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August 27, 2018

Richard Williams, P.E., P.P., C.M.E.  
Hamilton Township Engineer  
2090 Greenwood Ave.  
Hamilton Township, NJ 08609

RE: **Comprehensive Review No.1**  
Applicant: Synnergy, LLC  
Application No.: (16-05-012)  
Block 1581, Lot 27  
Sweetbriar Avenue  
Hamilton Township, New Jersey

Dear Mr. Williams,

BANC3 has recently received and reviewed the plans entitled “Site Plan of Lot 27 Block 1581 for Synnergy, LLC” for the proposed construction of a Solar Power Array Field on the above referenced property. The project site is located on the south side of Sweetbriar Avenue approximately 900 feet east of Whitehead Road in Hamilton Township, Mercer County, New Jersey, and is otherwise known as **Synnergy, LLC**.

This Comprehensive Review No. 1 will report on the Applicant’s ability to address all Hamilton Township Environmental, Stormwater, and Traffic Ordinances and relevant New Jersey and or Federal regulations and requirements.

The following Reports, Plans, and related documents were utilized during the review of this project:

1. Plan set entitled “Site Plan of Lot 27 Block 1581 for Synergy, LLC” dated March 21, 2016 and last revised March 4, 2018 prepared by Trenton Engineering Co., Inc. consisting of ten (10) sheets.
2. Soil Erosion and Sediment Control Plan dated May 1, 2017 and last revised September 21, 2017 prepared by Trenton Engineering Co., Inc. consisting of three (3) sheets.
3. Plan entitled “Plan Showing Electric Line” dated March 4, 2018 prepared by Trenton Engineering Co., Inc.
4. Phase 1 Environmental Site Assessment/Preliminary Assessment dated February 2016, prepared by TRC Environmental Corp.
5. Stormwater Management Report Sections 1D & 2D DEL-MAR-VA Hydrographs dated April 30, 2016 and last revised September 14, 2017 prepared by Trenton Engineering Co., Inc.
6. Excavation Report Grid Layout Existing and Proposed Flood Plain Volumes Sections ID and 2D dated April 26, 2016 and last revised November 14, 2017 prepared by Trenton Engineering Co., Inc.
7. Soil Test Report for Synnergy, LLC dated January 25, 2018, prepared by Trenton Engineering Co., Inc.

8. Operations and Maintenance Manual for Synnergy, LLC dated January 29, 2018, prepared by Trenton Engineering Co., Inc.
9. NJDEP Permit Approval for FHA and FWW issued February 7, 2018.
10. Estimate for Developer's Bond dated March 14, 2018 prepared by Trenton Engineering Co., Inc.
11. Environmental Impact Statement dated March 29, 2018, prepared by Joseph R. Arsenault, Senior Ecologist; including Addendum dated May 11, 2018.
12. Letter dated June 18, 2018 to Synnergy LLC prepared by Harbor Electric.
13. Letter dated June 20, 2018 to Michael J. Guhanick and Robert C. Poppert, PP, AICP, prepared by Trenton Engineering Co., Inc., concerning the Stream Buffer Conservation Zone.

### Overview of Project

The Applicant is proposing to construct a 4.1 megawatt solar array field to supply electrical power for the Ewing-Lawrence Sewer Authority's treatment plant, located north of Assunpink Creek. The proposed development is located on a vacant 38.3 acre lot, which is currently wooded and contains various associated freshwater wetlands. According to historic sources, the property has supported residential and commercial uses in the past. Farming then surface mining altered the surface landscape into an un-natural series of piles and banks that include extensive disturbed sediments on the west side of the parcel. The proposed solar array is proposed on approximately 12.3 acres of the 38.3 acre tract.

The following is an aerial image of the project site taken from Google.



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**BANC3 Site Plan Review**

The following are specific comments, concerns, and recommendations as it relates to the submitted Site Plans.

1. **The discharge piping from each of the four (4) detention basins range in size from 4” to 6” PEP. The Township Ordinance requires a minimum pipe size of 15”. The smaller pipe sizes could become clogged and required more frequent maintenance. It is recommended that the pipe sizes be increase to meet the Township requirement.**
2. **A profile view should be provided for the Basin #2 outlet piping and scour hole.**
3. **Copies of the plans referenced in the NJDEP flood hazard and wetlands permit should be provided.**
4. **Trash racks should be provide for each headwall within the four (4) proposed basins. The appropriate details for the trash racks should be provided on the plans.**
5. **Soil test locations that correspond with the Soil Test Report should be provided on the plans. It is unclear whether soil tests were performed for Section 2D of the project.**
6. **The Site Plan and emergency spillway detail should be revised to demonstrate that each proposed basin has 1 foot of freeboard above the emergency spillway.**
7. **It appears that the BT/WALL elevations on the profiles should be 36” below the pipe invert to match the concrete headwall detail.**

**BANC3 Stormwater Management Report Review**

The following are specific comments, concerns, and recommendations as it relates to the submitted Site Plans, and Stormwater Management Reports.

1. **The Report should provide a calculation for the predeveloped and post developed CN values used in the stormwater calculations.**
2. **Hydrograph input parameters for the pre and post developed hydrographs should be provided in the calculations. Routing calculations, along with all input parameters, should be provided for each proposed basin.**
3. **The Report includes the Annual Groundwater Recharge Analysis spreadsheet which demonstrates that the proposed change is surface coverage from woods to open space and gravel will not create an annual recharge deficit.**
4. **The Report should be revised to address water quality requirements.**
5. **The proposed basins satisfy the stormwater quantity reduction requirements.**
6. **Calculations should be provided for the proposed emergency spillways.**

**Stormwater Management Regulatory Review**

This section reviews the portions of the Applicants stormwater management system against the requirements outlined in the New Jersey Stormwater Regulations NJAC 7.8 (Rule) and the Hamilton Township Stormwater Ordinance – Chapter 577 (Formerly Chapter 158).

**7:8-1.6 Applicability to Major Development [577-1C] (Formerly 158-1. (c))**

**7:8-5.3 Nonstructural stormwater management strategies [577-4E] (Formerly 158-4. (e))**

**7:8-5.4 Erosion control, groundwater recharge and runoff quantity standards [577-4F] (Formerly 158-4. (f))**

**7:8-5.5 Stormwater runoff quality standards [577-4G] (Formerly 158-4. (g))**

**7:8-5.6 Calculation of stormwater runoff and groundwater recharge [577-5] (Formerly 158-5)**

**7:8-5.7 Standards for structural stormwater management measures [577-6] (Formerly 158-6)**

**7:8-5.8 Maintenance requirements [577-10] (Formerly 158-10)**

This technical review is presented in such a manner that regulation will be cited in *italics*. The citation for the Hamilton Township Ordinance will be in brackets [Chapter / subchapter] following the N.J.A.C. 7:8 citations.

**7:8-1.6 Applicability to Major Development [577-1C - Formerly 158-1. (c)]**

*(a) Except as provided in (b) below, all major development shall comply with the requirements of this chapter.*

**1. BANC3 notes that the definition of “Major Development” per 7:8-1.2 Definitions:**

*“Any development that provides for ultimately disturbing one or more acres of land or increasing impervious surface by one-quarter acre or more. Disturbance for the purpose of this rule is the placement of impervious surface or exposure and / or movement of soil or bedrock or clearing, cutting, or removing of vegetation.”*

**2. BANC3 notes that based on the current submitted Site Plans and the information provided in the Stormwater Management Report, the Applicant will be exposing more than an one acre of soil and thus by definition a “Major Development” and is subject to all requirements of the New Jersey Stormwater Regulations NJAC 7.8 (Rule) and the Hamilton Township Stormwater Ordinance – Chapter 577 (Formerly Chapter 158).**

**7:8-5.3 Nonstructural stormwater management strategies [577-4E – Formerly 158-4. (e)]**

*(a) To the maximum extent practicable, the standards in N.J.A.C. 7:8-5.4 and 5.5 shall be met by incorporating nonstructural stormwater management strategies at N.J.A.C. 7:8- 5.3 into the design.*

*The persons submitting an application for review shall identify the nonstructural strategies incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management strategies identified in (b) below into the design of a particular project, the applicant shall identify the strategy and provide a basis for the contention.*

**1. BANC3 notes the Applicant has included Nonstructural Stormwater Management Strategies within the submitted SWM Report. However, the applicant must also complete and submit the NJDEP “Low Impact Development Model Checklist,” which can be found in the most recent NJDEP BMP Manual.**

**7:8-5.4 Erosion control, groundwater recharge and runoff quantity standards [577-4F – Formerly 158-4. (f)]**

*(a) 1. The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq. and implementing rules.*

**1. A Soil Erosion and Sediment Control Plan has been provided for this project as the proposed disturbance will exceed 5,000 square feet. The plan will require approval from the Mercer County Soil Conservation District.**

*(a) 2. The minimum design and performance standards for groundwater recharge are as follows:*

*i. The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at N.J.A.C. 7:8-5.6, either:*

*(1) Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre- construction groundwater recharge volume for the site*

*(2) Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the two-year storm is infiltrated.*

- 2. The applicant has completed the New Jersey Groundwater Recharge Spreadsheet (NJGRS), which demonstrates that recharge will increase as a result of the proposed development, thereby meeting the regulation requirement.**

*7:8-5.4(a) 3. In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at N.J.A.C 7:8-5.6, complete one of the following:*

*iii: Design stormwater management measures so that the post-construction peak runoff rates for the two, 10 and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed;*

- 3. BANC3 notes that the Applicant has submitted a Stormwater Management Report that demonstrates that the appropriate reductions are achieved for the 2, 10 and 100 year storm events.**

**7:8-5.5 Stormwater runoff quality standards [577-4G – Formerly 158-4. (g)]**

*(a) Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm by 80 percent of the anticipated load from the developed site, expressed as an annual average. Stormwater management measures shall only be required for water quality control if an additional one-quarter acre of impervious surface is being proposed on a development site...The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm.*

- 1. The methods utilized to address the stormwater quality standards should be provided in the Stormwater Management Report.**

**7:8-5.6 Calculation of stormwater runoff and groundwater recharge [577-5 – Formerly 158-5.]**

*(a) Stormwater runoff shall be calculated in accordance with the following:*

- 1. The design engineer shall calculate runoff using one of the following methods:*

*i. The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in Section 4, National Engineering Handbook (NEH-4), dated July 2002, incorporated herein by reference as amended and supplemented. This methodology is additionally described in Technical Release 55 - Urban Hydrology for Small Watersheds (TR-55), dated June 1986, incorporated herein by reference as amended and supplemented.*

- 1. BANC3 notes that the Applicant has selected to use the TR-55 method.**

*(b) Groundwater recharge may be calculated in accordance with the following:*

*1. The New Jersey Geological Survey Report GSR-32 “A Method for Evaluating Groundwater-Recharge Areas in New Jersey”, incorporated herein by reference as amended and supplemented.*

- 2. BANC3 notes that the Applicant has in general complied with this requirement based on the submitted New Jersey Groundwater Recharge Spreadsheet (NJGRS).**

**7:8-5.7 Standards for structural stormwater management measures [577-6 – Formerly 158-6.]**

*(a) Standards for structural stormwater management measures are as follows:*

*1. Structural stormwater management measures shall be designed to take into account the existing site conditions, including, for example, environmentally critical areas; wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).*

- 1. BANC3 notes that the Applicant has in general complied with this requirement.**

*2. Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning.*

- 2. BANC3 recommends that the diameter of the outflow piping for each basin be increased to 15” to minimize maintenance of this piping.**

*3. Structural stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant.*

- 3. BANC3 notes that the Applicant has in general complied with this requirement.**

**7:8-5.8 Maintenance requirements [577-10 – Formerly 158-10.]**

*(a) The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.*

*(b) The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). Maintenance guidelines for stormwater management measures are available in the NJ Stormwater BMP Manual.*

- 1. BANC3 notes that an Operations and Maintenance Manual has been submitted for the proposed stormwater management facilities. The manual shall be revised to include inspection log sheets for use during the scheduled inspections.**

- 2. The proposed Maintenance Manual shall be recorded at the County Clerk’s Office.**

**Section 550-113 (Formerly 160-113) Stormwater Management (Township Ordinance Requirements)**

*B.(3) Drainage structures which are proposed to be located on state or county highway right-of-way shall be approved by the state or county highway engineer’s office. Any drainage structures within wetlands or resulting in stream encroachments shall be submitted to the New Jersey Department of Environmental Protection, and a letter from that office shall be directed to the administrative officer prior to final approval or any construction.*

- 1. Freshwater Wetlands (FWW) and Flood Hazard Area (FHA) permits have been approved by the NJDEP for the project as development is proposed in regulated areas.**

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**2. The NJDEP Permit Approval Letter shall be recorded at the County Clerk’s Office.****BANC3 Environmental Review**

*Chapter 530, Section 530-3A (Formerly Chapter 154, Section 154-3(a)) In the review of an applicant’s plan, the administrative officer shall consider the potential adverse and positive environmental impacts of any proposed project as major factors in its findings. An environmental impact statement will be required of the applicant if it is determined by the administrative officer and affirmed by the reviewing board that there may be adverse environmental impacts associated with the plan as submitted, which require further analysis.*

- 1. The project site contains Stream Buffer Conservation Zones (SBCZ) as defined by section 583 of the Township Ordinance. The required stream conservation zone will be Class 2 as they are associated with C2 waters. The Ordinance requires a 75 foot conservation zone from the top of each bank at bank full flow OR maximum pool elevation OR the centerline of intermittent streams OR the one-hundred-year floodplain, whichever is greater. The plans should be revised to indicate that the SBCZ is 75 feet from the one-hundred-year floodplain instead of the top of bank. BANC3 notes that a significant portion of the project will be located within the SBCZ when it is measured from the floodplain limit as required by the Ordinance.**
- 2. Stream Buffer Conservation Zones shall remain in a natural condition or, if in a disturbed condition, including agricultural activities, at the time of adoption of this chapter, may be restored to a natural condition. There shall be no clearing or cutting of trees and brush, except for removal of dead vegetation and pruning for reasons of public safety or for the replacement of invasive species with indigenous species. The Applicant is proposing to clear a significant amount of trees from the SBCZ as part of this project.**
- 3. All new major site plans shall be designed to provide sufficient areas outside of the SBCZ to accommodate primary structures, any normal accessory uses appurtenant thereto, as well as planned lawn areas. Portions of lots within the SBCZ must be permanently restricted by deed or conservation easement held by the Township to prevent clearing of vegetation within the SBCZ.**
- 4. Within the SBCZ, no construction, development, use, activity or encroachment shall be permitted unless the effects of such development are accompanied by preparation, approval and implementation of a stream buffer management plan.**
- 5. BANC3 notes that an Environmental Impact Statement (EIS) and a May 2018 Addendum have been submitted by the Applicant. The EIS stated that the solar facility will be unmanned and requires no water service, sanitary facilities or on-site trash collection. Any trash or waste carried into the facility would be removed by the contractors or operators.**
- 6. The EIS acknowledges that the major negative impact of the proposed development will be the removal of approximately 820 large trees, an unknown amount of smaller trees, shrubs and underbrush. This loss of upland forest will remove canopy and sub-canopy habitat for resident and migratory fauna. It will eliminate nesting sites for native residents and summer passerine avian species. The loss will also eliminate 12 acres of roosting habitat for regional and migratory raptors. Resident reptiles and amphibians would lose foraging and hibernating locations. Insect community complexity would change to species tolerant of open, un-forested environments.**
- 7. The positive impacts provided in the EIS include the elimination of measurable quantities of carbon dioxide and gases emitted from conventional power sources. The proposed solar facility will provide power generation in close proximity to the final user which could reduce impacts**

associated with more remote site locations.

8. **The Phase I Environmental Site Assessment/Preliminary Assessment identifies two (2) Recognized Environmental Conditions (RECs) at the project site. The first is an unidentified dried black material along the southern portion of the site. The second is a large open pond located along the southern edge of the site at the end of the un-named stream. The report notes that the potential exists, at both locations, for material to contain compounds identified as a regulated material or hazardous substance. The report states that remediation and/or subsurface investigations are necessary to address the 2 RECs.**

**BANC3 Traffic / Circulation Review**

1. **BANC3 notes that the solar facility will be unmanned and that traffic to and from the facility would be minimal. It is not anticipated that the proposed development would have any impact on the adjacent roadways.**
2. **It is recommended that a paved or concrete apron be provided at each proposed site driveway to keep stones from getting onto the roadway. This apron will also provide traction for vehicles attempting to exit the site and merge with oncoming traffic.**
3. **The sight triangle for each proposed driveway should start a minimum of 14.5 feet back from the edge of road in accordance with AASHTO standards.**
4. **Additional maneuvering area may be required for vehicles exiting the proposed parking spaces.**
5. **The plans should note that existing vegetation shall be removed as necessary within the proposed sight triangles for each driveway.**
6. **Sweetbriar Avenue is listed as a minor arterial road on the Township Master Plan with a minimum right-of-way width of 80 feet. The existing right-of-way in the vicinity of the project is 50 feet. Sweetbriar Avenue is a County roadway under the jurisdiction of Mercer County.**

Please contact me at 609-436-5800 x 236 if you would like to further discuss this review.

Sincerely,



Jeffrey S. Richter, PE, PP