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March 27, 2017

Radnor Township Commissioners
Radnor Township Administration

Ref; CH2M Stormwater Presentation March 13, 2017

Dear Commissioners and Township Supervisors,

We, Radnor Township, have contracted with many consulting engineering companies over the last 45 + years including; Pinnoni Associates, Chagrin Valley Engineering, Gannett Fleming, and the latest being CH2M and T&M Associates for stormwater control. We have little to show for the expenditure of hundreds of thousands of dollars. Thankfully we still have the North Wayne Field detention basin.

On March 13th we anticipated CH2M would present a new, clear road map for our various problem sites. What a disappointment! We received 60 pages of charts and graphs with incomprehensible prioritization, weighting and ranking, listing 32 potential projects for projects costing **\$20,730,000** to **\$32,530,000**. Yes! **\$20,730,000** for the watered-down version to **\$32,530,000** for the gold-plated version. How much money does the Stormwater Management Fee bring in yearly? How do they propose we pay for this? These projects, other than Green Streets proposals, are not new nor enlightening other than their way of ranking and cost estimates. There wasn't a coherent narrative or specific "project" recommendations.

This is not a restaurant menu. We don't order "1" from column "A" and "2" from column "B". Stormwater projects must be defined as systems, starting with a predominate stream and a goal. Good engineering requires clearly defining the problem, examining all aspects of each component, exploring all options, formulating a coherent plan, designing the elements needed, and reexamining every aspect, before proposing a plan leading to the goal. Commissioners being asked for authorization and the taxpayers being told to pay for it, must be able to relate to the project and areas being discussed and understand each element and rationale for each proposal before being asked for final approval.

Facts: We have four discrete flood prone creeks in the township, Gulph Creek, Ithan Creek, Darby Creek and Meadowbrook Run. Each has its own characteristics and problems. Each must be treated separately. Commingling the data presented on March 13th is counterproductive. It affronts the recipient and creates confusion in interpreting and making use of the data.

Several page headings of the CH2M report contain the phrase "**Storage Volume Only**". Such statements have little or no relevance where no values are provided. "Storage Volume" could mean anything from a bucket full to a lake. Using it in their "Scoring" muddies the water.

In their "scientific" evaluation of projects, they rank the **Radnor Trail, (J/K-6)** for a 1,200 ft. trench, and **West Ave. (I-3)**, (100 yards long), for a **Green Street**, totaling **\$1,120,000**, ahead of flooding on **(A-3) South Wayne Avenue at the Fire House** or **Gulph Creek** flooding in **North Wayne**, both of which are significant public safety issues.

CH2M's Priority Projects: I am sure you all have your own questions or suggestions regarding their identified projects and the ranking of same. A few of my own are listed below. Missing from the **High Priority** list – a Public Safety matter, with a low cost to remedy is on **Chamounix Rd**. See below.

1. **A-3 (\$220,000) South Wayne Ave - Inlets** New Inlets on Wayne avenue to allow efficient connection to the RMS stormwater system. The picture, A-10, indicates a connection to the unused, 10 year old detention system under the RMS athletic fields. If this is the case, have they determined how to make connection? It has been reported that the utilities buried in that area make it extremely difficult (expensive) to connect to that system. Will the RSB, owners of the property, agree to disrupting portions of the field to accomplish this. The detention system was designed for the input from the western side and discharge on the eastern side. The marked-up photos indicate both input and discharge on the eastern side. Can this system function in this configuration? Doubtful. Considering the length of pipe required and expense for repairing the field after construction, the projected cost is likely to be off by a factor of two or three even if it can function as designed. Because of the relatively flatness of the terrain it might require a pumping station to convey the water to the detention field. Another significant cost!
2. **A-6 (\$570,000) AT&T lot on Lancaster Ave - Infiltration**. There is a Park running the full 120 yd. length. Cost to change it into a "**Green Street**" of \$4,750 per yd.. This lovely park is leased by the township. It seems that this might be classified as a completed "Green Street" project.
3. **I-1 (\$3,770,000) NWF - "New Option"**. I think this project is poorly conceived and engineered. The project description also omitted the need for a new large diameter storm sewer to take discharge to Gulph Creek. This will probably add another \$400,000 or more bring the total to over **\$4,100,000. Outrageous!** Constructing a large storm sewer (what size) from Eagle Rd. to NWF does nothing to alleviate the flooding on Forest Rd. while necessitating the complete reconstruction of NWF.
4. **I-3 (\$510,000) West Ave - Green Street**. West Ave. Bellevue to Francis. REALLY, **\$510,000**. A distance of less than 105 yd. 25 yd. of which are driveways, leaving 80 yd. of Green Street. Cost of **\$6,375** per yard. A bit expensive. With the proposed construction of an underground retention basin at Francis and Banbury, near the WAWA, any water not captured here will be captured a block away.
5. **I-4 (\$4,880,000) Cowan Park - Underground Infiltration Storage** Constructing an underground detention field in Cowan Field and connecting it to Gulph Creek by a large diameter storm sewer down Poplar Ave. is another poorly conceived engineering project. Upstream creek control is far superior, more efficient and less expensive answer. In addition, any underground system needs ongoing maintenance. This might entail tearing up all or part of the field several times in the future. Think **\$250,000 +** per occurrence.
6. **I-13 (\$600,000) Wayne Train Station - Detention** Is this for both sides of the tracks or the South side only? Sounds like a lot of money to dig a trench in a parking lot. What are the design parameters? Is this an infiltration system or will it have a controlled discharge to Gulph Creek? If it is infiltration, are you certain that this will not cause basement flood in on Louella Court or the North side of Pennsylvania Ave.?
7. **J/K-7 (\$620,000) Farmers Market - Detention** ~~What are the projected reduction in flow into~~ The West Wayne Preserve (J/K-2), Radnor Trail (J/K-6) or other locations during a 10, 15 or 50 year storms? These both appear to be down-stream areas of the Farmers Market. How much water do you expect to capture? If it is "detention", how and where will you discharge it?
8. **J/K-6 (\$610,000) Radnor Trail - Infiltration** Trench under Radnor Trail approx. 1200 ft. A questionable project. **\$1,525** per yd. Where does this water presently go? Does it cause significant problems? If the trail is "shut down" during a significant storm, how many people are impacted and for what period of time?

Priority Project Omitted from CH2M report:

Chamounix Rd. Public Safety The area where Gulph Creek flows under Chamounix Rd. is a site of frequent flooding. The two conduits running under Chamounix road and the stream bed leading to them should be cleared. If the conduits show deterioration they should be lined with galvanized pipe and grouted.

These conduits discharge to an 8 ft. wide channel, approx. 50 yd. long, east of Chamounix Rd. The eastern end of the channel has a headwall with a weir to regulate flow and maintain depth. This channel provides input into Fennimore Pond. It might be appropriate to reduce the height of the headwall to reduce the Creek level by a couple of inches west of the conduits thus allowing increased flow during storms. Inches during normal weather can mean feet during a storm.

A new bridge was constructed over the tributary from VFMA East Campus 42 yd. north of that area. Replacement of the original bridge was unrelated to flooding. Flooding that occurred at the old bridge was the result of flooding of Gulph Creek at the above-mentioned conduits and stormwater flowing down Chamounix being contained by curbing.

Criteria for each priority area should be evaluated and ranked by;

1. Public safety.
2. The severity the existing problem and potential damage and/or injury.
3. The number of residents and/or properties affected.
4. Will the proposed project eliminate or substantially reduce flooding and enhance public safety during a 25 year storm, and hopefully 50 and 100 year storms?
5. Is the project feasible?
6. What is the projected cost?
7. Can the project be done in stages, spreading out cost? If YES, define each stage and the sequence of construction. Can each stage function independently until the next stage(s) can be completed?

Gulph Creek is the clearly defined in terms of water sources, flow and flooding history. It is best understood by breaking it down into discreet segments.

1. The headwaters are in Tredyffrin Twp. near the Stafford Park and Library. It enters Radnor Twp. east of Beechtree Ln. above Forest Rd. and flows southeasterly toward Eagle Rd.
2. A tributary, originating near the VFMA athletic fields and the Church of the Savior, flows under North Wayne Ave. at Crestline Rd. From there it flows southerly entering Radnor Twp. west of North Wayne Ave. eventually joining Gulph Creek above Eagle Rd. Some of its drainage comes from the west side of St. Davids Golf Club. The Church of the Savior has constructed an extensive stormwater control system on their property, including a very large detention basin capable of retaining several acre feet of runoff. This system greatly reduces the peak flow in this tributary during and after large storms. Without this system Gulph Creek would be much more difficult and expensive to control. This system was constructed by the Church of the Savior at their own expense.
3. Eagle Rd. to Poplar Ave flows thru a man-made channel.
4. Poplar Ave. to Radnor Street Road, (Cowan Park and Willow Street area).
5. The drainage from AT&T properties on, West Ave. and the area on West Ave past Eagle Rd. south of the railroad (55 Acres), flows under the tracks and into the NWF detention basin and discharges into Gulph Creek south of Poplar Ave. behind John's Market.
6. Radnor Street Road (Cowan Park) into Fennimore Woods.
7. A minor tributary, originating on the southeast side of St Davids Golf Club, flows thru VFMA East Campus and merges with Gulph Creek in Fennimore Woods about 50 yd. east of Chamounix Rd.
8. From Fennimore Woods, it flows around Fennimore Pond and through Eastern University to Upper Merion Township at County Line Rd. and on to the Schuylkill River. There are several "low impact" tributaries from Cabrini College, Eastern University and other locations east of King of Prussia Rd. to County Line Road where it flows into Upper Merion Twp.

Commissioners and fellow citizens, the township has conducted survey after survey spending hundreds of thousands of dollars to solve this stormwater problem. We know where the problem areas are. We don't need another survey to inform us. We know what needs to be done. It is time to go out for quotes from reliable contractors, using their expertise and experience to arrive at a reasonable contract. Let's make sensible cost-efficient decisions going forward.

The writer has in-depth familiarity with Gulph Creek. "Taming the Creek", reducing the potential for flooding, requires creative thinking and sound engineering. As noted, I believe the CH2N proposals, (I-1) and (I-4) n, for North Wayne are; poorly conceived, engineered, lacking in creativity and extremely expensive. They will not resolve the Forest Rd. flooding problem.

I have developed alternate concept for the North Wayne Area, that will eliminate flooding for 5 yr. and 10 yr. storms. Potential, 50 and 100 year storms year storms will also be contained or greatly reduced. Cost will be a fraction of CH2M's NWF (I-1) (New Option) and (I-4) Cowan Park proposals projected to cost of \$8,570,000. Furthermore, it does not require tearing up both NWF and Cowan Park, Poplar Ave. and Bellevue Ave. As I said at the start, fortunately we have the existing North Wayne field basin.

This will require the use of some private property. I am confident that we will find little resistance. Some property owners may find the envisioned changes will enhance their property values. Some compensation might be required but it is unlikely that we would need to invoke eminent domain.

I am available to discuss my proposals with the Commissioners and Administration. I will need a Non-Disclosure Agreement to protect my intellectual property. As a graduate engineer with years of experience in various engineering fields I have full confidence in my design. I have invested countless hours on this. My primary concern is and has always been public safety, cost effective design, eliminating flooding where possible, and the betterment of our community.

Sincerely



James E. (Jim) Giegerich. ME

CH2M March 13-2017 Report

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ID #	P-6	P-7	Index ID / Location	With 100% Green Street Option and NWF New Option	Totals for each Section Full Options	Without NWF New Option and 100% Green Street	Totals Each Section - Reduced Options	
	FRSV-1	APC-1	Central Wayne Business - Ithan Creek					
A-1	26	30	Runnymede	\$640,000		\$640,000		
A-2	28	27	S. Wayne Parking Lot	\$1,720,000		\$1,720,000		
A-3	3	6	S. Wayne Ave Inlets	\$220,000		\$220,000		
A-8	25	25	AT&T (Bellvue)	\$570,000	\$3,150,000	\$570,000	\$3,150,000	
			East Central Wayne Business - Ithan Creek					
B-1	13	22	Vetrans Park	\$780,000		\$780,000		
B-4	23	26	G-St. Louella to Aberdeen	\$960,000		\$960,000		
B-6	32	32	Iven Ave (culverts)	\$450,000		\$450,000		
B-7	19	28	Wayne Square	\$650,000		\$650,000		
B-8-a	29	17	Green Streets (50%)			\$750,000		
B-8-b	30	18	Green Streets (100%)	\$1,490,000	\$4,330,000		\$3,590,000	
			North Wayne - Gulph Creek					
I-1	11	23	NWF (new option)	\$3,770,000				
I-13	5	16	Wayne Train Station	\$600,000		\$600,000		
I-14	2	24	NWF option (E)			\$990,000		
I-3	4	2	West Ave - Green St.	\$510,000		\$510,000		
I-4	12	21	Cowan Park Storm Sewer / Underground Detention	\$4,800,000	\$8,570,000	\$4,880,000		
I-8-a	20	7	Green Streets (50%)			\$640,000		
I-8-b	24	9	Green Streets (100%)	\$1,280,000	\$11,040,000		\$7,920,000	
			West Central Wayne - Darby Creek					
J/K-1	16	10	Connor/Filipone Park	\$1,710,000		\$1,710,000	\$1,710,000	
J/K-2	17	12	West Wayne Preserve	\$710,000		\$710,000		
J/K-6	1	1	Radnor Trail	\$610,000		\$610,000		
J/K-7	10	29	Farmers Market	\$620,000	\$3,650,000	\$620,000	\$3,650,000	
			Eastern Radnor Twp. - Meadowbrook Creek					
T-1-a	31	19	Green Streets (50%)			\$250,000		
T-1-b	27	15	Green Streets (100%)	\$500,000				
T-2-a	15	4	Fairfax Rd. (50%)			\$100,000		
T-2-b	18	8	Fairfax Rd. (100%)	\$200,000		\$200,000		
T-3-a	7	5	Residential (10%)			\$160,000		
T-3-b	8	11	Residential (100%)	\$1,580,000	\$2,280,000		\$710,000	
			Eastern Radnor Twp. Meadowbrook Creek					
U-1A	21	14	Radnor Houst Apts.	\$910,000		\$910,000		
U-3	6	3	Montrose Condos	\$80,000		\$80,000		
U-7-a	9	13	Residential (10%)			\$180,000		
U-7-b	14	20	Residential (100%)	\$1,770,000				
U-8	22	31	Homes (Brynn Mawr)	\$1,390,000	\$4,150,000		\$1,170,000	
			Totals		\$32,530,000		\$20,730,000	