

APPENDIX 2.5 - Response to FOTC Comments



Daniel Sammarco, P.E.
District Mining Manager
Rock Martin, P.G.
Permit Chief
Cambria District Mining Office
Pennsylvania Department of Environmental Protection
286 Industrial Park Road
Ebensburg, PA 15931

RE: Draft NPDES Permit No. PA0223239 (Mining Permit No. 01930302); Specialty Granules, LLC;
Response to Public Comments

Dear Mr. Sammarco and Mr. Martin:

Specialty Granules, LLC (“SGI”) would like to provide to the Pennsylvania Department of Environmental Protection (“PaDEP” or “Department”) responses to certain public comments submitted concerning the proposed renewal of NPDES Permit No. PA0223239 (the “NPDES Permit”), governing discharges to Toms Creek from the Pitts Pond System at SGI’s Charmian Quarry in Hamiltonban Township, Adams County. In specific, we are in this letter providing responses to (1) certain comments submitted by Fair Shake Environmental Legal Services on behalf of the Friends of Toms Creek (“FOTC”) by letter to you dated February 29, 2016 (“FOTC I Comments”); (2) the Fair Shake letter dated April 29, 2016 (the “FOTC II Comments”); and (3) certain public comments provided orally at the May 23, 2016 public meeting on the NPDES Permit renewal at the Fairfield Firehall (the “Public Meeting Comments”). Many of the issues raised in these comments were addressed in the multiple submissions that comprise SGI’s application for renewal of the NPDES Permit, and it is not our intention to repeat all of that information. However, we believe it is important to correct a number of misperceptions and misstatements in those comments concerning SGI’s operations and what is being proposed as part of the renewal of the NPDES Permit.

- 1. The discharge authorized by the proposed NPDES Permit renewal does not involve any new, additional or increased discharge, and thus does not trigger the requirement for antidegradation analysis as claimed by the FOTC Comments.**

Throughout the FOTC I Comments and in the FOTC II Comments, FOTC alleges that the antidegradation analysis is deficient. What FOTC fails to recognize, however, is that the proposed NPDES Permit does not involve any new discharge, additional discharge, or increased discharge, and therefore does not trigger the requirement for antidegradation analysis under 25 Pa. Code Ch. 93. As explained in detail in SGI’s submission to the Department dated March 25, 2015, 25 Pa. Code § 93.4c(b)(1)(i) provides that a “person proposing a *new, additional or increased discharge* to High Quality or Exceptional Value Waters” must comply with antidegradation requirements. (Emphasis added).

PaDEP’s *Water Quality Antidegradation Implementation Guidance* (Nov. 29, 2003) (“*Antidegradation Guidance*”)¹ in Chapter 7 defines “new,” “additional” and “increased” discharges as follows:

New Discharge. A wasteload not previously present on that waterbody that requires the construction/placement and permitting of a new treatment facility.

Additional Discharge. Flow and/or loading added to an existing waste stream that would not require construction to accommodate the added waste flow.

¹ <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.

Increased Discharge. Flow and/or loading added to an existing waste stream that would require new construction to accommodate the increased waste flow.

The current version of the NPDES Permit was issued in 2009. That existing permit authorizes the discharge from Pitts Pond #1 via Outfall 001 and from Pitts Pond #2 via Outfall 002. Although there have been improvements in the erosion and sedimentation control facilities and methods of operation in the Pitts Pond System since issuance of the last NPDES Permit and additional improvements proposed by SGI in this renewal, none of those changes or improvements have been required by any new wasteload not previously present, nor involved a new, increased or additional discharge to Toms Creek. Rather, such changes have resulted in a decreased frequency and volume of any discharges to Toms Creek. Notably:

- Pitts Pond #2 has been designed to hold and handle all flow from its drainage area up to and including a 100-year storm (6.4-inches in a 24-hour period), allowing collected flows to be pumped over to the three treatment pond system located in the Miney Branch watershed, which is not a special protection water.
- Pitts Pond #1 has been designed to hold and handle all flow from its drainage area up to and including a 10-year storm event (4.8-inches in a 24-hour period), allowing collected flows to be pumped over to the three pond treatment system. With the pumps operating, the pond can hold greater than a 25-year storm event (5.1-inches in a 24-hour period), collecting that flow and transferring it to the three pond treatment system.
- Except during extraordinary hydrologic conditions, the combined flows into Pitts Pond #1 and #2 are managed via pumping those volumes to the three pond system, avoiding discharges to Toms Creek.
- Due to the improvements to the pumping system and implementation of proactive water management procedures to control and minimize discharges to Toms Creek, during the past five years there have been no discharge events from the Pitts Pond system via Outfall 001 or Outfall 002. The last discharge event occurred during extraordinary back-to-back large storms in March 2011. Notably, in May 2014, the site received and managed a 10-year/24-hour storm without any discharge to Toms Creek. The further improvements made since 2011 and proposed as part of our pending permit application would further reduce the frequency and duration of any discharges.
- Under the terms of the proposed renewal of the NPDES Permit, discharges to Toms Creek would only potentially occur from Outfall 001 during precipitation events which are the equivalent of a 10-year, 24-hour storm or greater, and during such discharges, the TSS concentrations in the water discharged from Pitts Ponds #1 and #2 would be required to be equal to or better than the water quality of the receiving stream.

In its March 27, 2015 submission, SGI provided calculations showing the frequency and volume of discharges to Toms Creek, comparing 2009 conditions under the existing NPDES Permit to the conditions proposed in the NPDES Permit renewal application. As seen from those calculations, in every modeled scenario (no rainfall, a 2-year/24-hour storm, a 10-year/24-hour storm, and a 100-year, 24-hour storm), the discharge to Toms Creek under the proposed NPDES Permit renewal is equal to or lower than under

the existing NPDES Permit. For these reasons, the antidegradation requirements of 25 Pa. Code §93.4c(b)(1)(i) are not triggered.

Going beyond the regulatory requirements, SGI submitted information to the Department, following the antidegradation supplement for mining and additional narrative, and explained in some detail the non-discharge alternatives that have been evaluated, and how the combination of measures that have been implemented qualify as the Antidegradation Best Available Combination of Technologies (referred to as ABACT). Those ABACT best management practices include: (1) sizing sediment basins with excess capacity well above ABACT BMP criteria; (2) designing both Pitts Ponds with 4 to 7 days detention time or greater; (3) providing for pumping of stormwater from all but the largest storm events over to the three pond system as an alternate discharge to a non-special protection watershed; (4) utilizing vegetated riparian buffers and using permanent vegetation or rock lining on all drainage channels; (5) providing for reuse of stormwater in the industrial process and as dust suppression; (6) using vegetated swales where possible and preserving adjacent lands, notably the 15.5 acres parcel to the north known as the former Warner Parcel; (7) reduction of the amount of stormwater runoff entering the collection system in some areas and returning that stormwater to the watershed; (8) continuing and expanding a robust water quality monitoring program; and (9) adopting a proactive stormwater management protocol for monitoring rainfall and controlling stormwater runoff, so as to control potential rare discharges to Toms Creek so that they occur only during extraordinary rainfall conditions.

Coupled with those measures, the proposed NPDES permit renewal imposes a condition that requires that in those rare instances where discharge would occur from the Pitts Pond system, the level of turbidity (suspended solids) in the water discharged must be equal to or better than the receiving stream. The point here is clear. In any storm, all streams experience some increased turbidity from runoff across the land, but under Special Condition 4, on page 12 of the proposed permit, SGI must monitor both the discharges and instream water quality in the receiving tributaries of Toms Creek, and total suspended solids (TSS) in the discharge must not exceed TSS measured at monitoring point SS9, upstream of the discharge.

- 2. Contrary to FOTC's claims, the Department did not incorrectly label a point source discharge as a non-discharge alternative; SGI's application and the Department's NPDES Permit fact sheet clearly identify that Pitts Pond 1 and 2 will discharge on rare occasions under extreme storm conditions and explain why a non-discharge alternative is not practicable.**

The FOTC Comments assert that the Department has "incorrectly applied the antidegradation regulations by labeling a point source as a non-discharge alternative." FOTC Comments I at pg. 5. Setting aside the point that antidegradation requirements are not triggered by this NPDES Permit renewal, since there is no new, additional or increased discharge (see §1 above), FOTC's assertion is flat wrong. The Department's NPDES Draft Permit Fact Sheet on page 2 clearly explains that "[l]imited area on the site, geologic conditions, and amounts of water involved with the operation prevent the permittee from devising any non-discharge facilities on the site." Standing behind this statement is the analysis provided in SGI's March 27, 2015 submission. SGI's submission contained not only an "Anti-Degradation Supplement for Mining Permits" form with Section 1 filled out, but also an extended narrative which provided an evaluation of the feasibility of a series of non-discharge alternatives, including alternative siting, alternative discharge locations in another non-special protection watershed, infiltration, limiting disturbed areas, on-site water reuse, constructed treatment wetlands, holding facilities and/or wastewater hauling, injection, riparian buffers, and pollution prevention processes. As explained in that narrative, while many elements of those alternatives have been adopted and implemented as part of SGI's operation, there is no feasible non-discharge alternative that can achieve

complete non-discharge at this facility. However, a combination of existing and planned alternatives described have resulted in implementation of many best management practices that collectively create a near non-discharge facility, and enable reduction from the previously permitted volume, rate and concentration of pollutants in stormwater runoff. Moreover, as explained in the narrative provided in the March 27, 2015 submission, those measures that have been implemented qualify as ABACT.

3. SGI submitted detailed information to characterize the quality of water that may be discharged from Pitts Ponds 1 and 2, sufficient for the Department to render an appropriate reasonable potential assessment.

FOTC alleges that the Fact Sheet does not provide sufficient explanations and information for the Department's reasonable potential assessment, and goes on to suggest that the applicant failed to present data to properly characterize the discharge. FOTC Comments I at pg. 4. Similarly, one commenter at the May 23 public meeting suggested that SGI may be withholding information regarding the presence of contaminants, including radioactive materials, in its discharge. A reading of the SGI application shows the contrary. In its application submission, SGI completed Section D (Effluent Characteristics), and provided analytic results for a wide range of constituents, including measures of radioactivity (which were not detected). A chemical data summary was provided in Attachment 4. Given those analytic results, which show many parameters as non-detect, and others well below Ch. 93 instream water quality criteria, the Department judgment that there is no potential of the discharge of significant amounts of toxic substances or nutrients is well justified, and there is no mandate that the Department conduct an analysis for assimilative capacity, aquatic life or degradation of current water quality. Here again, we note that absent a new, additional or increased discharge, the anti-degradation requirements are not triggered. Finally, the proposed monitoring program will provide protection of water quality in Toms Creek by not allowing discharge of stormwater with TSS greater than that present in the upstream location during any potential rare discharge event.

4. Sufficient information exists to support the Department's finding that the aquatic life narrative water quality standard is satisfied.

FOTC claims that the permit and Fact Sheet do not contain supporting information to assure that aquatic life is adequately protected, and asserts that the Department should summarize the evaluation and measures taken to prevent "violation of the Aquatic Life narrative Water Quality Standard." FOTC Comments I at 4.

First, nothing in the pertinent regulations requires that a fact sheet recite all of the data or evaluations conducted. The public notice requirements of the Department's water quality regulations do not require issuance of a fact sheet; they only require a statement of the tentative determination to issue the NPDES permit, the proposed effluent limitations, and a brief description of any proposed special conditions that will have a significant impact upon the discharge, and the rate and frequency of the discharge. See 25 Pa. Code §92a.82(b). The Department's public notice in this case met all such requirements.

FOTC's claim appears to refer to the general water quality criteria found in 25 Pa. Code §93.6(a), which states: "Water may not contain substances attributable to point or nonpoint source discharges in concentrations or amount sufficient to be inimical or harmful to the water uses to be protected or to

human, animal, plant or aquatic life.” FOTC challenges the Department’s conclusion that stream concentrations of total dissolved solids (TDS) and sulfate are low and not elevated, but fails to offer any contrary evidence.

What FOTC refers to as the aquatic life narrative standard looks to whether the discharge will contain concentrations that are harmful or inimical to aquatic life. As to the parameters mentioned in FOTC’s comments, the concentrations of sulfates and TDS in the Pitts Pond water are reported in Attachment 4 to the NPDES Permit application. TDS and sulfate are naturally occurring water quality parameters that are subject to secondary drinking water standards under EPA regulations, which are for aesthetic purposes only. Those recommended secondary standard limits for drinking water are 250 mg/L for sulfate and 500 mg/L for TDS. PaDEP has adopted these concentrations as surface water quality standards in 25 Pa. Code §93.7. The sampled sulfate and TDS concentrations set forth in Attachment 4 to SGI’s application are 13.9 mg/L and 210 mg/l, respectively, well below these limits. Both of these constituents and their measured concentrations in the sample taken from Pitts Pond are also well within naturally occurring ranges in surface waters in healthy watersheds, and do not represent concentrations that are harmful or inimical to aquatic life.

- 5. The proposed NPDES Permit renewal does not just depend on technology based effluent limitations; it sets a TSS limitation on discharges from Pitts Ponds 1 and 2 (which will only occur in storms greater than a 10-year/24-hour event) requiring that “effluent must meet instream concentrations”, thus protecting instream water quality even during extreme storm events.**

In alleging that the draft Permit only sets technology-based effluent limits, the FOTC Comments wholly mischaracterize the meaning and import of the limits set on discharges from Pitts Ponds 1 and 2 to Toms Creek. As noted above, discharges from Pitts Ponds 1 and 2 will only occur in extreme storm events, exceeding the equivalent of a 10-year/24-hour storm. In this setting, the draft renewal NPDES Permit imposes a limitation on TSS requiring that the discharges from Pitts Ponds 1 and 2 meet instream concentrations for any storm event or when discharging for any other reason. The draft NPDES Permit sets up a monitoring program involving the two outfall points plus six (6) points up and downstream of Outfalls 001 and 002, and requires that the water discharges from the Pitts Ponds have TSS concentrations equal to or less than those at monitoring point SS-9, upstream of the discharge. Thus, with respect to the parameter of significance with respect to management of stormwater runoff from mined areas, the proposed NPDES permit mandates discharges with concentrations no higher than monitored instream conditions. If the discharge water quality must be equal to or better than the receiving stream, it is hard to see how FOTC can argue that any degradation will occur.

- 6. FOTC’s professed concern regarding potential temperature impacts of SGI’s rare discharges during extreme storm events is baseless.**

FOTC make several mentions of a professed concern relating to temperature impacts on SGI’s Pitts Pond discharges, and claims that no thermal evaluation was conducted. FOTC Comments I at 8-10.

The point that FOTC misses is that the discharge from the Pitts Ponds to Toms Creek will only occur during extreme storm events, when precipitation and runoff exceed the equivalent of a 10-year, 24-hour storm.

During extreme storm events, the temperature of the naturally flowing water in Toms Creek will be dominated by runoff from across the land throughout the watershed, and will be consistent with the temperature of that rainfall (which may be cool in the spring and warmer during the summer and fall). Likewise, the temperature of water entering and exiting the Pitts Pond system during a large storm event will be dictated by the temperature of the precipitation falling in the area. Also, during the course of such storm events, the cloud cover that accompanies such storms precludes significant thermal inputs to the temperature of stormwater which may be temporarily stored in the Pitts Ponds. In a **rare** storm event large enough to engender a discharge from Pitts Ponds, the temperature of the water flowing across all land in the watershed, including across SGI's land, will be for all practical purposes the same.

This is quite different than the situation discussed in the Pennsylvania Stormwater Best Management Practices Manual, Document No. 363-0300-002 (April 2006), which warns about potential thermal concerns with extended detention and sedimentation removal impoundments, where stormwater is stored for significant periods after the storm passes, and water within the impoundment is exposed to sunlight and warm air for potentially many days or weeks. SGI's Pitts Ponds are **not** extended detention basins. Rather, the Pitts Ponds are designed to capture and hold stormwater for a limited period of time before being pumped over to the three pond system. Under normal precipitation conditions and assuming no pumping, the Pitts Ponds provide a minimum of 4 to 7 days detention time for sediment settling and exceed PaDEP design criteria for sediment ponds in HQ watersheds. However, the Pitts Ponds are not managed for that purpose prior to potential discharge events. Under SGI's proactive water management plan, weather conditions and predictions are monitored and prior to a **rare** major storm of the type that could potentially result in a discharge, the Pitts Ponds will be pumped intentionally lower than necessary in order to provide even greater storage capacity. This dewatering process can be accomplished in less than six hours, and ensures that any discharge to Toms Creek is comprised primarily of fresh runoff that is of a similar temperature as the water in Toms Creek, which would also be dominated by runoff in the watershed. Only in circumstances where the pond capacity is reached (greater than 10-year/24-hour storm at Pitts Pond 1, and 100-year/24-hour storm for Pitts Pond 2), and the pumping rate is exceeded by inflow to the Pitts Ponds can there be a discharge, at which point the effective detention time within the Pitts Ponds is minimal and by definition in the permit is less than 24 hours after the storm event, and thereby any potential for thermal mixing and potential thermal impacts within that timeframe is minimal. After the major storm period, the water within those ponds is not held and discharged to Toms Creek, but rather is pumped over to the three pond system for settlement and reuse, with only the excess being discharged to Miney Branch.

7. FOTC's claimed concerns regarding increased sediment loading appear to be unfounded.

FOTC alleges that the Department has not adequately evaluated whether increased sediment will degrade water quality or impair uses. FOTC Comments I at 11. FOTC's concern is based upon a false premise, because SGI's application and the NPDES permit do not propose an increased sediment loading.

As emphasized above, and explained in detail in SGI's application, what SGI has proposed are improvements that reduce the frequency of discharges to Toms Creek, and in the process reduce the volume of water discharged and amount of any resulting sediment discharged to the stream. At the

same time, the proposed NPDES permit sets a TSS limit that restricts TSS concentrations in water discharged from Pitts Ponds 1 and 2 to be less than or equal to the instream concentration.

- 8. Even if a discharge from Pitts Pond in the rare, extreme storm event were to have some impact to Toms Creek water quality, that impact would be minor and temporary and, although not applicable, would be overwhelmingly warranted by social or economic justification (“SEJ”).**

In 1994, the Department issued this NPDES permit based in part on an SEJ analysis. While an SEJ analysis is not required as part of this permit renewal process, social and economic considerations still overwhelmingly favor the renewal of the NPDES permit. If anything, the SEJ analysis has become more favorable to SGI since 1994, as potential impacts to the stream have decreased over time and social and economic benefits have increased, as explained in the following subsections.

8.1 Any impact of a discharge during a rare, extreme storm event would be minor, temporary, and consistent with the natural system of stormwater runoff.

The mine that is the subject of this permitting action has been operating since 1923, and SGI has been permitted to discharge to Toms Creek since 1968. Despite 48 years of mining and discharges to Toms Creek, the Creek remains a High Quality stream due to outstanding planning and management of discharges by SGI. In fact, FOTC and other public commenters are in agreement that, despite SGI’s historic discharges under prior versions of this NPDES permit, Toms Creek has, at the very least, maintained its status as a High Quality stream.

Unlike prior versions of this NPDES permit, the current permit is even more rigorous in that it contemplates discharges of only stormwater, containing no process water. Furthermore, discharges would only be permitted during rare high volume storm events, and the discharges could not exceed upstream TSS levels, as discussed in more detail above. The volume of any rare discharges under the proposed permit terms would represent a fraction of the runoff (<1%) that enters the stream during exceptional storm events, and would not have a dilutive effect on the receiving stream, nor will it be toxic to aquatic life. As discussed above, the temperature of the discharge will be equivalent to contemporaneous stormwater runoff. Retention basins and other E&S controls used at the facility are all well known, reliable technologies. Notably, in May 2014, the site received and managed a 10 year/24-hour storm without any discharge to Toms Creek.

In sum, based on SGI’s proven record of protecting Toms Creek, together with the more stringent proposed permit terms and conditions, there is no reason to believe that SGI’s proposed discharges would cause anything more than minor or temporary impacts to Toms Creek.

8.2 Any minor or temporary impacts would be warranted by social and economic considerations.

SGI’s Charmian mining operation in Pennsylvania is a one-of-a-kind non-coal quarry, mining a competent metabasalt (greenstone) from the Catoctin Metabasalt formation with no underground or man-made conduits. The formation is 600+ feet and the acres to be mined under the Pitts permit are 121.5 acres.

Total tonnage to be mined is 94 million. The depth of the pit floor is permitted to elevation 820 feet amsl, and groundwater is not affected by the operation. Metabasalt is crystalline and inert and does not leach harmful chemical constituents or contribute acid pH or sulfur to stormwater runoff. This mineral is used to create roofing granules used on asphalt roofing shingles. The greenstone is of good quality and is unique in its competence, high compression strength, high bulk density, compositional uniformity, ability to hold colors, withstand a kiln firing process and long term endurance when exposed to weather on roofs over time on products with a lifetime warranty (50 years). There is a confirmed market and processing infrastructure for the metabasalt mined at this facility, and there are no other providers of this commodity within 20 miles. Nationwide, there are only approximately 10 quarries that produce granules suitable for asphalt roofing shingles. The Charmian facility produces enough granules to protect 1 million residential homes every year.

Toms Creek is a trout-stocked fishery and stocking is conducted approximately 2,000 feet north of the site by the PA Fish and Boat Commission. There are no special regulation areas, and the stream is not designated as a Wild Trout Water. No wetlands are affected and the stream does not support or provide critical habitat for threatened or endangered species. There is no public water supply intake within 10 miles downstream of the discharge, and as such there are no water quality impact or mitigation measures applicable.

The land uses in the area including the areas within 100-feet of the permitted area are unmanaged forest land and sparse residential. Hunting occurs in the surrounding area, but will not be impacted by the rare stormwater discharges that may occur under this permit renewal. The post-mining land use will return to unmanaged forestland as permitted by PaDEP, and the reclamation plan includes grading and vegetation that will provide habitat for wildlife and promote natural runoff/recharge conditions. This watershed was previously mined and has not been adversely impacted, as Toms Creek remains High Quality, and there are not currently and will not be abandoned mine land features related to this mining operation.

SGL is the owner and operator of the site and leases no mineral rights, and does not own mineral rights in the area other than this facility. There are other active mines in the watershed comprising less than 1% of the watershed, located immediately to the southwest discharging to Miney Branch. Less than 1% of the watershed will be disturbed by the proposed mining. The mining project has been in business since 1923. The quality of life of residents and visitors has improved over time as management standards have increased.

Approximately 150 employees work full time at the mine, with 175 employees during peak production. Approximately 98% of the employees reside in a 30 mile radius. Average annual wages is \$52,420, which is high-paying compared to the average Adams County wages of \$35,120 or Franklin County wages of \$37,100. The average facility employee has been with the facility for 17 years, with many second and third generation workers. There is no bond posted with the local municipality for road repair. The estimated taxes paid to the local economy annually are approximately \$275,000. This operation is key to the local tax base and is believed to be one of the largest contributors to Hamiltonban Township's tax base. Total wages and benefits from the operation is \$13.2 million (\$14.5 million at peak). The facility has 320 suppliers and supports 3,500 direct and indirect jobs. The post mining land assessment is expected to decrease as it will be forest land and not industrial. Because the mine has been in service

since 1924, renewal of this stormwater permit should have no effect on tourism or property values, and Toms Creek is and will remain a HQ stream.

Renewal of this permit is not anticipated to result in any adverse impacts to aquatic life or the water quality of Toms Creek. The social and economic benefits of a continued mining operation at this location includes 150 full-time high-paying jobs, tax revenue, economic vitality, and positive impacts to all homeowners with asphalt roofing shingles on their house. This permit renewal is a more stringent replacement of an existing permit and will have no additional adverse impacts to the region. Therefore, even if an SEJ analysis were required, the renewal of SGI's NPDES permit would clearly be justified considering all social and economic factors.

9. FOTC's claim that Toms Creek qualifies as "exceptional value" is premised on an incomplete and inadequate study that does not meet the criteria set forth in the Department's Water Quality Management Implementation Guidance.

Toms Creek is currently classified as a High Quality water under Pennsylvania's Ch. 93 water quality regulations, and SGI's permit application was appropriately evaluated in that light.

However, the FOTC II Comments now assert that Toms Creek "is actually Exceptional Value", premised on an eleven page report entitled *Exceptional Value Conditions in Tom's Creek Adams County, Pennsylvania*, dated April 27, 2016, prepared by Dr. Ben M. Stout (the "**Stout Report**"). A close examination of the Stout Report, however, reveals that the methodology used fails to meet the criteria for rendering an "existing use" determination as set forth in the Department's *Antidegradation Guidance*.

Pennsylvania's water quality regulations allow a stream to be classified as High Quality ("HQ") or Exceptional Value ("EV") on the basis of a "biological assessment qualifier" which compares benthic macroinvertebrate scores derived from the *Rapid Bioassessment Protocols ("RBP")* of the candidate stream to a properly selected reference stream and to properly screened data from a statewide database of EV streams. The Department's *Antidegradation Guidance* spells out that process in detail, explaining the numerous steps and criteria that must be applied to conduct surveys of reference and candidate streams in order to render a proper comparison determination. *Antidegradation Guidance* at 28–35, 37–38. That process requires much more than the Stout Report provides. The *Antidegradation Guidance* mandates:

- Identifying multiple sample locations on both the candidate and reference stream, and evaluating those locations for habitat characteristics (e.g., riffle/run or pool/glide habitat). *Id.* at 29.
- Selecting the most productive habitat locations on each of the candidate and reference streams. *Id.* at 29.
- The biologist must "match the natural conditions of a candidate with a reference. For example, a low gradient, soft substrate candidate stream should be matched with a similar reference, and not, for example, to a steep gradient, rocky substrate reference." *Id.* at 30.
- "[T]he single, most critical issue is the selection of reference sites. Care must be taken in selecting reference sites that have the same, or very similar, natural conditions as the candidate sites." *Id.* at 30. The candidate and reference streams must be of the same general type (i.e., freestone, limestone,

etc.), and of similar subcategories. *Id.* “The candidate and reference site must possess similar gradient and alkalinity and be of equal or similar stream orders or drainage areas.” *Id.*

- The reference stream must have attained its EV status using the biological assessment qualifier, and not some other EV-qualification criteria, such as being in a designated State park or forest natural area, or wilderness trout stream. *Id.* at 31.
- To prevent “dilution” of scoring, reference streams must be those EV waters that represent the “best attainable biological community”, which among others requires reference to the Department’s macroinvertebrate database. *Id.*
- To ensure that the most productive habitat is selected for sampling, the biologist must evaluate a set of twelve habitat parameters, and of those, the reference sampling station should achieve optimal scores for five metrics (epifaunal substrate, embeddedness, channel alternation, sediment deposition, and grazing/other disruptive factors). *Id.* at 32.

9.1 Deficiencies of the Stout Report

On the face of the Stout report, it is not apparent that any, let alone all, of these steps and criteria were followed:

- The Stout Report contains no information as to the identification and consideration of alternative sampling stations or how the three stations were selected. In fact, the Stout report states several reasons why the Ryerson EV stream is actually an inappropriate comparison and ignores the fact that it is in a very different geologic setting than Toms Creek as well as the fact that it was sampled about a month later, and concludes that the Ryerson comparison was included “because I sampled it anyway as part of a separate project....” Stout Report at 8.
- The Stout Report fails to provide information as to the geologic setting, topographic setting, stream gradient, hydrology, and habitat characteristics of both the candidate and reference stream stations, and does not come close to providing enough information regarding the reference reaches used to validate their use for this purpose. Based upon the locations of each sampling station provided in the Stout report, the drainage areas, stream gradients, and geologic settings of the candidate and reference streams are significantly different.
- As a function of these very basic differences between each sampling location, it is expected that natural water quality and aquatic habitat characteristics are also likely different, and inappropriate for comparison of these streams for the purpose intended in the Stout report. In addition, and since that report provides no habitat assessment data or other supporting data regarding these basic stream quality characteristics, the comparisons with Toms Creek and the two samples identified by Stout as EV reference reaches are certainly insufficient for the purpose of changing the existing use of Toms Creek.
- The Stout Report provides no information indicating that an evaluation was conducted to assure that the reference stream stations met the optimal scores for the five key in-stream habitat metrics allowing the stations to be considered as reference. No data are provided regarding epifaunal

substrate, embeddedness, channel alternation, sediment deposition, and grazing/other disruptive factors.

- The Stout Report does not provide any documentation of how or why the Carbaugh Run in Michaux State Forest or the UNT to North Fork Dunkard Fork in Ryerson Station State Park originally qualified as EV. As noted, the Department's *Antidegradation Guidance* mandates that only streams that qualified as EV based upon biological evaluations may be used as references, and those biological evaluations must be considered to avoid "dilution" of the designation criteria.
- The Stout Report presents glaringly deficient water quality data, relying on a one-time grab sample at one location for each site, using only a field meter. There is no description of how the sample was collected, and the sample collection date for one of the streams (Ryerson) was a month later than the other two. There are specific sampling methods and protocols that were not met by this study that are required for meaningful analysis of water quality for the purpose of stream classification.

One telling statement in the Stout Report is its candid admission that "[e]ach of the streams sampled had fairly different physical and chemical signatures" Stout Report at 5. The Stout Report further notes that Carbaugh Run station is not comparable, stating: "I was unable to sample Carbaugh Run in a more downstream location with a watershed area comparable to the watershed area of the Tom's Creek sampling site. Watershed area has a significant impact on the expected macroinvertebrate community." *Id.* at 8. Although the Stout Report lacks the information for a full comparison, these statements alone suggest that the reference streams used to benchmark results from Toms Creek fail to meet the *Antidegradation Guidance's* requirements for similarity between candidate and reference streams. At the very least, FOTC's claim that Toms Creek qualifies as EV cannot be sustained on the basis of the inadequate and incomplete Stout Report. That report simply cannot support an EV "existing use" determination.

9.2 Independent Field Assessment

Because the Stout Report contained insufficient detail to assess whether the reported evaluations and reference site selection were appropriate, SGI retained Dr. Tim Nuttle (Ph.D., Certified Senior Ecologist, Certified Wildlife Biologist), Mark Haibach (M.S., Professional Wetland Scientist), and Michael Davison (M.S., Certified Benthic Macroinvertebrate Taxonomist) of Civil & Environmental Consultants, Inc., ("**CEC**") to independently evaluate Toms Creek, Carbaugh Run, and Unnamed Tributary ("**UNT**") 32599 to North Fork Dunkard Fork.

The three CEC ecologists visited the three streams on May 31 and June 1, 2016. They collected data on the overall condition of the stream and its riparian area, collected field water chemistry data using a YSI meter, conducted an RBP Habitat Assessment for riffle/run dominated streams (PaDEP fpr, 3800-FM-BPNPSM0402 4/2012), and a pebble count to quantitatively evaluate substrate composition and embeddedness (corresponding to two of the five most important categories of the RBP Habitat Assessment, according to the *Antidegradation Guidance*). Based on GIS data, they also calculated watershed area, percent slope (gradient), road density, and percent forest composition in the watershed. Results of these field and GIS assessments are presented in Table 1.

Additionally, CEC obtained Macroinvertebrate Sample Summaries from PaDEP's Bureau of Point and Nonpoint Source Management for previous sample points on Toms Creek and Carbaugh Run. Field chemistry and RBP Habitat Assessment data from these summaries are also presented in Table 1.

Watershed characteristics: Toms Creek and Carbaugh Run are in the Potomac River Drainage whereas UNT 32599 to North Fork Dunkard Fork is in the Ohio River Drainage. Toms Creek at Stout's sample location (as described in the Stout Report) has a watershed area of 1,938 acres with a slope (gradient) of 1.3%. In contrast, both of Stout's "reference" stations have substantially smaller watershed areas and steeper gradients (253 acres and 3.2% for UNT 32599 and 314 acres and 5.7% for Carbaugh Run; Table 1). Road density (a potential source of sedimentation) is also substantially higher for the watershed above Stout's Carbaugh Run station. Parent material was primarily metabasalt for Toms Creek, metarhyolite for Carbaugh run, and sandstone for UNT 32599. Based on watershed area and percent gradient, neither UNT 32599 nor Carbaugh Run (at Stout's sample location) are appropriate references for his Toms Creek sample location. *Antidegradation Guidance* at 30 ("The candidate and reference site must possess similar gradient and alkalinity and be of equal or similar stream orders or drainage areas[.]"). CEC also evaluated Carbaugh Run downstream approximating the former PaDEP sample location. The watershed area and gradient of Carbaugh Run are more comparable to the Toms Creek location than either of Stout's comparison samples.

Field chemistry: Stout's Toms Creek sample location had a circumneutral pH and low conductivity. In contrast, Stout's sample location on Carbaugh Run had a substantially lower (more acid) pH and lower conductivity, while Stout's sample location on UNT 32599 had substantially higher (more basic or alkaline) pH and higher conductivity (Table 1). CEC's results largely parallel what is presented in the Stout Report for field chemistry. Note that temperatures between the CEC and PaDEP samples differ based on time of year; dissolved oxygen was similar between the various samples, other than as influenced by temperature. The *Antidegradation Guidance* makes no reference to conductivity, but notes (p. 31) that "[t]he pH of the reference and candidate streams should be within one pH unit." Based on this criterion, both Stout's reference stream sample locations would be disqualified because they are more than one pH unit different than what was measured at Toms Creek at Stout's sample location. Again, the CEC and PaDEP locations downstream on Carbaugh Run more closely match Stout's Toms Creek location.

Habitat and substrate assessment: CEC evaluated habitat at each of Stout's stations and an additional location on Carbaugh Run near PaDEP's station, according to the methods specified in the *Antidegradation Guidance*, supplemented by quantitative measurements of substrate composition and embeddedness. These quantitative measurements were based on a meandering survey of a 328-ft-long sample reach, wherein 100 samples of substrate were measured with a ruler and embeddedness was characterized for each particle as a percent embedded by sand, silt, or clay. CEC used these data to calculate percent of substrate in each substrate category, median particle size (D50), and the average embeddedness of the reach.

Overall, Stout's Toms Creek location had suboptimal habitat, and two of the five most important habitat metrics (embeddedness and sediment deposition) were in the marginal range, while another of these metrics (epifaunal substrate) was suboptimal. These qualitative assessments are verified by the sediment and embeddedness data, which show 18% sand and silt and 49% embeddedness.

Stout's Carbaugh Run sample location was also suboptimal overall; however, three of the five most important habitat metrics have disqualifying values below 16 (in bold in Table 1). According to the *Antidegradation Guidance* (p. 32): "A reference sampling station should achieve optimal scores (16 to 20) for the above five metrics." Furthermore, "[t]he biologist must also take into consideration the other seven habitat metrics and, if they score poorly (<10), disqualify the station as a reference, regardless of its biology." *Antidegradation Guidance* at 32. Marginal and suboptimal epifaunal substrate, embeddedness, and sediment deposition values for Stout's Carbaugh Run station are substantiated by a high proportion (27%) of sand and silt and a high value (46%) for embeddedness (Table 1). The marginal and suboptimal scores disqualify Stout's Carbaugh Run station as a valid reference sample location.

UNT 32599 was also suboptimal overall, with sediment deposition (one of the five most important habitat factors) being scored suboptimal. The suboptimal score for sediment deposition resulted from bank erosion within and upstream of the reach, evidenced by unvegetated and eroded areas along stream banks, mid-channel gravel bars, and braided channels. These factors suggest UNT 32599 was not sampled in the most biologically productive habitat, potentially disqualifying it as a reference. *Antidegradation Guidance* at 32.

Antidegradation calculations: Because PaDEP's Carbaugh Run sample was taken relatively contemporaneously with Stout's Toms Creek benthic sample, CEC performed calculations as described in 25 Pa. Code §93.4b(a)(2)(i) to see if Toms Creek would qualify based on this reference location (Table 2). Based on this analysis, Toms Creek, with a score of 75%, does not qualify as EV. Furthermore, CEC used this method to compare the macroinvertebrate results for Stout's Carbaugh Run location (from the Stout Report) with PaDEP's data collected downstream 15 days later. The score of 30% for Stout's sample compared to the PaDEP sample (Table 3) demonstrates that Stout's location does not adequately represent the biological potential of Carbaugh Run. Using this inferior location as a reference would dilute the reference stream values and artificially elevate Stout's calculations for Toms Creek by comparison.

Conclusion: On the basis of the independent field evaluation performed by CEC, neither of the two reference stream locations selected by Stout are valid references for EV determination, each having several disqualifying characteristics related to habitat and watershed/gradient characteristics. Furthermore, comparison of Stout's benthic data collected from Toms Creek with contemporaneous data collected by PaDEP at a reference location on Carbaugh Run show that Toms Creek does not qualify for EV status.

Table 1. Watershed, water chemistry, and habitat assessment data for Tom's Creek and potential reference locations (Table 1 footnotes appear at the top of the following page)

Stream	Tom's Creek		Carbaugh Run			UNT 32599
Station	Stout	PaDEP ^a	Stout	PaDEP ^b	CEC ^c	Stout
Sampled by (data in this table)	CEC	PaDEP	CEC	PaDEP	CEC	CEC
Sample date	5/31/16	11/24/14	5/31/16	4/8/16	5/31/16	6/1/16
<u>Watershed Characteristics</u>						
Watershed Area (acres)	1,938	2,465	314	3,814	3,814	253
% Slope at sample station	1.3	2.1	5.7	2.2	2.2	3.2
Road density (ft/acre)	11.7	12.6	37.6	21.4	21.4	7.2
% Forest	90	92	100	97	97	92
<u>Field Chemistry</u>						
Temperature (C)	17.2	8.1	13.9	6.7	17.9	17.2
Conductivity (µS/cm)	73	88	13	27	36	226 ^e
Specific conductance (µS/cm at 25C)	86	130	16	42	42	362 ^e
Dissolved Oxygen (mg/L)	9.5	10.9	10.5	11.5	9.6	10.2
pH (S.U.)	7.23	7.70	5.44	6.35	7.15	8.25
<u>RBP Habitat Assessment</u>						
Instream cover (fish)	14	19	10	20	18	11
<i>Epifaunal substrate^d</i>	13^d	19	10	20	20	16
<i>Embeddedness^d</i>	9	19	11	15	18	18
Velocity/depth regimes	10	19	10	20	16	10
<i>Channel alteration^d</i>	20	20	20	20	20	18
<i>Sediment deposition^d</i>	7	20	6	19	18	13
Frequency of riffles	18	19	16	20	20	18
Channel flow status	20	20	20	20	20	13
Condition of banks	12	19	10	15	20	11
Bank vegetation	18	20	16	16	20	13
<i>Grazing or other pressure^d</i>	20	20	20	20	20	18
Riparian vegetative zone width	20	20	20	20	20	17
Total Riffle/Run habitat score (optimal is 192 - 240)	181	234	169	225	230	176
<u>Quantitative Substrate Assessment</u>						
% Silt (<0.062 mm)	5		11		1	0
% Sand (0.125 - 2 mm)	13		16		6	1
% Gravel (2 - 64 mm)	18		26		25	50
% Cobble (64 - 256 mm)	47		38		50	46
% Boulder (256 - 2,048 mm)	17		10		18	3
% Bedrock (> 2,048 mm)	0		0		0	0
Median particle size (D50)	97 mm		47 mm		105 mm	62 mm
% Embeddedness (quantitative)	49		46		16	11

Table 1 Footnotes

- ^a 1500 ft downstream of Stout's station, data from PaDEP.
- ^b 800 ft north of the State Forest Boundary off Highway 30, data from PaDEP.
- ^c At the State Forest boundary extending south 328 ft (due to proximity, the same watershed characteristics are reported for the PaDEP and CEC station on Carbaugh Run).
- ^d Metrics in **bold italics** are used to qualify reference stations, which should score optimal (16-20) in each of these categories; **values in red fall below the optimal range**; furthermore, if any of the twelve RBP habitat categories score <10, then the station is disqualified (DEP 391-0300-002, page 32).
- ^e Conductivity/specific conductance sampled March 7, 2016.

Table 2. Antidegradation evaluation for Stout's sample collected from Tom's Creek on March 24, 2016, compared to Pennsylvania Department of Environmental Protection's sample collected from Carbaugh Run on April 8, 2016, Adams County, Pennsylvania.

	Antidegradation Metrics (PADEP 2003)				
	Taxa Richness	Modified EPT Index	Modified Hilsenhoff Index	Percent Dominant Taxon	Percent Modified Mayflies
Reference Value (Carbaugh Run - PADEP - 4/8/2016 Sample)	36	19	2.26	25.7%	55.7%
Candidate Value (Toms Creek - Stout 3/24/2016 Sample)	23	12 ^b	2.09	22.6%	54.3%
Difference	63.9%	63.2%	-0.17	-3.1%	1.4%
Biological Condition Score ^a	2	4	8	8	8
Sum of scores	30				
Percent of Maximum (40)	75%	(must score 92% to qualify as EV)			

Table 2 Footnotes

- ^a Source of metric scoring criteria and Stream Classification Category scoring is PADEP Document 391-0300-002, Water Quality Antidegradation Implementation Guidance, dated November 29, 2003.
- ^b Stout's reported Modified EPT Index metric value was 14; however, this total included all EPT taxa and did not exclude pollution tolerant taxa (*Cheumatopsyche*, PTV = 6, and *Cyrenellus*, PTV = 8) as required per the metric guidelines. The correct value (12) is used for the metric comparison.

Please let me know if you have any questions or concerns regarding the foregoing responses as you review the public comments on the proposed renewal of SGI's NPDES permit for the Pitts Pond system.

Sincerely,



Matthew S. McClure

Director-EHS & Mine Planning
13424 Pennsylvania Ave-Suite 303
Hagerstown, MD 21742
mmcclure@specialtygranules.com
Phone: 301.393.8825
Cell: 276.206.0231
Fax: 301.733.4003