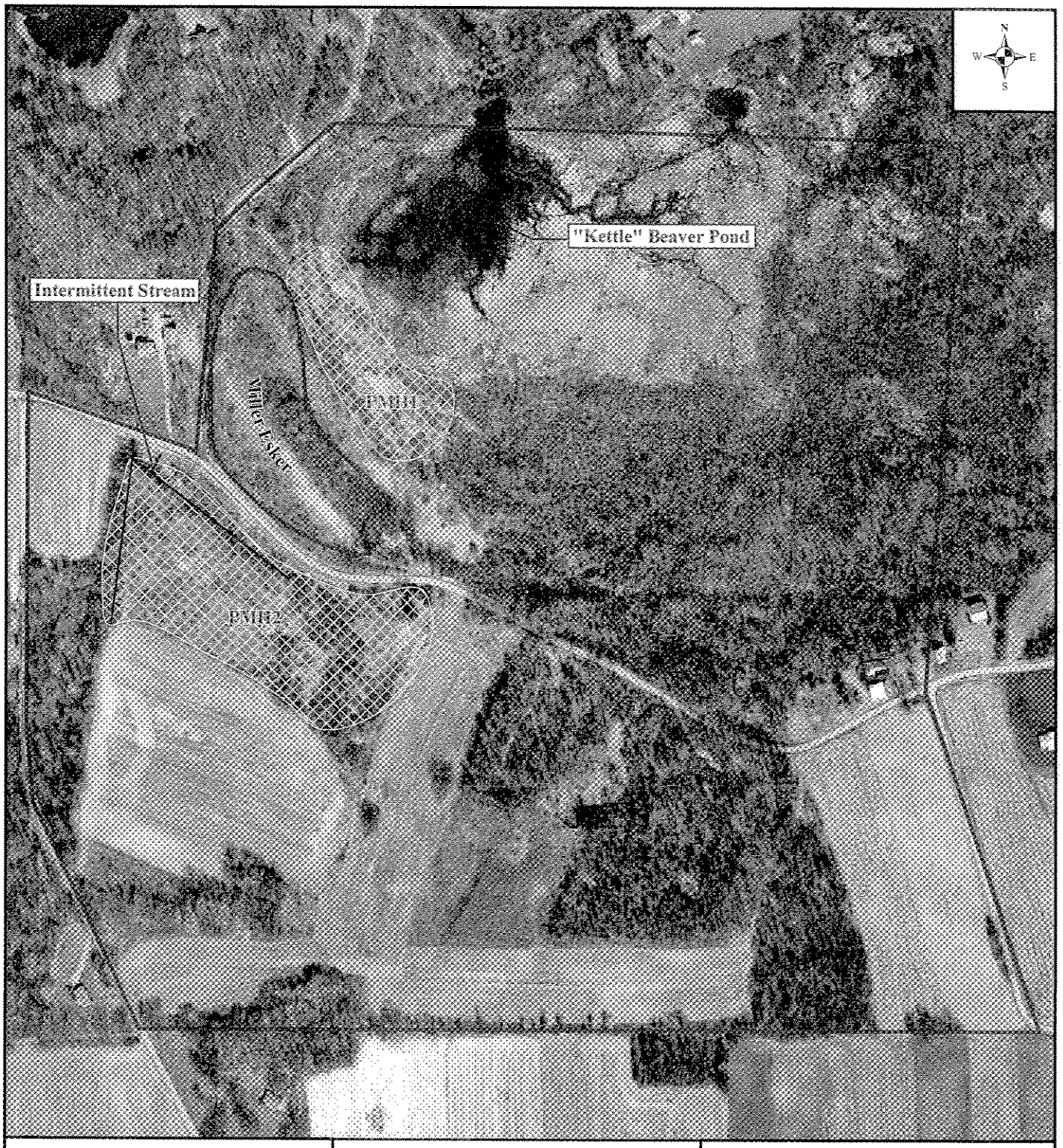
Sincerely,
Tetra Tech, Inc.

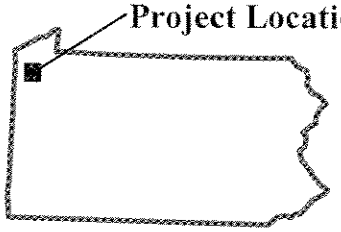
Justin L. Sweitzer
Associate Biologist

Glenn Johnson, Ph.D.
Senior Biologist

APPENDIX A

FIGURES





Source: 2006 Color Orthophotos of Pennsylvania, PAMAP Program, PA Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey

360 180 0 360

Feet

LEGEND

Project Boundary

Potential Massasauga Habitat

Esker

Figure 1. Proposed Mine #47 Site Map

Client: Glacial Sand and Gravel Company

Prepared By: TETRA TECH

Date: 06/2010

Z:/projects/Rattlesnake/Maps/Buffalo/PMHRev1

APPENDIX B

PHOTOGRAPHIC RECORD

PROPOSED MINE #47 – EASTERN MASSASAUGA SURVEY
PHOTO DOCUMENTATION

Company: Glacial Sand and Gravel Company

Project: Survey Results for Eastern Massasauga Rattlesnake *(Sistrurus c. catenatus) at Proposed Mine #47*

Photo No.: 1

Date: April 26, 2008

Direction: Northeast

Comments: View of wetland area and PMH 1 from Miller Esker. Vegetation in foreground is dominated by honeysuckle, arrow-wood viburnum, and autumn olive. Vegetation in the background, in the area of PMH 1 is dominated by forbs, grasses, and willow species.

Photo No.: 2

Date: April 26, 2008

Direction: West

Comments: View of PMH 1 from the eastern most side.

PROPOSED MINE #47 – EASTERN MASSASAUGA SURVEY
PHOTO DOCUMENTATION

Company: Glacial Sand and Gravel Company

Project: Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus c. catenatus*) at Proposed Mine #47

Photo No.: 3

Date: April 26, 2008

Direction: N/A

Comments: Chimney building crayfish burrows found in low lying areas at PMH 1.

Photo No.: 4

Date: April 26, 2008

Direction: West

Comments: View of western portion of PMH 1.

PROPOSED MINE #47 – EASTERN MASSASAUGA SURVEY
PHOTO DOCUMENTATION

Company: Glacial Sand and Gravel Company

Project: Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus c. catenatus*) at Proposed Mine #47

Photo No.: 5

Date: April 26, 2008

Direction: South

Comments: View of PMH 2 from intersection of Swope Road and West Liberty Road.

Photo No.: 6

Date: April 26, 2008

Direction: West

Comments: View of PMH 2 in area of depressional wetland. Small stream on western side of PHM 2 is within strip of trees. Field is dominated by soft rush and grass.

PROPOSED MINE #47 – EASTERN MASSASAUGA SURVEY
PHOTO DOCUMENTATION

Company: Glacial Sand and Gravel Company

Project: Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus c. catenatus*) at Proposed Mine #47

Photo No.: 7

Date: April 26, 2008

Direction: N/A

Comments: Eastern Garter snake (*Thamnophis s. sirtalis*) encountered at PMH 2 during initial habitat assessment.

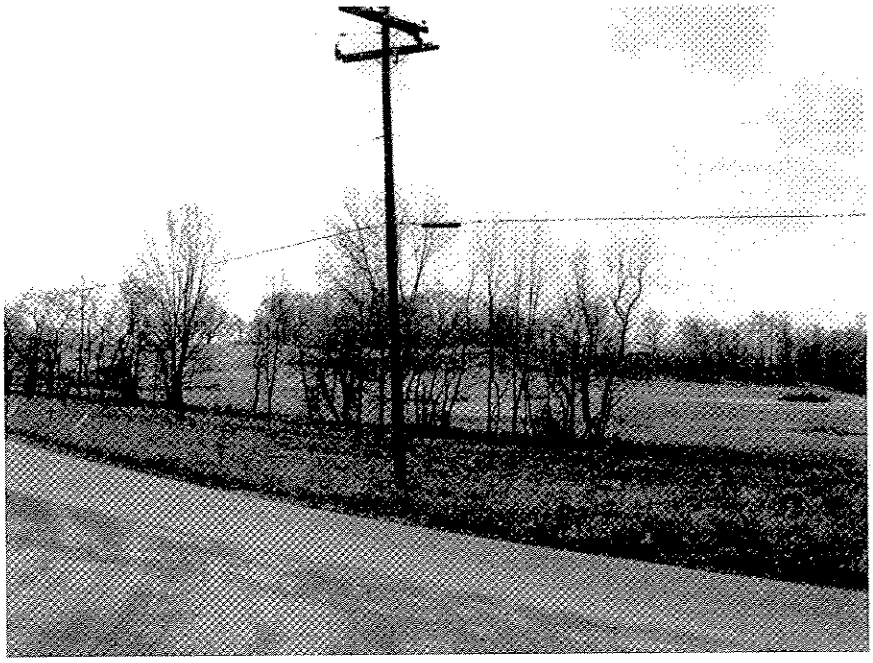


Photo No.: 8

Date: April 26, 2008

Direction: Southeast

Comments: View of northeastern portion of PMH 2 from intersection of Swope Road and West Liberty Road.

PROPOSED MINE #47 – EASTERN MASSASAUGA SURVEY
PHOTO DOCUMENTATION

Company: Glacial Sand and Gravel Company

Project: Survey Results for Eastern Massasauga Rattlesnake *(Sistrurus c. catenatus) at Proposed Mine #47*

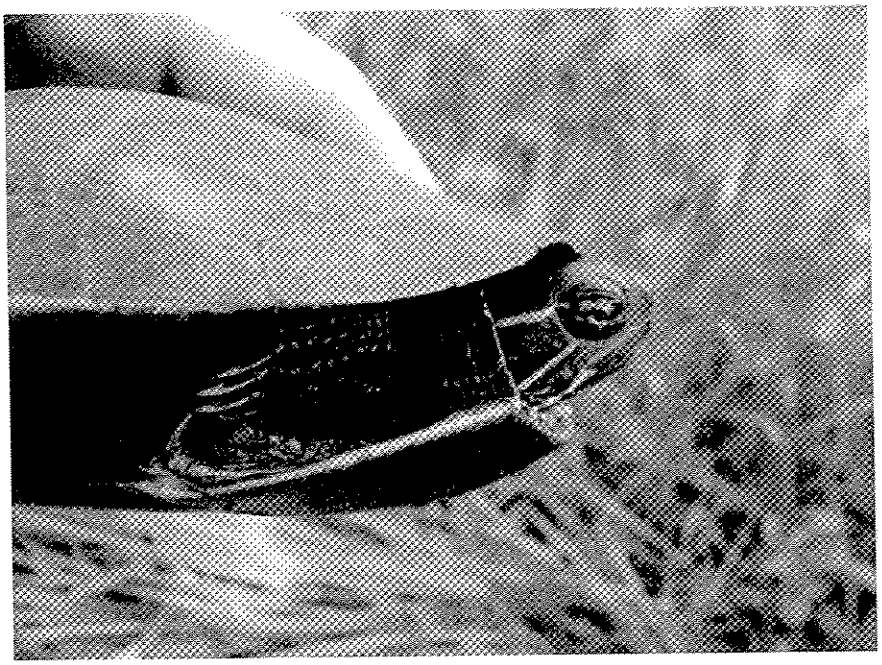


Photo No.: 9

Date: May 24, 2010

Direction: N/A

Comments: Painted turtle observed at PMH 1.

Photo No.: 10

Date: May 26, 2010

Direction: N/A

Comments: Northern water snake observed at PMH 1

PROPOSED MINE #47 – EASTERN MASSASAUGA SURVEY
PHOTO DOCUMENTATION

Company: Glacial Sand and Gravel Company

Project: Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus c. catenatus*) at Proposed Mine #47

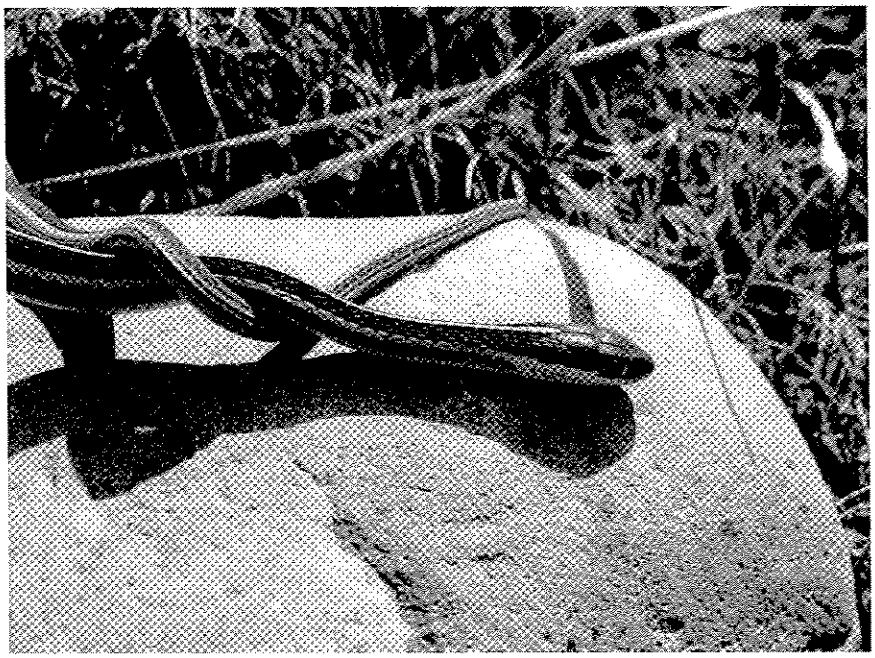


Photo No.: 11

Date: May 16, 2010

Direction: N/A

Comments: Eastern Ribbon Snake at PMH 2.

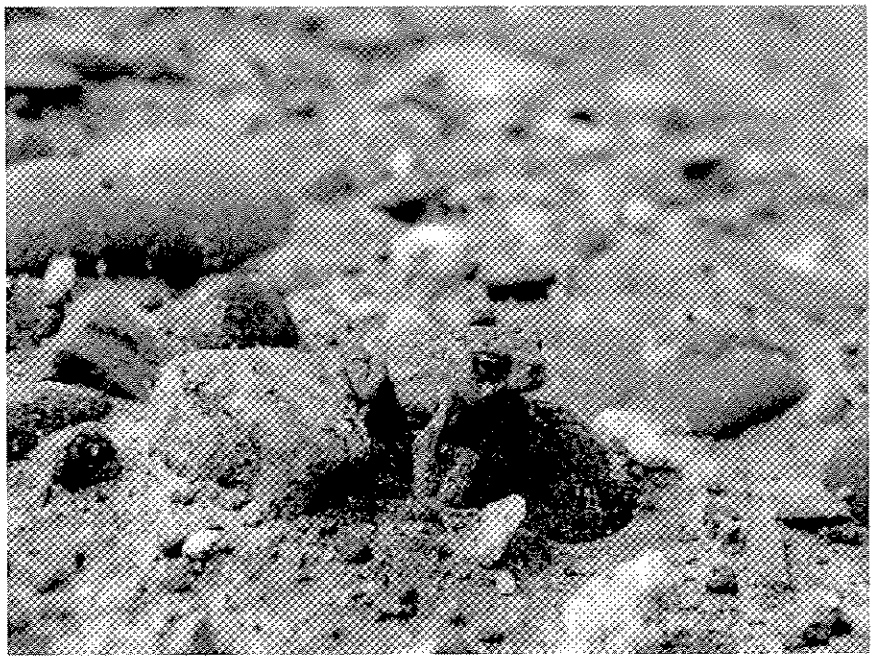


Photo No.: 12

Date: June 02, 2010

Direction: N/A

Comments: View of American Toad (toadlet) at PMH 2.

PROPOSED MINE #47 – EASTERN MASSASAUGA SURVEY
PHOTO DOCUMENTATION

Company: Glacial Sand and Gravel Company

Project: Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus c. catenatus*) *at Proposed Mine #47*

Photo No.: 13

Date: June 03, 2010

Direction: West

Comments: View of western portion of PMH 1.

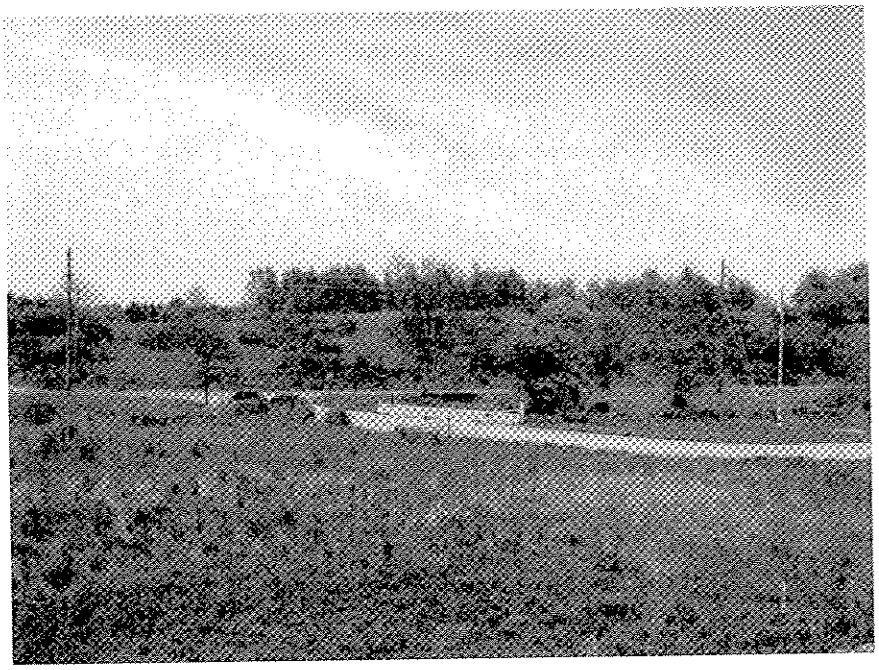


Photo No.: 14

Date: May 16, 2010

Direction: North

Comments: View of PMH 2 in area of depressional wetland. Access road placed on upland portion of PMH 2. West Liberty Road and Miller Esker in background.

PROPOSED MINE #47 – EASTERN MASSASAUGA SURVEY
PHOTO DOCUMENTATION

Company: Glacial Sand and Gravel Company

Project: Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus c. catenatus*) at Proposed Mine #47

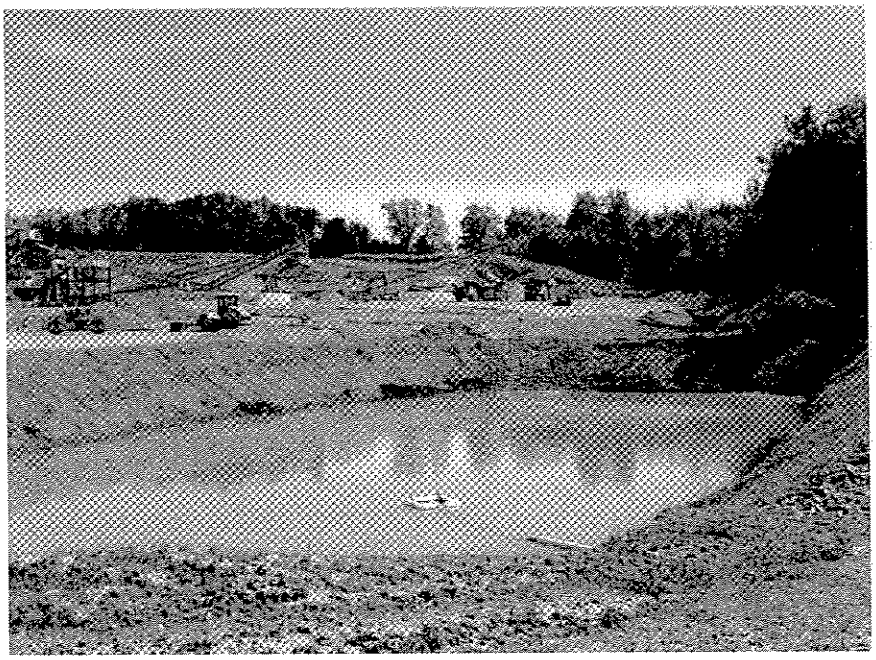


Photo No.: 15

Date: May 16, 2010

Direction: South

Comments: Stormwater management pond south of PMH 2.

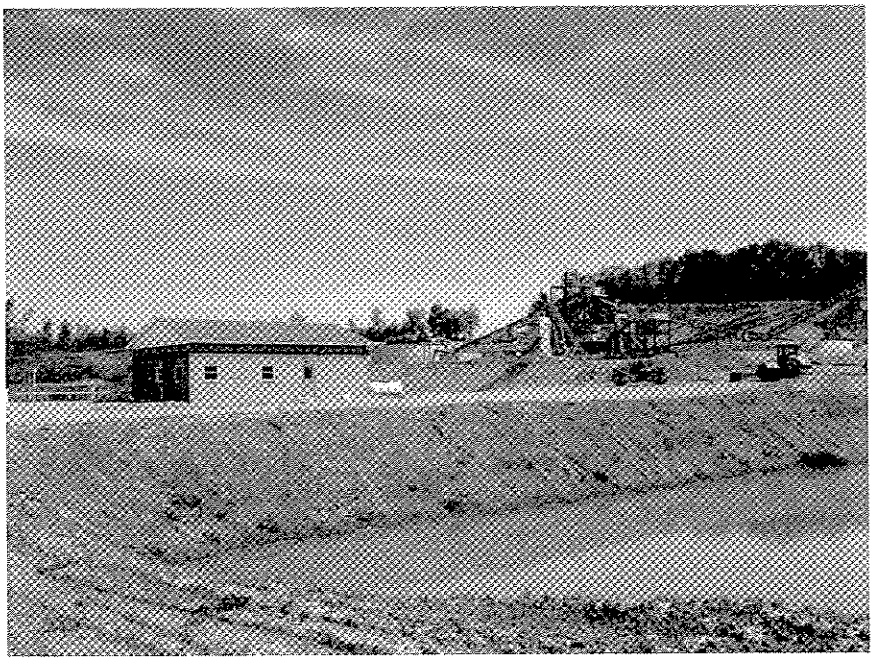


Photo No.: 16

Date: May 16, 2010

Direction: Southeast

Comments: View of gravel/sand sorting facility south of PMH 2.

PROPOSED MINE #47 – EASTERN MASSASAUGA SURVEY
PHOTO DOCUMENTATION

Company: Glacial Sand and Gravel Company

Project: Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus c. catenatus*) at Proposed Mine #47

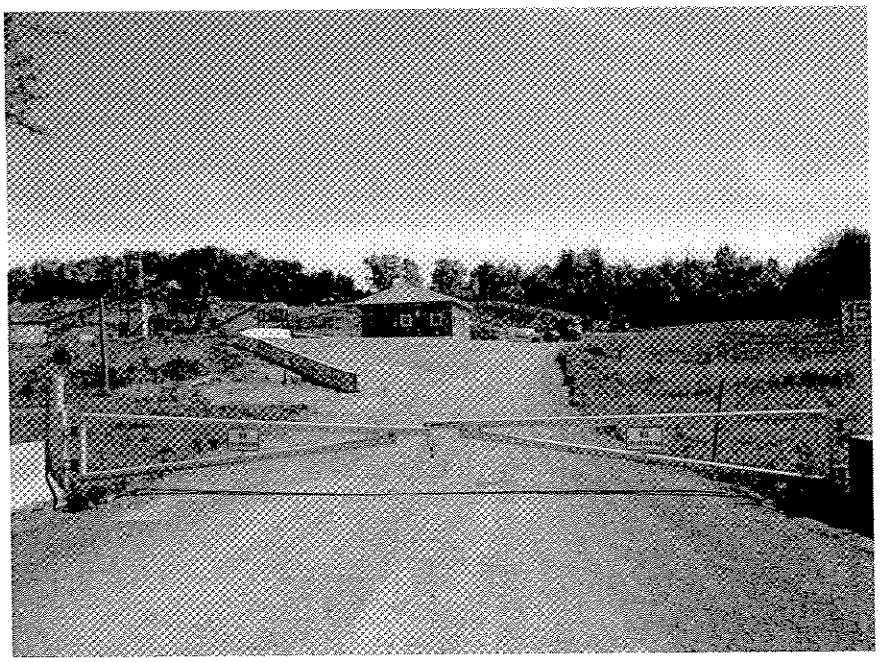


Photo No.: 17

Date: May 16, 2010

Direction: South

Comments: View of access road to gravel/sand sorting facility. Photo taken from West Liberty Road.

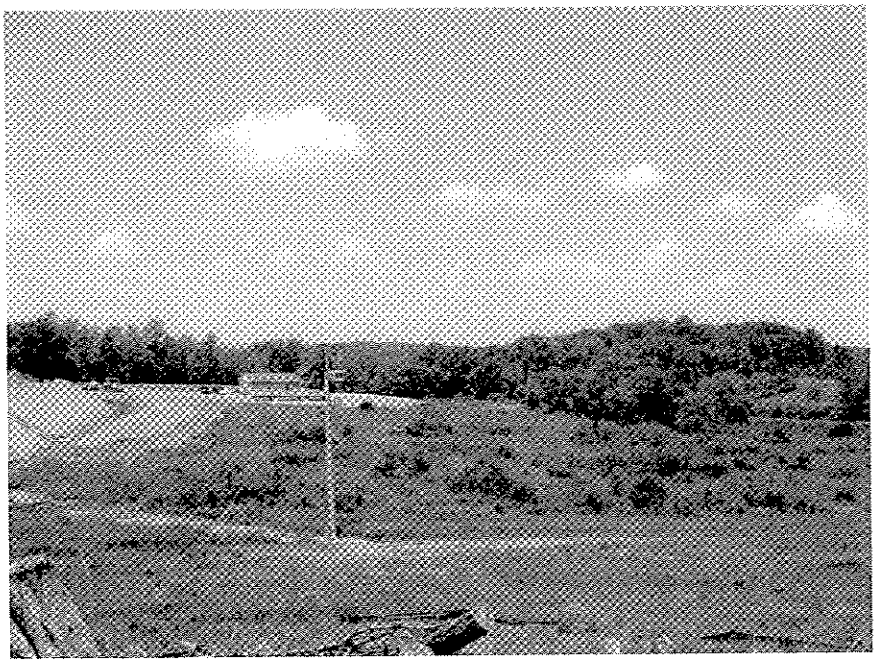


Photo No.: 18

Date: May 27, 2010

Direction: West

Comments: View of PMH 2 from east. Gravel/Sand sorting facility off photo to the left.

PROPOSED MINE #47 – EASTERN MASSASAUGA SURVEY
PHOTO DOCUMENTATION

Company: Glacial Sand and Gravel Company

Project: Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus c. catenatus*) at Proposed Mine #47

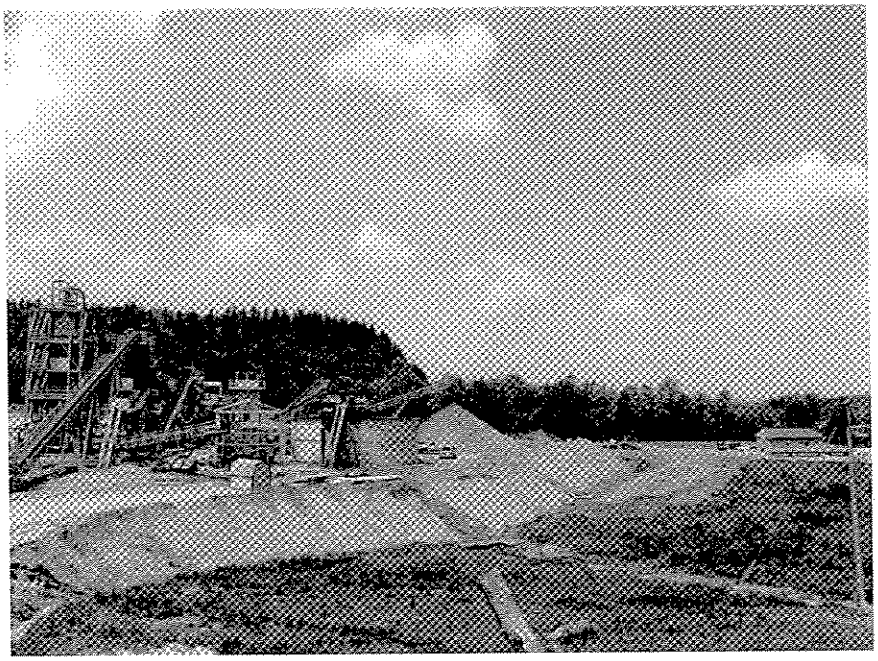


Photo No.: 19

Date: May 27, 2010

Direction: Southwest

Comments: View of gravel/sand sorting facility.

APPENDIX C

FIELD NOTES

Field Investigation April 26, 2008

On April 26th, at 08:00 hours (military time), Justin L. Sweitzer, TT Associate Biologist, and Dr. Glenn Johnson, Professor of Biology at SUNY Potsdam (hereafter referred to as "the field crew"), arrived at the intersection of Swope Road and West Liberty Road in Slippery Rock, PA. Upon arrival the field crew met with the client representatives, Darrel K. Lewis, Professional Engineer, and Jonathan Kolbe, Project/Operations Engineer. Following a brief overview of the site layout, the field crew and client representatives conducted a field survey of potential eastern massasauga habitat within the property boundaries as identified by Darrel K. Lewis, P.E.

At 08:15 hours, the field crew arrived at the first potential habitat survey area, depicted as PMH 1 in Figure 1 (Attachment A). This area is located on northeast side of the Miller Esker, north of West liberty Road and east of Swope Road. PMH 1 consists of maintained grass and shrub/willow habitat. PMH 1 is located south of an emergent wetland that is currently maintained by a resident beaver population. Due to the beaver activity the water levels in the wetland fluctuate periodically and seasonally. PMH 1 has a number of chimney building crayfish holes which, in this part of Pennsylvania, can be used by the massasauga as overwintering sites; and open grassland habitat which could provide basking sites for spring emergence and the presence of gravid females.
At 09:30 hours, the field crew surveyed a second potential habitat area, PMH 2 in Figure 1 (Attachment A). This area is located south of West Liberty Road and is dominated by cultivated grasses and emergent wetlands. The wetlands appear to be depressional drainage swales and low laying areas characterized by emergent sedges and rushes. Crayfish chimneys scattered in the open field could provide suitable overwintering habitat for massasauga.
A garter snake was encountered at 09:45, gray tree frog and American toad heard at 09:00.

Field Investigation May 10, 2008

On May 10, 2008, at 09:00 hours, the field crew arrived at the site to begin the first survey period. Cloud cover was approximately 85% and it had rained the previous night; air temperature was 48.5°F; average wind speed of 0.7 m/sec; and a relative humidity (RH) of 90%. The field crew surveyed PMH1 from 09:00 to 10:00 with no reptile or amphibian encounters. Upon completion of PMH1 survey the field crew collected the following weather data and proceeded to PMH2. At 10:00 the air temperature was 55.8°F; average wind speed of 0.6 m/sec; RH 63%; with 70% cloud cover. No reptile or amphibian encounters were made during the survey of PMH2. The field crew discontinued the survey of Proposed Mine No. 47 at 12:30.

Field Investigation May 24, 2008

On May 24, 2008, at 08:50 hours, the field crew arrived at the site to begin the second survey period. There were no clouds; air temperature was 55.6°F; average wind speed of 0.0 m/sec; and a relative humidity (RH) of 73%. The field crew surveyed PMH1 from 09:00 to 10:45 with two garter snake encounters. Upon completion of PMH1 survey the field crew collected the following weather data and proceeded to PMH2. At 10:45 the air temperature was 63.2°F; average wind speed of 0.3 m/sec; RH 59%; with no cloud cover. No reptile or amphibian encounters were made during the survey of PMH2. The field crew discontinued the survey of Proposed Mine No. 47 at 12:30.

Field Investigation June 09, 2008

On June 9, 2008, at 08:00 hours, the field crew arrived at the site to begin the third survey period. There was 85% cloud cover; air temperature was 74.8°F; average wind speed of 0.6 m/sec' and a relative humidity (RH) of 89%. The field crew surveyed PMH1 from 08:00 to 10:00 with no reptile species encountered. The field crew heard a grey tree frog at 08:35. Upon completion of PMH1 survey the field crew continued on to survey PMH2. No reptile encounters were made during the survey of PMH2, however; the field crew heard multiple grey tree frogs. The field crew discontinued the survey of Proposed Mine No. 47 at 11:30.

05/16/2010

Survey Crew: Glenn Johnson, Justin Sweitzer, Sarah Haugh, Nikki Finch

Surveyed PMH 2 from 1030 -1200

Weather conditions at 1030:

Ambient temp. 63.5 °F
Ground temp. 84.0 °F
Average windspeed 0.9 m/s
Sunny with clouds

Notes:

Upon arrival it was noted that a new permitted access road and gravel/sand sorting facility were built since the surveys performed in 2008. The facility was built on the north facing slope immediately south of the survey area. The access road is located on an upland lobed portion of the survey area.

Observations:

1 gray treefrog (v)
7 eastern garter snakes (s)
1 pickerel frog (s)
Several green frogs around stormwater retention pond (s)

Surveyed PMH 1 from 1200 - 1415

Weather conditions at 1200:

Ambient temp. 63.9 °F
Ground temp. 100.0 °F
Average windspeed 1.0 m/s
Sunny with clouds

Notes:

Upon arrival at PMH1 it was noted that the water level of the beaver pond and associated wetland fringe appeared lower than during the 2008 survey period. There also appeared to be fewer crayfish burrows.

Observations:

1 eastern garter snake (s)
2 green frogs (s)

Surveyed PMH 2 from 1415 - 1730

Weather conditions at 1600:

Ambient temp. 72.5 °F
Ground temp. 96.4 °F
Average windspeed 1.0 m/s
Sunny with clouds (5%)

NO EASTERN MASSASAUGA RATTLESNAKES OBSERVED

05/24/2010

Survey Crew: Glenn Johnson, Justin Sweitzer, Nikki Finch

Surveyed PMH 1 from 1445 -1845

Weather conditions at 1445:

Ambient temp. 76.0 °F
Ground temp. 100.0 °F
Average windspeed 1.5 m/s
Overcast

Observations:

3 eastern garter snakes (s)
gray treefrog (v)
2 red-backed salamander (s)
1 meadow vole (s)
1 painted turtle (p)

Weather conditions at 1845:

Ambient temp. 83.0 °F
Ground temp. 85.0 °F
Average windspeed 2.2 m/s
Mixed clouds and sun

NO EASTERN MASSASAUGA RATTLESNAKES OBSERVED

5/25/2010

Survey Crew: Glenn Johnson, Justin Sweitzer, Sarah Haugh, Nikki Finch

Surveyed PMH 2 from 0830 - 1200

Weather conditions at 0830:

Ambient temp. 67.0 °F
Ground temp. 98.0 °F
Average windspeed 0.6 m/s
Sunny, clear skies

Weather conditions at 1200:

Ambient temp. 86.5 °F
Ground temp. 108.0 °F
Average windspeed 1.1 m/s
Sunny with few clouds

Surveyed PMH 2 from 1230 - 1600

Weather conditions at 1600:

Ambient temp. 81.0 °F
Ground temp. 110.0 °F
Average windspeed 0.4 m/s
Sunny with few clouds

Observations:

7 eastern garter snakes (s)
1 American toad (s)
Numerous green frogs (s)
1 meadow jumping mouse (s)

NO EASTERN MASSASAUGA RATTLESNAKES OBSERVED

5/26/2010

Survey Crew: Glenn Johnson, Justin Sweitzer, Sarah Haugh, Nikki Finch

Surveyed PMH 1 from 0730 - 1030

Weather conditions at 0730:

Ambient temp. 66.0 °F
Ground temp. 68.6 °F
Average windspeed 0.8 m/s
Sunny, clear skies

Observations:

1 eastern garter snakes (s)
1 northern water snake (p)
Gray treefrog (v)
1 green frog (s)
2 unidentified snakes (likely eastern garter snakes based on movement and color pattern)

Weather conditions at 1030:

Ambient temp. 84.0 °F
Ground temp. 94.0 °F
Average windspeed 0.8 m/s
Clear sunny skies

NO EASTERN MASSASAUGA RATTLESNAKES OBSERVED

5/27/2010

Survey Crew: Glenn Johnson, Justin Sweitzer, Sarah Haugh, Nikki Finch

Surveyed PMH 2 from 0730 - 1200

Weather conditions at 0730:

Ambient temp. 62.0 °F
Ground temp. 68.0 °F
Average windspeed 0.4 m/s
Clear skies with haze

Weather conditions at 1200:

Ambient temp. 88.0 °F
Ground temp. 98.0 °F
Average windspeed 0.4 m/s
Sunny with few clouds

Surveyed PMH 2 from 1230 - 1500

Weather conditions at 1500:

Ambient temp. 86.0 °F
Ground temp. 112.0 °F
Average windspeed 0.4 m/s
Sunny with few clouds

Observations:

7 eastern garter snakes (s)
Numerous green frogs (s)

NO EASTERN MASSASAUGA RATTLESNAKES OBSERVED

6/02/2010

Survey Crew: Glenn Johnson, Justin Sweitzer, Sarah Haugh, Nikki Finch

Surveyed PMH 2 from 0730 - 1200

Weather conditions at 0730:

Ambient temp. 58.0 °F
Ground temp. 66.0 °F
Average windspeed 0.4 m/s
Clear skies with haze

Observations:

gray treefrogs (v)
3 eastern garter snakes (s)
1 eastern ribbon snake (p)
1 pickerel frog (s)
Numerous green frogs (s)
Numerous American toad toadlets (p)

Weather conditions at 1200:

Ambient temp. 78.0 °F
Ground temp. 98.0 °F
Average windspeed 0.4 m/s

Sunny with few clouds

Surveyed PMH 2 from 1230 - 1430

Observations:

1 eastern garter snake (s)
1 green frog (s)

Surveyed PMH 1 from 1430 - 1530

Observations:

6 eastern garter snakes (s)
gray treefrog (v)
American toad (v)

Weather conditions at 1530 (stop survey due to rain):

Ambient temp. 79.0 °F
Ground temp. 78.0 °F
Average windspeed 0.4 m/s
Cloudy with rain

Restart survey of PMH 1 after passing showers:

Surveyed PMH 1 from 1630 - 1800

Weather conditions at 1630:

Ambient temp. 76.0 °F
Ground temp. 86.0 °F
Average windspeed 0.4 m/s
Sun and clouds

Observations:

gray treefrogs (v)
American toads (v)

Weather conditions at 1800 (end survey due to rain):

Ambient temp. 73.0 °F
Ground temp. 80.0 °F
Average windspeed 0.4 m/s
Overcast with rain

NO EASTERN MASSASAUGA RATTLESNAKES OBSERVED

6/03/2010

Survey Crew: Glenn Johnson, Justin Sweitzer, Sarah Haugh, Nikki Finch

Surveyed PMH 2 from 0730 - 0830

Weather conditions at 0730:

Ambient temp. 63.0 °F
Ground temp. 70.0 °F
Average windspeed 1.1 m/s
Overcast

Observations:

1 eastern ribbon snake (h)
Numerous American toad toadletts (s)
Unknown shrew

Surveyed PMH 1 from 0830 - 0930

Weather conditions at 0930:

Ambient temp. 66.0 °F
Ground temp. 76.0 °F
Average windspeed 1.1 m/s
Overcast

Observations:

spring peeper (v)
American toads (v)
green frog (v)
gray treefrog (v)

NO EASTERN MASSASAUGA RATTLESNAKES OBSERVED

APPENDIX D

PFBC APPROVED SURVEY OPTIONS

Option A: Combination of Visual Encounter Surveys and Coverboard Surveys

Visual Encounter Surveys (Performed April 15 - June 15):

PMH1:

- 3 surveyors @ 2.0 hours per site visit = 6.0 person hours/ 2.0 acres = 3.0 person hours/acre/site visit (PFBC requires 3-6 person hours/acre/site visit)

PMH2:

- 3 surveyors @ 5 hours per visit = 15 person hours/4.5 acres = 3.3 hours/acre/site visit (PFBC requires 3-6 person hours/acre/site visit)

This would require 2 staff biologists and 1 Eastern Massasauga Rattlesnake Biologist (2-8 hour travel days, 1-10 hour field day/visit). Four (4) Visits would be required.

Coverboard Surveys (Performed June 1 - October 10):

Possible Massasauga Habitat (PMH) 1: 2 acres

- 10-20 (3'x3' or 2'x3') wooden coverboards placed mid to late April
- Check coverboards once in June, July, August, and October
- Check coverboards twice in September

This would require 1 staff biologist familiar with the use of coverboards.

PMH 2: 4.5 acres

- 23-45 coverboards placed mid to late April
- Check coverboards once in June, July, August, and October
- Check coverboards twice in September

This would require 1 staff biologist familiar with the use of coverboards.

Option B: Visual Encounter Surveys Only

Visual Encounter Surveys (Performed April 15 - June 15):

PMH1:

- 4 surveyors @ 3 hours per site visit = 12 person hours/ 2.0 acres = 6.0 person hours/acre/site visit (PFBC requires 3-6 person hours/acre/site visit)

PMH2:

- 4 surveyors @ 7 hours per visit = 28 person hours/4.5 acres = 6.22 hours/acre/site visit (PFBC requires 3-6 person hours/acre/site visit)

This would require 3 staff biologists and 1 Eastern Massasauga Rattlesnake Biologist (2-8 hour travel days, 1-10 hour field day, and 1-8 hour field day/visit). Four (4) Visits would be required.

APPENDIX E

AGENCY EMAIL CORRESPONDENCE

Sweitzer, Justin

From: Gipe, Kathy [c-kgipe@state.pa.us]
Sent: Thursday, April 15, 2010 9:16 AM
To: Sweitzer, Justin
Subject: RE: Species Impact Review (SIR) #33499

Justin,

A few day separation of survey visits is preferred, but the protocol does not require this.

--Kathy

-----Original Message-----
From: Sweitzer, Justin [mailto:Justin.Sweitzer@tetratech.com]
Sent: Thursday, April 08, 2010 1:32 PM
To: Gipe, Kathy
Subject: RE: Species Impact Review (SIR) #33499

Ms. Gipe,

Thank you for the quick response. One last question that I have for you is whether or not we would be able to perform site visits in consecutive days. For example: could we do site visit #1 on a Saturday and site visit #2 on a Sunday during the same weekend (if weather conditions were appropriate)?

Regards,
Justin

Justin Sweitzer | Biologist

Direct: 207.879.9496 x 240 | Fax: 207.879.9481
justin.sweitzer@tetratech.com

Tetra Tech | Complex World, Clear Solutions
451 Presumpscot St. | Portland, ME 04103 | www.tetratech.com
PLEASE NOTE: This message, including any attachments, may include privileged, confidential and/or inside information. Any distribution or use of this communication by anyone other than the intended recipient is strictly prohibited and may be unlawful. If you are not the intended recipient, please notify the sender by replying to this message and then delete it from your system.

From: Gipe, Kathy [mailto:c-kgipe@state.pa.us]
Sent: Thursday, April 08, 2010 8:41 AM
To: Sweitzer, Justin
Cc: Urban, Chris; Kepler, Steven; Myers, Paul; Glenn Johnson
Subject: RE: Species Impact Review (SIR) #33499

Justin,

Thank you for sending the proposed protocols for our review. Number one (with coverboards) would be the optimal survey, as it uses multiple detection methods to cover all the potential habitats. However, given the increased effort proposed, number two would also be acceptable. If you do use coverboards, you may as well check them as you do the spring surveys as well. Some species will colonize them right away and since you are out there anyway, it doesn't take much to peek underneath. While massasauga are not typically an agressive snake, coverboards should always be lifted from the side away from the observer in order to offer protection to the observer from any surprised snakes.
We have had several reports of the massasauga being active this week, so best wishes getting the surveys started right away.

Sincerely,

--Kathy

Kathy Gipe
Herpetologist/Nongame Biologist
Natural Diversity Section
Pennsylvania Fish and Boat Commission
450 Robinson Lane
Bellefonte, PA 16823
814-359-5186
c-kgipe@state.pa.us

-----Original Message-----
From: Sweitzer, Justin [mailto:Justin.Sweitzer@tetratech.com]
Sent: Tuesday, April 06, 2010 1:01 PM
To: Gipe, Kathy
Cc: Urban, Chris; Kepler, Steven; Myers, Paul; Glenn Johnson
Subject: RE: Species Impact Review (SIR) #33499

Ms. Gipe,

Attached are a couple of options I put together for performing Eastern Massasauga Rattelsnake Surveys for Glacial Sand and Gravel and the proposed mine 47. Could you please take a look and let me know if you would like me to make any changes? Any input you might have would be much appreciated.

Regards,
Justin

Justin Sweitzer | Biologist

Direct: 207.879.9496 x 240 | Fax: 207.879.9481
justin.sweitzer@tetratech.com

Tetra Tech | Complex World, Clear Solutions
451 Presumpscot St. | Portland, ME 04103 | www.tetratech.com
PLEASE NOTE: This message, including any attachments, may include privileged, confidential and/or inside information. Any distribution or use of this communication by anyone other than the intended recipient is strictly prohibited and may be unlawful. If you are not the intended recipient, please notify the sender by replying to this message and then delete it from your system.

From: Gipe, Kathy [mailto:c-kgipe@state.pa.us]
Sent: Tuesday, March 23, 2010 12:49 PM
To: Sweitzer, Justin
Cc: Urban, Chris; Kepler, Steven
Subject: RE: Species Impact Review (SIR) #33499

Mr. Sweitzer,

We have reviewed your questions pertaining to survey guidelines for the eastern massasauga at Proposed Mine 47 (Rodgers Plant). I will restate the guidelines here as they pertain to your questions. You may count the person-hours already invested in previous years towards the total needed [I calculate 4.5, 5, 7, and 7 from your report]. While our use of the words "should" and "recommended" may imply that something is not mandatory, please recognize that survey results appear less reliable the more short cuts in survey effort that appear to have been taken.

In your survey report, you stated that the two wetlands were approximately 2 and 4.5 acres. If the potential eastern massasauga habitat is less than this acreage, that should be delineated so hours of effort needed are appropriately calculated. According to the survey protocol, this acreage would require

from 19.5-39 person hours per site visit. We recognize that a large area such as this can be difficult to survey for so many hours. In our experience with this and other species, the surveyor has adapted his/her methods to accomodate the size of the wetland, for example using supplemental detection techniques such as coverboards and employing larger survey crews. Note that additional assistants should be trained in detection techniques and the habits of the massasauga prior to a survey. The size of this site makes it a particularly good candidate for the use of coverboards.

- Surveys should be a combination of visual encounter surveys and coverboard sampling. Visual encounter surveys must be performed during the period from April 15 - June 15.

- Air temperatures should be at or above 60 degrees F, or the wet soil temperature should be at or above 60 degrees F. [Generally, on a large site, using additional surveyors in order to target optimal conditions rather than stretching out every hour of daylight is a more effective survey technique. One or two individuals would be challenged to remain alert and interested for a 12-hour survey.]

- A minimum of four visual encounter surveys per site is needed to accurately assess the area for massasaugas.

- Visual encounter surveys should be conducted for a minimum of 3 to 6 person hours per acre of suitable habitat per site visit.

- If the surveyor chooses not to use coverboards, then we would expect to see added effort in visual encounter surveys (not the minimum 3 hours) in order to make up for this deficiency, as well as an explanation in the report of the methods chosen.

If you or the surveyor have any questions about the survey protocol or your specific survey plan, please contact us prior to initiating the work so any modifications necessary can be made before the survey season begins. Thank you.

Sincerely,

--Kathy

Kathy Gipe
Herpetologist/Nongame Biologist
Natural Diversity Section
Pennsylvania Fish and Boat Commission
450 Robinson Lane
Bellefonte, PA 16823
814-359-5186
c-kgipe@state.pa.us

-----Original Message-----
From: Sweitzer, Justin [mailto:Justin.Sweitzer@tetratech.com]
Sent: Wednesday, March 17, 2010 4:58 PM
To: Gipe, Kathy

Cc: Urban, Chris; Myers, Paul; Darrel Lewis
Subject: Species Impact Review (SIR) #33499

Dear Ms. Kathy Gipe,

Thank you for your comments in your letter dated February 23, 2010 regarding the presence/absence survey for the Eastern Massasauga Rattlesnake at Proposed Mine 47 (Rodgers Plant). In your letter you stated that additional survey effort is needed to determine the presence/absence of the above mentioned species. Would you be able to provide, more specifically, what additional effort would be needed to satisfy the PFBC. Also, could you please elaborate on the PFBC "recommended" guidelines with respect to the following concerns:

1) **No coverboards were used as a method of survey, as "recommended" in the PFBC guidelines.** It is our understanding that the term "recommended" or "should" used in the PFBC guidelines suggests that coverboards are not "required" rather they may provide additional opportunity for encountering Eastern Massasauga Rattlesnakes.
2) **Air temperatures were significantly below "recommended" 60°F on one of the three survey dates.** Again, it is our understanding that the term "recommended" or "should" used in the PFBC guidelines suggests that an air or wet soil temperature of 60°F is not required to perform visual encounter surveys. In general, during the survey period of April 15 to June 15 the air or wet soil temperature rarely remains above 60°F for a 12 hour period (based on 2 person survey team) in any given day (13.5 to 23 person hours/visit as required for a 4.5 acre parcel).
3) **Only three survey visits were conducted, rather than the minimum of four in the PFBC guidelines.** Technically, four survey visits were conducted when the original site visit is included (surveys were performed on this day by myself and Glenn Johnson).
4) **Time spent on visual encounter surveys averaged less than one person-hour per acre, as opposed to the 3-6 hours per acre required in the PFBC guidelines.** We agree that our "per site visit" hours are low as we originally took the PFBC guidelines to read person hours per acre of suitable habitat searched per site.

Regards,
Justin L. Sweitzer

APPENDIX F

SCIENTIFIC COLLECTOR'S PERMIT

NC/NE/NW/SC/SE/SW

COMMONWEALTH OF PENNSYLVANIA

PENNSYLVANIA FISH AND BOAT COMMISSION

Bureau of Fisheries - Envirnomental Services Division - Natural Diversity Section
450 Robinson Lane
Belllefonte, PA 16823

May 18, 2010 | Permit Fee of $105 | Page 1 - PERMIT NO. 349 TYPE 3 (Amendment)

THIS IS TO CERTIFY THAT ACTING UNDER THE PROVISIONS OF THE FISH AND BOAT CODE, ACT 1980-175 AMENDED:

Name and Town of Permit Owner	Age,	Height,	Weight,	Eyes,	Hair,	PA Fishing License #
[redacted]	[redacted]					

APPROVED ASSISTANTS TO THE ABOVE PERMIT OWNER:

Name and Address	Age,	Height,	Weight,	Eyes,	Hair,	PA Fishing License #
[redacted]	[redacted]					

Exemption #6 - Privacy

AND ASSISTANTS LISTED, ARE HEREBY AUTHORIZED TO COLLECT FISH OR OTHER AQUATIC LIFE FOR SCIENTIFIC PURPOSES AND IS LIMITED TO THOSE ACTIVITIES AS DESCRIBED IN RESPONSE TO THE APPLICATION PROJECT DETAILS SECTION. THIS PERMIT IS VALID FOR COLLECTION PROJECTS: (SEE ATTACHED SHEET)

UNLESS OTHERWISE PERMITTED, ALL SPECIES MUST BE RELEASED UNHARMED AT SITE OF CAPTURE. A SCIENTIFIC COLLECTOR'S PERMIT DOES NOT GRANT THE PERSONS THE AUTHORITY TO TRESPASS ON PRIVATE PROPERTY.

THIS PERMIT IS GOOD FOR THE CALENDAR YEAR **2010** OR DATE SPECIFIED IN PERMIT CONDITIONS, WHICHEVER COMES FIRST.

THE OWNER OF THIS PERMIT AND LISTED ASSISTANTS MUST BE THE HOLDERS OF A RESIDENT OR NONRESIDENT FISHING LICENSE WHICH MUST BE CARRIED WITH THEM AT ALL TIMES, ALONG WITH THIS PERMIT, OR A COPY THEREOF. PROPER NOTIFICATION MUST BE GIVEN TO THE REGIONAL LAW ENFORCEMENT OFFICE COVERING THE COUNTY IN WHICH COLLECTIONS ARE BEING CONDUCTED. OFFICES ARE OPEN MONDAY THRU FRIDAY BETWEEN 8:00AM AND 4:00PM.

IN WITNESS THEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIXED THE OFFICAL SEAL OF THE COMMISSION THE DAY AND DATE FIRST ABOVE WRITTEN.

EXECUTIVE DIRECTOR OR DESIGNEE

Permit Conditions/Comments From PFBC Natural Diversity Section Staff

ANY THREATENED OR ENDANGERED SPECIES, AS LISTED IN 58 PA CODE CHAPTERS 73 AND 75, CAPTURED BY THE PERMITTEE OR ANY ASISTANT SHALL BE IMMEDIATELY RETURNED TO THE ENVIRONMENT FROM WHICH IT WAS COLLECTED. PERSONS COLLECTING FISH, REPTILES, OR AMPHIBIANS ON STATE GAME LANDS MUST NOTIFY THE APPROPRIATE PENNSYLVANIA GAME COMMISSION (WWW.PGC.STATE.PA.US) REGIONAL OFFICE BY PHONE AT LEAST 24 HOURS PRIOR TO COMMENCING THOSE ACTIVITIES. ANY OTHER AREA MUST BE APPROVED BY THE PENNSYLVANIA FISH AND BOAT COMMISSION.

Authorized Collection Projects:

PROJECT NAME: **Proposed Mine 47**.
PROJECT COLLECTION JUSTIFICATION: x_Other (give details in project justification text box).
SAMPLE SIZE APPROVED: Other (give details in project justification text box).
PROJECT DETAILS: Providing private consulting for a client in order to determine if the clients property has significant habitat for the eastern massasauga. If specimens are located information such as SVL,approximate age, and sex will be determined in the field and the snake will be released.

APPROVED FOR EASTERN MASSASAUGA SURVEYS AND MEASUREMENTS. CAPTURED ANIMALS SHALL BE RELEASED WHERE THEY WHERE CAPTURED.
TAXONS COLLECTED: Reptiles
CRITTER DISPOSITION: Capture, Process, Live Release
PROJECT COUNTIES: BUTLER, PROJECT WATERS:

PROJECT NAME: **Proposed Mine 44**.
PROJECT COLLECTION JUSTIFICATION: x_Other (give details in project justification text box).
SAMPLE SIZE APPROVED: Other (give details in project justification text box).
PROJECT DETAILS: Providing Private Consultation for a client. The client has asked to have an eastern massasauga survey completed to determine if suitable habitat is present on his/her property.

APPROVED FOR EASTERN MASSASAUGA SURVEYS AND MEASUREMENTS. CAPTURED ANIMALS SHALL BE RELEASED WHERE THEY WHERE CAPTURED.
TAXONS COLLECTED: Reptiles
CRITTER DISPOSITION: Capture, Process, Live Release
PROJECT COUNTIES: BUTLER, PROJECT WATERS:

PROJECT NAME: **The Sproul Trunk Line**.
PROJECT COLLECTION JUSTIFICATION: Pre/Post Development Bioassessment.
SAMPLE SIZE APPROVED: Other (give details in project justification text box).
PROJECT DETAILS: This project is a Timber rattlesnake Survey with potential follow-up monitoring during construction of proposed natural gas pipeline (see SIR# 32800 for more detail)...the pipeline begins in Clinton County, but all requested surveys are in Centre Co.

All timber rattlesnakes encountered will be recorded and handling will be minimized, except during potential monitoring phase where snakes will be moved to nearest suitable habitat. None will be collected.

APPROVED FOR TIMBER RATTLESNAKE SURVEYS AND MONITORING FOR the Sproul Trunk Line PROJECT, CLINTON AND CENTRE CO'S
TAXONS COLLECTED: Reptiles
CRITTER DISPOSITION: Capture and Immediate Release
PROJECT COUNTIES: CENTRE, PROJECT WATERS:

PROJECT NAME: **Grugan Gathering System Phase 2**.
PROJECT COLLECTION JUSTIFICATION: Pre/Post Development Bioassessment.
SAMPLE SIZE APPROVED: Other (give details in project justification text box).
PROJECT DETAILS: This project will likely be a Timber rattlesnake monitoring project along sections of a proposed pipeline (see SIR# 32694 for more details); it extends into Lycoming County as well.

Timber rattlesnakes encountered will be moved to the nearest suitable habitat

APPROVED FOR TIMBER RATTLESNAKE CONSTRUCTION MONITORING FOR Grugan Gathering System Phase 2 PROJECT, LYCOMING CO
TAXONS COLLECTED: Reptiles
CRITTER DISPOSITION: Capture and Immediate Release

PROJECT COUNTIES: CLINTON, PROJECT WATERS:

Bureau of Fisheries
Environmental Services Division
Natural Diversity Section

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA FISH AND BOAT COMMISSION

Scientific Collector Permit Issued To:
Glenn Johnson
PA Fishing License #: 015-607-229

THIS PERMIT IS GOOD FOR THE CALENDAR YEAR **2010** OR DATE SPECIFIED IN PERMIT CONDITIONS, WHICHEVER COMES FIRST

NETS LARGER THAN 4 FEET SQUARE OR 4 FEET IN DIAMETER LISTED ON THIS PERMIT HAVE BEEN APPROVED FOR USE BY THE PERMIT HOLDER. THE REQUIREMENT FOR ADDITIONAL NETTING PERMITS FOR ANY OF THE BELOW LISTED NETS EXCEEDING MAXIMUM SIZE HAS BEEN WAIVED

THIS IS TO CERTIFY THAT ACTING UNDER THE PROVISIONS OF CHAPTER 29 OF THE FISH AND BOAT CODE, ACT 1980-175 AMENDED, 30 PA. C.SS CH29, THE OWNER OF THIS PERMIT IS HEREBY AUTHORIZED TO POSSESS THE FOLLOWING NET/NETS/ELECTROFISHING GEAR. ALL NETS SET WITHIN A COLLECTION DAY MUST BE TENDED DAILY.

Permit Authorized Gears Listed By User Project Name

Project Name	Gear Type	Number Each:	Gear Details
Grugan Gathering System Phase 2	Snake Hook/Tongs		
Grugan Gathering System Phase 2	VES (visual encounter surveys)		
Proposed Mine 44	Hand Capture (Search-And-Sieze)		
Proposed Mine 44	Snake Hook/Tongs		
Proposed Mine 44	VES (visual encounter surveys)		
Proposed Mine 47	Hand Capture (Search-And-Sieze)		
Proposed Mine 47	Snake Hook/Tongs		
The Sproul Trunk Line	Coverboards		
The Sproul Trunk Line	Snake Hook/Tongs		
The Sproul Trunk Line	VES (visual encounter surveys)		

PENNSYLVANIA FISH AND BOAT COMMISSION
LICENSE DOCUMENT

CLICK ON THE PRINT BUTTON TO PRINT YOUR LICENSE
After printing, close this window [x] and select "Return Home" or "Print Receipt"

Your license is printed below. To legally use your license, you must follow these instructions:

1. Sign your license. Licenses are not valid until signed.
2. Cut along the outside border (dotted lines) of the license, then fold as indicated. (Note: Should you choose to laminate your license document, you MUST ensure that BOTH sections of the license are visible for display to a law enforcement officer.)
3. Display this license on an outer garment while you are participating in the activity covered by the license and provide it to a law enforcement officer upon request. You are strongly encouraged to carry photo identification in addition to your license, as law enforcement officers may require additional identification during routine license checks.
4. State law prohibits you from borrowing or loaning this license to anyone.
5. State law prohibits you from altering, modifying or changing any information contained on this document by any electronic means.

CUT HERE

PENNSYLVANIA FISHING LICENSE
This side must be displayed on an outer garment.

10

NON-RESIDENT

SIGNATURE _____
License Not Valid Until Signed

My signature certifies under penalty of law, the information contained on this license is true and correct.
PENNSYLVANIA FISH & BOAT COMMISSION

Issued: 04/08/2010 14:04 Agent: 000886 Trans: 004473763 Terminal: 4812215

FOLD HERE

CID#: 015-607-229

Exemption #6 - Privacy [redacted]

102 NON-RESIDENT ANNUAL

NON-REFUNDABLE - F081403GF0NM54
EXPIRES 12/31/10 UNLESS OTHERWISE NOTED

Issued: 04/08/2010 14:04 Agent: 000886 Trans: 004473763 Terminal: 4812215

CUT HERE

PENNSYLVANIA FISH AND BOAT COMMISSION
LICENSE DOCUMENT

CLICK ON THE PRINT BUTTON TO PRINT YOUR LICENSE
After printing, close this window [x] and select "Return Home" or "Print Receipt"

Your license is printed below. To legally use your license, you must follow these instructions:

1. Sign your license. Licenses are not valid until signed.
2. Cut along the outside border (dotted lines) of the license, then fold as indicated. (Note: Should you choose to laminate your license document, you MUST ensure that BOTH sections of the license are visible for display to a law enforcement officer.)
3. Display this license on an outer garment while you are participating in the activity covered by the license and provide it to a law enforcement officer upon request. You are strongly encouraged to carry photo identification in addition to your license, as law enforcement officers may require additional identification during routine license checks.
4. State law prohibits you from borrowing or loaning this license to anyone.
5. State law prohibits you from altering, modifying or changing any information contained on this document by any electronic means.

Exemption 6 - Privacy

CUT HERE

PENNSYLVANIA FISHING LICENSE
This side must be displayed on an outer garment.

10

NON-RESIDENT

SIGNATURE _____
License Not Valid Until Signed

My signature certifies under penalty of law, the information contained on this license is true and correct.
PENNSYLVANIA FISH & BOAT COMMISSION

Issued: 04/13/2010 16:59 Agent: 000886 Trans: 004530401 Terminal: 4812215

FOLD HERE

CID#:016-436-909

[redacted]

102 NON-RESIDENT ANNUAL
150 TROUT/SALMON PERMIT

NON-REFUNDABLE - F131659JF0NC81
EXPIRES 12/31/10 UNLESS OTHERWISE NOTED

Issued: 04/13/2010 16:59 Agent: 000886 Trans: 004530401 Terminal: 4812215

CUT HERE

PENNSYLVANIA FISH AND BOAT COMMISSION
LICENSE DOCUMENT

CLICK ON THE PRINT BUTTON TO PRINT YOUR LICENSE
After printing, close this window [x] and select "Return Home" or "Print Receipt"

Your license is printed below. To legally use your license, you must follow these instructions:

1. Sign your license. Licenses are not valid until signed.
2. Cut along the outside border (dotted lines) of the license, then fold as indicated. (Note: Should you choose to laminate your license document, you MUST ensure that BOTH sections of the license are visible for display to a law enforcement officer.)
3. Display this license on an outer garment while you are participating in the activity covered by the license and provide it to a law enforcement officer upon request. You are strongly encouraged to carry photo identification in addition to your license, as law enforcement officers may require additional identification during routine license checks.
4. State law prohibits you from borrowing or loaning this license to anyone.
5. State law prohibits you from altering, modifying or changing any information contained on this document by any electronic means.

CUT HERE

PENNSYLVANIA FISHING LICENSE
This side must be displayed on an outer garment.

10

NON-RESIDENT

SIGNATURE _____
License Not Valid Until Signed

My signature certifies under penalty of law, the information contained on this license is true and correct.
PENNSYLVANIA FISH & BOAT COMMISSION

Issued: 04/27/2010 15:07 Agent: 000886 Trans: 004720327 Terminal: 4812215

FOLD HERE

CID#:019-162-817

Exemption 6 Privacy [redacted]

102 NON-RESIDENT ANNUAL

019162817

NON-REFUNDABLE - F271507SF0NK77
EXPIRES 12/31/10 UNLESS OTHERWISE NOTED

Issued: 04/27/2010 15:07 Agent: 000886 Trans: 004720327 Terminal: 4812215

CUT HERE

PENNSYLVANIA FISH AND BOAT COMMISSION
LICENSE DOCUMENT

CLICK ON THE PRINT BUTTON TO PRINT YOUR LICENSE
After printing, close this window [x] and select "Return Home" or "Print Receipt"

Your license is printed below. To legally use your license, you must follow these instructions:

1. Sign your license. Licenses are not valid until signed.
2. Cut along the outside border (dotted lines) of the license, then fold as indicated. (Note: Should you choose to laminate your license document, you MUST ensure that BOTH sections of the license are visible for display to a law enforcement officer.)
3. Display this license on an outer garment while you are participating in the activity covered by the license and provide it to a law enforcement officer upon request. You are strongly encouraged to carry photo identification in addition to your license, as law enforcement officers may require additional identification during routine license checks.
4. State law prohibits you from borrowing or loaning this license to anyone.
5. State law prohibits you from altering, modifying or changing any information contained on this document by any electronic means.

CUT HERE

PENNSYLVANIA FISHING LICENSE
This side must be displayed on an outer garment.

10

NON-RESIDENT

SIGNATURE _____
License Not Valid Until Signed

My signature certifies under penalty of law, the information contained on this license is true and correct.

PENNSYLVANIA FISH & BOAT COMMISSION

Issued: 04/30/2010 09:04 Agent: 000886 Trans: 004735067 Terminal: 4812215

FOLD HERE

CID#:019-197-698

[redacted]

Exemption 6 - Privacy

102 NON-RESIDENT ANNUAL

NON-REFUNDABLE - F300904NF0NJ84
EXPIRES 12/31/10 UNLESS OTHERWISE NOTED

Issued: 04/30/2010 09:04 Agent: 000886 Trans: 004735067 Terminal: 4812215

CUT HERE

APPENDIX G

LITERATURE CITED

Casper, G.S., T.G. Anton, R.W. Hay, A.T. Holycross, R.S. King, B.A. Kingsbury, D. Mauger, C. Parent, C.A. Phillips, A. Resetar, and R.A. Seigel. In prep. Recommended standard survey protocol for the eastern massasauga, *Sistrurus catenatus catenatus*. Draft sub. to Herp Review, February 2000. 10 pp.

Johnson et al. 2000. The Eastern Massasauga Rattlesnake: A Handbook for Land Managers. U.S. Fish and Wildlife Service, Fort Snelling, MN 55111-4056 52 pp. + appdx.

Pennsylvania Fish and Boat Commission, Natural Diversity Section. *Guidelines for Eastern Massasauga Rattlesnake Surveys* . June 2005. 3 pp.

Pennsylvania Fish & Boat Commission

established 1866

Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823-9620
July 29, 2010

IN REPLY REFER TO
SIR# 33499

Richard G. Tote
THE EADS GROUP
15392 ROUTE 322
CLARION, PA 16214

RE: Secondary Species Impact Review (SIR) #33499
GLACIAL SAND AND GRAVEL MINE 47/RODGERS PLANT
SMP #10070304
Worth Township, Butler County, Pennsylvania

Dear Mr. Tote:

The staff of the Natural Diversity Section reviewed your recent correspondence regarding the above-referenced project and its potential to adversely impact the eastern massasauga rattlesnake, (*Sistrurus catenatus catenatus*), Pennsylvania endangered.

You recently submitted a report for massasauga presence/absence surveys led by Dr. Glen Johnson in 2008 and 2010. According to the information provided, 6.5 acres of potential massasauga habitat was found and surveyed during appropriate seasonal and climatic conditions in 2010, but no eastern massasauga were detected. We concur with the report's conclusion – presently, eastern massasauga rattlesnakes do not exist at these wetlands.

Provided that best management practices are employed and strict erosion and sedimentation controls are used, I do not foresee the proposed project resulting in adverse impacts to the eastern massasauga rattlesnake or any other rare or protected species under Pennsylvania Fish and Boat Commission jurisdiction. Note that this office performed no field inspection of the project area. Consequently, comments in this letter are not meant to address other issues or concerns that might arise concerning matters under Pennsylvania Fish and Boat Commission jurisdiction or that of other authorities. Thank you for your cooperation and attention to this matter of endangered species conservation.

Sincerely,

Christopher A. Urban, Chief
Natural Diversity Section

CAU/KDG/mr

c: S. Kepler, PFBC
Chris Yeakle, DEP

rec 8/3/2010

RESPONSE TO DR. PATRICK A. BURKHART'S LETTER

The groundwater contour map that Dr. Patrick A. Burkhart provided to the U.S. Army Corps of Engineers (Corps) includes static water levels from Wells # 1, 2 and 4 and are included in his interpretation of the system supporting Wetland #1. Wetland #1 is supported by a shallow groundwater system and the static water levels in Wells # 1, 2 and 4 are not representative of the shallow groundwater system which supports the wetlands in question. To the contrary, these wells were drilled and cased through the sand and gravel and represent the regional system associated with the Kittanning and Homewood Sandstones. The pump test conducted in April 2010 on MW #1, confirmed there was no communication between this well, Monitoring Well # 5, Wetland # 2 or Wetland #1. In addition, the mapping Dr. Burkhart provided did not include the Unnamed Tributary (UNT #3) to Black Run on the south side of West Liberty Road which is a direct conduit for the shallow groundwater flows from Wetland #2. The flow system of the shallow groundwater precludes traversing West Liberty Road north "through" the Esker to Wetland #1. We, therefore, do not agree with Dr. Burkhart's assessment of the groundwater movement from the south to the north in this area. As previously stated and from the surface hydrology at the site, the predominant groundwater movement is oriented more east to west with the Esker acting as a natural topographic divide between the two flow systems.

We concur that there are areas south of West Liberty Road which provide some recharge to Wetland #1. However a majority of those areas are outside of the proposed mining limits. As we stated in our original report, 1-1.5% of the total recharge to Wetland #1 comes from beneath the Esker itself. Since the mining will not extend below the water table in this area, the natural groundwater flow regime will remain intact in this area assuring that there is no interruption to the quality or quantity of the supporting hydrologic system at the site.

It was not our intent to dispute the hydrology or geomorphic nature of Tamarack Lake and Wetland #1, but to point out that the historical record of landuse for the area is varied and the impacts, both natural and manmade, are not a static system, but one that is constantly in flux. The natural evolution over time of geomorphic systems is part of the geologic processes regardless of their origination.

It is not within our purview to debate the mining of the esker and we will therefore not comment further.

Finally, we note that the original hydrology report was reviewed by Jessa Corton CELRP of your office, who concurred with our original findings. The second groundwater pump test and report was reviewed by PA Department of Environmental Protection (DEP) Northwest Regional Office and they have concurred with our conclusions that there will be no impact to Wetland #1, #2 Tributary # 1 and #3 as a result of the pumping of MW # 1 at the Rodgers Plant Facility.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHWEST REGIONAL OFFICE

June 7, 2010

Mr. Richard G. Snyder, President
Glacial Sand and Gravel Company
P.O. Box 1022
Kittanning, PA 16201

Re: Glacial Sand and Gravel, Company
Rodgers Plant Site PAG2-0010-08-011
Mine 47 Surface Mine Permit Application No. 10070304
Worth Township, Butler County

Dear Mr. Snyder:

This letter is in response to the following submissions:

- January 4, 2010, letter from The EADS Group and the attached Rodgers Plant/Mine 47 Hydrology Report.
- May 3, 2010, letter from The EADS Group and the attached Mine 47/Rodgers Plant 48 Hour Pump Test Report.

This office reviewed these submissions with regard to potential impacts using Monitoring Well No. 1 (MW No. 1) as a production well might have on wetlands, surface streams and groundwater resources within or adjacent to the Rodgers Plant facility. Our review of these submissions was limited to only the Rodgers Plant facility. This letter does not constitute any determination concerning the above reference Surface Mining Permit application.

The Department concurs with conclusions of the May 3, 2010, report, that Wetland No. 1 and Wetland No. 2 and Tributary No. 1 and Tributary No. 3 will not be adversely impacted by the pumping of MW No. 1 as a production well, used to supply water to the sand and gravel processing plant. These submissions indicate that the operation of MW No. 1 at a 50 gallon per minute "gpm" rate for non-potable supply water to the Rodgers Plant is protective of the local groundwater resources.

The Department request as set forth in our December 2, 2009, letter that using MW No. 1 as a production well should not commence is withdrawn. Glacial Sand and Gravel Company may commence using MW No. 1 at a 50 gpm rate for non-potable water supply well to the Rodgers Plant.

This letter does not relieve the applicant from applying for and obtaining any and all additional permits or approvals from local, state or federal agencies for the construction activity described in the permit application.

If you have any questions, please contact me by e-mail at patrwillia@state.pa.us or by phone at 814.332.6155.

Sincerely,

Patrick G Williams

Patrick G Williams, P.E.
Acting Regional Manager
Watershed Management

cc: Butler Conservation District
Worth Township
Michal Jones-Stewart, P.G., The EADS Group
Lori Odenthal Knox Mining Office
Joe Lichtinger/Jason Shoemaker
Permit File

PGW:lsl

Michal Jones

From: Corton, Jessica D CELRP [Jessica.D.Corton@usace.army.mil]
Sent: Friday, January 29, 2010 12:45 PM
To: mjones@eadsgroup.com
Cc: Bintrim, Tyler J LRP
Subject: Mine 47 Hydrology

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Red Category

Michal,

I have finished reviewing the hydrology report for Mine 47. Based on the information provided, I believe there will little to no impact on the downstream tributaries and Wetland #1 as your report states. However, I noticed that cross section C-C' does not include MW-5. This monitoring well lies directly on the cross section. Including the boring log would be very beneficial to understanding the subsurface profile. Since the public will have the chance to review this information again, I am recommending this log to be included on the cross section.

Please let me know if you have any questions or comments.

Jessa Corton
US Army Corps of Engineers
Pittsburgh District
EC-DS
412.396.7547
412.396.7109 fax
Pittsburgh USACE (links): Webpage & Twitter
Water Safety for Kids (link): Bobber